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SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

MARK ONE

[X] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

FOR THE FISCAL YEAR ENDED DECEMBER 31, 1998

OR

[ ] TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

FOR THE TRANSITION PERIOD FROM _____ TO _____ .

COMMISSION FILE NO. 0-20720

LIGAND PHARMACEUTICALS INCORPORATED
(EXACT NAME OF REGISTRANT AS SPECIFIED IN ITS CHARTER)

<TABLE>
<S> <C>

DELAWARE	77-0160744
(STATE OR OTHER JURISDICTION OF INCORPORATION OR ORGANIZATION)	(IRS EMPLOYER IDENTIFICATION NO.)
10275 SCIENCE CENTER DRIVE SAN DIEGO, CA	92121-1117 (ZIP CODE)
(ADDRESS OF PRINCIPAL EXECUTIVE OFFICES)	

</TABLE>

REGISTRANT'S TELEPHONE NUMBER, INCLUDING AREA CODE: (619) 550-7500

SECURITIES REGISTERED PURSUANT TO SECTION 12(b) OF THE ACT:
NONE

SECURITIES REGISTERED PURSUANT TO SECTION 12(g) OF THE ACT:
COMMON STOCK, $.001 PAR VALUE

WARRANTS TO PURCHASE ONE SHARE OF COMMON STOCK, $.001 PAR VALUE

PREFERRED SHARE PURCHASE RIGHTS
(TITLE OF CLASS)

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes [X] No [ ]

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. [ ]

The aggregate market value of the Registrant's voting stock held by non-affiliates as of February 28, 1999 was $448,563,405. For purposes of this calculation, shares of Common Stock held by directors, officers and 5% stockholders known to the Registrant have been deemed to be owned by affiliates which should not be construed to indicate that any such person possesses the power, direct or indirect, to direct or cause the direction of the management or policies of the Registrant or that such person is controlled by or under common control with the Registrant.

As of February 28, 1999 the registrant had 46,151,837 shares of Common Stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Proxy Statement to be filed not later than 120 days after December 31, 1998, in connection with the Registrant's 1999 Annual Meeting of Stockholders, referred to herein as the "Proxy Statement," are incorporated by reference into Part III of this Form 10-K. Certain exhibits filed with the Registrant's prior registration statements and period reports under the Securities Exchange Act of 1934 are incorporated herein by reference into Part IV of this Report.

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PART 1

ITEM 1. BUSINESS

The discussion of the Company's business contained in this annual report on form 10-K may contain certain projections, estimates and other forward-looking statements that involve a number of risks and uncertainties, including those discussed below at "Risks and Uncertainties." While this outlook represents management's current judgment on the future direction of the business, such risks and uncertainties could cause actual results to differ materially from any future performance suggested below. The Company undertakes no obligation to release publicly the results of any revisions to these forward-looking statements to reflect events or circumstances arising after the date of this annual report.

The Company's trademarks, trade names and service marks referenced in this annual report include ONTAK(TM), Panretin(R) and Targretin(R). Each other trademark, trade name or service mark appearing in this annual report belongs to its holder.

References to Ligand Pharmaceuticals Incorporated ("Ligand" or the "Company") include its wholly owned subsidiaries -- Glycomed Incorporated; Ligand (Canada) Incorporated; Ligand Pharmaceuticals International, Incorporated; Marathon Biopharmaceuticals, Incorporated; and Seragen, Incorporated.

OVERVIEW

Ligand's goal is to build a profitable pharmaceutical company which discovers, develops and markets new drugs that address critical unmet medical needs of patients in the areas of cancer, men's and women's health and skin diseases, as well as osteoporosis, metabolic, cardiovascular and inflammatory diseases. The Company strives to develop drugs that are more effective and/or safer than existing therapies and that are more convenient (taken orally or topically administered) and cost effective. Ligand pursues the discovery, development, approval and marketing of new drugs through internal and collaborative research and development programs, and through the licensing or acquisition of late-stage development products. Internal and collaborative programs utilize Ligand's proprietary science technology. (See "Technology.") In-licensing and acquisition programs focus on products which have near-term prospects of FDA approval, and which can be marketed by a small specialty cancer and HIV-center sales force.

In February 1999, the Company was granted United States ("U.S.") Food and Drug Administration ("FDA") marketing approval for its first two products -- Panretin(R) gel for the topical treatment of cutaneous AIDS-related Kaposi's sarcoma ("KS") and ONTAK(TM) for the treatment of patients with persistent or recurrent cutaneous T-cell lymphoma ("CTCL") whose malignant cells express the CD25 component of the Interleukin-2 ("IL-2") receptor. In late 1998 and early 1999, Ligand assembled a 26-member specialty oncology and HIV-center sales force in the U.S. to launch Panretin(R) gel and ONTAK(TM) in the U.S. In addition, the Company established a subsidiary, Ligand Pharmaceuticals International, Inc., with a branch in London, England to manage its European operations. A Canadian sales force, which has been in place since 1995, currently markets two in-licensed cancer products in Canada.

Ligand's drug discovery and development programs are based on its leadership position in gene transcription technology. Ligand's proprietary technologies involve two natural mechanisms that regulate gene activity: (1) non-peptide hormone activated Intracellular Receptors ("IRs") and (2) cytokine and growth factor activated Signal Transducers and Activators of Transcription ("STATs"). (See "Technology.") Ligand applies IR technology to the discovery and development of small molecule drugs to enhance therapeutic and safety profiles and to address unmet patient needs in certain cancers, men's and women's health, skin diseases, osteoporosis, cardiovascular and metabolic diseases, and inflammatory disorders. Similarly, STATs influence many biological processes, including those associated with cancer, other metabolic diseases, and inflammation and blood cell formation. Through its acquisition of Seragen Incorporated ("Seragen") in August 1998 and Glycomed Incorporated ("Glycomed") in May 1995, Ligand also has proprietary technology in fusion proteins and complex carbohydrates. (See "Strategic Transactions" and "Inflammatory Disease.") Fusion protein technology was used in the development of ONTAK(TM).

Ligand uses an innovative combination of internal and collaborative programs to develop and market potential drugs. Ligand has 25 compounds in various stages of internal development. (See "Ligand Products in Clinical Development" and "Ligand Research and Development Programs.") Targretin(R) capsules and Targretin(R) gel are in late-stage human testing for treatment of patients with CTCL. Targretin(R) gel is in earlier-stage human testing for the treatment of actinic keratoses and skin cancer. Targretin(R) capsules are in early-stage human testing for the treatment of patients with breast cancer, psoriasis and diabetes. Other internal programs include the post-marketing trials for ONTAK(TM), which the FDA required in connection with its accelerated approval. A Phase II trial for ONTAK(TM) is ongoing in the treatment of psoriasis. Ligand's compound LGD1550 is in early-stage human testing for the treatment of patients with advanced cancer. Ligand has established several corporate collaborations, with 23 compounds in development, which may generate future royalty-based revenue. The table below highlights the Company's collaborations to date:

<TABLE>
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CORPORATE COLLABORATOR	INITIATION OF COLLABORATION	DISEASE/INDICATION
<S>	<C>	<C>
Eli Lilly and Company	November 1997	Metabolic and cardiovascular diseases
SmithKline Beecham Corporation	February 1995	Oncological uses, anemia
Wyeth-Ayerst, the pharmaceutical division of American Home Products	September 1994	Osteoporosis, breast cancer, oral contraception, endometriosis, uterine fibroids, hormone replacement therapy
Abbott Laboratories	July 1994	Rheumatoid arthritis, inflammatory bowel disease, asthma, dermatitis
Sankyo Company, Ltd.	June 1994	Inflammation
Glaxo-Wellcome plc	September 1992	Atherosclerosis and other cardiovascular diseases
Allergan, Inc.	June 1992	Type II diabetes, skin disorders
Pfizer Inc.	May 1991	Osteoporosis

</TABLE>

Ligand also seeks to in-license and/or acquire cancer and other medical specialty drugs, which are in late-stage clinical development or have been approved by regulatory authorities. During 1998, Ligand acquired ONTAK(TM), a treatment for CTCL, in its acquisition of Seragen and in-licensed rights in the U.S. and Canada to Morphelan(TM) from Elan Corporation, plc ("Elan"). Morphelan(TM), a once-daily, oral, sustained-release product for the management of pain in oncology and HIV patients, is in Phase III clinical trials in the U.S. (See "Strategic Transactions.")

STRATEGY

Business Strategy. The Company's strategic goals are to build a marketing and sales presence in the U.S., Canada and Western Europe, focus on initial regulatory approval for smaller indications that bring products to market quickly, expand the markets for its products through additional indication approvals, and license or acquire technology and/or products in advanced stages of development. Ligand's internal efforts have been focused primarily on the discovery and development of retinoids, sex steroid receptor agonists and antagonists and cytokine agonists for use in specialty market applications, principally cancer, gynecological disorders and male hormonal imbalances. An outgrowth of this research has led to a development program in cardiovascular and metabolic disease. Ligand has developed a cancer product pipeline that includes two products marketed in the U.S., two in-licensed products marketed in Canada, and four late-stage products nearing NDA submission.

Ligand has entered into research and development collaborations with major pharmaceutical companies, with the goal of building a future royalty-based business. Ligand's collaborative programs focus on discovering drugs for certain cardiovascular, inflammatory, metabolic and other diseases, as well as broad applications for women's and men's health. (See "Corporate Collaborations.") Ligand believes its collaborators have the resources, including clinical and regulatory experience, manufacturing capabilities and marketing infrastructure, needed to develop and commercialize drugs for these markets. The arrangements generally provide for collaborative discovery programs funded largely by the corporate partners aimed at discovering

new therapies for diseases treated by primary care physicians. In general, drugs resulting from these collaborations will be developed, manufactured and marketed by the corporate partners. Ligand's collaborative agreements provide for research revenue during the drug discovery stage, milestone revenue for compounds successfully moving through clinical development, and royalty revenue from the sale of drugs developed through collaborative efforts.

Ligand also seeks to in-license products from other companies that provide a strategic fit with the Company's product portfolio. Products in-licensed by the Company to date are Morphelan(TM), PHOTOFRIN(R), and Proleukin(R). (See "Elan Strategic Alliance" and "Marketed Products.")

Sales and Marketing. Ligand's sales strategy is to create a targeted sales force specializing in cancer, to sell its products and those it in-licenses. In 1998 and early 1999, Ligand created a 26-member U.S.-based specialty cancer sales force. The team includes two national account managers, four regional managers, and 20 senior cancer sales specialists. To further support the launch of the Company's first two cancer products, Ligand recently established a Medical Science Liaison Group to work closely with clinical investigators and the specialty cancer sales force to coordinate post-marketing clinical trials. Ligand services its Canadian sales through a Canadian cancer sales team. In early 1999, the Company laid the groundwork for global commercialization with the initiation of European operations through its subsidiary, Ligand Pharmaceuticals International, Inc. For a discussion of the risks associated with sales and marketing see "Risks and Uncertainties."

Technology. Ligand uses three proprietary technologies in its current internal product development, IRs and STATs and fusion proteins. Ligand's drug discovery and development programs have established a leadership position in gene transcription technology through proprietary technologies involving two natural mechanisms that regulate gene activity: (1) non-peptide hormone-activated IRs and (2) cytokine and growth factor activated STATs. Ligand applies IR technology to the discovery and development of small molecule drugs that address unmet patient needs and enhance the therapeutic and safety profiles of marketed medications in certain cancers, men's and women's health, skin diseases, osteoporosis, cardiovascular and metabolic diseases, and inflammatory disorders. STAT technology is being used to discover new treatments for diseases such as cancer, metabolic diseases, inflammation and blood cell formation. The recently acquired fusion protein technology has led to the discovery of a number of molecules developed by Seragen, a wholly owned subsidiary of Ligand. Potential indications for this technology include the treatment of cancers including CTCL, autoimmune diseases such as rheumatoid arthritis, psoriasis, and HIV infection/AIDS. ONTAK(TM), approved in 1999 for the treatment of patients with persistent or recurrent cutaneous CTCL whose malignant cells express the CD25 component of the IL-2 receptor, was developed using fusion protein

technology.

Currently, Ligand has five retinoid products in its cancer pipeline, Panretin(R) gel, Panretin(R) capsules, Targretin(R) gel, Targretin(R) capsules and LGD1550, all of which were developed using IR technology. (See "Technology.") Retinoids may offer important clinical advantages over currently available cancer therapies by triggering natural mechanisms to halt or reverse the progress of various forms of cancer. Retinoids selectively target cells that express retinoid receptors. Accordingly, they offer potentially less toxic side effect profiles compared to some chemotherapeutic agents, which kill rapidly growing cells, cancerous or not. IR technology was instrumental in the development of Ligand's first approved product by the FDA in early 1999, Panretin(R) gel.

Ligand also in-licenses technologies to pursue the development of its core technologies. As such, when a drug is discovered at Ligand, the Company may be obligated to pay milestone payments, royalties, and/or license fees under the terms of certain agreements. Ligand has entered into licensing agreements with Baylor College of Medicine ("Baylor"), The Salk Institute of Biological Studies ("Salk Institute"), and Rockefeller University ("Rockefeller") for certain rights to IR and STAT technologies. (See "Academic Collaborations.")

STRATEGIC TRANSACTIONS

In 1998, Ligand acquired rights to ONTAK() through the acquisition of Seragen and the concurrent execution of related agreements with Lilly. Also in 1998, Ligand in-licensed Morphelan() from Elan, a late-stage development product for the management of pain in cancer and HIV patients.

<TABLE>
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COMPANY NAME	PRODUCT	DISEASE/INDICATION	STATUS	MARKETING RIGHTS
<S>	<C>	<C>	<C>	
Elan	Morphelan(TM)	Pain management in HIV/Cancer	Phase III (co-promotion option)	U.S., Canada; Europe
Seragen	ONTAK(TM)	CTCL	Marketed in U.S.	Worldwide

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Elan Strategic Alliance. In September 1998, the Company and Elan signed a binding letter of agreement and in November 1998 signed definitive documents for a strategic alliance, which provides Ligand with financing through December 31, 1999 of up to $130.0 million. As of December 31, 1998, Elan had provided approximately $60.0 million of the potential $130.0 million in financing.

$50.0 million of the $60.0 million in financing was provided by Elan through the purchase of approximately $20.0 million of the Company's common stock (1,716,738 shares, valued at $11.65 per share) in two installments and $30.0 million in issue price of zero coupon convertible senior notes due 2008 with an 8.0% per annum yield to maturity. Interest will accrue during the term of the notes. The remaining available notes may be used to finance the final payments for the Seragen merger due in August 1999, as well as other acquisitions of complementary technologies, subject to the consent of Elan.

In conjunction with the strategic alliance, Elan licensed to Ligand exclusive rights to market Elan's proprietary product Morphelan(TM) in the U.S. and Canada for pain management in cancer and HIV patients. Ligand also has an option to co-promote Morphelan(TM) in continental Europe for the same indications. Morphelan(TM), a once-daily, oral capsule form of morphine, may provide sustained pain management for HIV and cancer patients as compared to current therapies requiring frequent dosage treatment. Morphelan(TM) is currently in Phase III clinical trials in the U.S. Ligand can market and sell Morphelan(TM), if approved, through its existing specialty cancer and HIV-center sales force.

Under the license agreement, Ligand paid Elan $15.0 million, in the form of $5.0 million of common stock (429,185 shares, valued at $11.65 per share) and $10.0 million in notes (a portion of the $60.0 million of financing provided to date). The $15.0 million consideration was written off in 1998 as in-process

technology as a one-time charge to results of operations. Milestone payments will be made based upon the occurrence of certain events up to and including the approval of the NDA in the U.S. Payment may be in cash or, subject to certain conditions, in common stock or notes.

Seragen. In May 1998, Ligand announced an agreement to acquire Seragen; Seragen became a wholly owned subsidiary of Ligand in August 1998. In August 1998, Seragen signed an agreement with Ligand and Lilly in which Lilly assigned its rights and obligations with Seragen to Ligand, including its sales and marketing rights to ONTAK(TM). (See "Marketed Products.") Under the terms of the merger agreement, Ligand paid merger consideration at closing of $30.0 million, $4.0 million in cash and $26.0 million in the form of the Company's common stock (1,858,515 shares, valued at $13.99 per share). The merger agreement required an additional $37.0 million to be paid, at the Company's option in cash and/or common stock, six months after the date of receipt of final FDA clearance to market ONTAK(TM). In February 1999, the FDA approved ONTAK(TM) with certain post-marketing requirements. Under the Company's agreement with Lilly, Ligand paid $5.0 million (434,546 shares, valued at $11.51 per share) in March 1999 in the form of common stock as a milestone payment to Lilly as a result of the FDA's marketing approval for ONTAK(TM). Upon certain other events, Lilly could receive an additional $5.0 million in milestone payments.

In connection with the Seragen merger, the Company entered into a definitive asset purchase agreement to acquire substantially all the assets of Marathon Biopharmaceuticals, LLC, which provided manufacturing and other services to Seragen under a service agreement. In January 1999, the Company purchased the assets. Ligand paid, at closing, $5.0 million in the form of the common stock (402,820 shares, valued at $12.41 per

share) with an additional $3.0 million to be paid in August 1999, six months after FDA approval of ONTAK(TM).

Ligand's strategic intent in the acquisition of Seragen was to acquire the technology of Seragen, including ONTAK(TM), a late-stage product that represented a good fit with Ligand's developing cancer product portfolio. The technology acquired from Seragen includes fusion protein expertise and the patent estate related to this technology. (See "Technology -- Fusion Protein Technology.") The patent estate provides Ligand with a potential royalty stream beginning in 2001 for Simulect(R), a Novartis Pharmaceuticals Corporation product. The FDA approved Simulect(R) in May 1998 for acute rejection episodes in renal transplant recipients. (See "Out-licensed Products.")

MARKETED PRODUCTS

Ligand currently markets four products that are approved for the treatment of various cancers -- ONTAK(TM), Panretin(R) gel, PHOTOFRIN(R) and Proleukin(R). ONTAK(TM) and Panretin(R) gel are marketed in the U.S. by Ligand's specialty cancer sales force. PHOTOFRIN(R) and Proleukin(R) are in-licensed products marketed solely in Canada by Ligand's Canadian sales force, which was established in 1995.

<TABLE>
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PRODUCT	APPROVED INDICATION(1)	MARKETING RIGHTS
<S>	<C>	<C>
ONTAK(TM)	CTCL	Worldwide
Panretin(R) gel	Kaposi's sarcoma	Worldwide
PHOTOFRIN(R)	Esophageal cancer, Superficial bladder cancer	Canada Only
Proleukin(R)	Metastatic renal cell carcinoma, Metastatic malignant melanoma	Canada Only

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(1) For a discussion of clinical trials being conducted with ONTAK(TM) and Panretin(R) gel, see "Ligand Products in Clinical Development."

ONTAK(TM). ONTAK(TM), approved by the FDA for the treatment of patients

with persistent or recurrent cutaneous CTCL whose malignant cells express the CD25 component of the IL-2 receptor, was developed using Seragen's fusion protein technology. ONTAK(TM) is the first product commercialized by Ligand for the treatment of CTCL, and the first treatment to be approved for CTCL in nearly 10 years.

CTCL is a type of non-Hodgkin's lymphoma ("NHL") that appears initially in the skin, but over time may involve other organs. The disease can be extremely disfiguring and debilitating, and median survival for late-stage patients is less than three years. The prognosis for CTCL is based in part on the stage of the disease when diagnosed. CTCL is most commonly a slowly progressing cancer, and many patients live with the complications of CTCL for 10 or more years after diagnosis. However, some patients have a much more aggressive form of this disease. CTCL affects an estimated 16,000 people in the U.S.

ONTAK(TM) was granted priority review designation by the FDA in February 1998, and in February 1999, the FDA granted marketing approval for ONTAK(TM) under the accelerated approval regulations for the treatment of patients with persistent or recurrent cutaneous CTCL whose malignant cells express the CD25 component of the IL-2 receptor. ONTAK(TM) is manufactured and marketed by Ligand.

Human clinical studies indicated that ONTAK(TM) was safe and effective for the treatment of patients with previously treated CTCL. The Phase III intent-to-treat analysis of 71 patients showed that 30% of patients treated with ONTAK(TM) had a reduction in tumor burden of 50% or greater and approximately 10% of the patients showed complete resolution of all evidence of the disease for a median duration of nine months. As expected in patients receiving an intravenous infusion of foreign protein, significant adverse events were reported in all patients in the clinical trials including flu-like symptoms (91%); acute hypersensitivity-type reactions (69%); nausea and vomiting (64%); infections (48%) and vascular leak syndrome (27%).

The FDA acted under the accelerated approval regulations in its approval of ONTAK(TM) and requested that the Company conduct certain post-approval clinical and research studies to further document the safety, efficacy and pharmacokinetic profile of this drug.

Panretin(R) gel. Panretin(R) gel, a topical retinoid developed utilizing IR technology, was approved for marketing by the FDA in February 1999 for the topical treatment of cutaneous lesions of patients with AIDS-related KS. The active substance in Panretin(R) gel is a small molecule, non-peptide hormone isolated and characterized in 1991 as 9-cis retinoic acid by scientists at Ligand in collaboration with scientists at The Salk Institute and Baylor. 9-cis retinoic acid is the first non-peptide hormone discovered in over 25 years and appears to be a natural hormone for both the RAR and RXR subfamilies of retinoid receptors. (See "Technology -- Intracellular Receptor Technology.") Panretin(R) gel is one of five proprietary retinoid products in advanced stages of clinical development.

Clinical trials for Panretin(R) gel were launched in June 1994, with Phase III trials commencing in the U.S. in the second quarter of 1996 and internationally in the third quarter of 1996. In June 1998, the Company reported the final analysis of data from the North American and international pivotal Phase III studies at the 12th International AIDS Conference in Geneva, Switzerland. Data from the Phase III pivotal studies demonstrated that Panretin(R) gel is clinically effective in treating the dermal lesions of AIDS-related KS in up to 50% of patients studied, confirming the positive results from the interim analyses reported in December 1997. In February 1999, the FDA approved Panretin(R) gel for the treatment of cutaneous lesions of patients with AIDS-related KS. Panretin(R) gel has received orphan drug designation in this indication.

Ligand is also pursuing approval of Panretin(R) gel for the treatment of cutaneous lesions of patients with AIDS-related KS in Canada and Europe. Ligand filed a New Drug Submission ("NDS") with the Canadian Health Protection Branch ("CHPB") in September 1998 and submitted a Marketing Authorization Application ("MAA") with the European Agency for the Evaluation of Medicinal Products in February 1999. The NDS for Panretin(R) gel has been accepted for priority review in Canada. The NDS filing in Canada and the MAA submission in Europe are based on the pivotal Phase III clinical trials included in the NDA submitted to the

FDA for Panretin(R) gel in May 1998. In January 1999, Ligand announced the formation of Ligand Pharmaceuticals International, Inc. and the appointment of its president of European Operations in anticipation of the submission of the MAA for Panretin(R) gel in Europe.

PHOTOFRIN(R). In March 1995, Ligand acquired from QLT PhotoTherapeutics, Inc. ("QLT") exclusive Canadian marketing rights to PHOTOFRIN(R), a laser-activated drug for use in photodynamic therapy for esophageal cancer and superficial bladder cancer, and began distribution of the product in July 1995. Each year over 3,500 new cases of superficial bladder cancer and 1,200 new cases of esophageal cancer are diagnosed in Canada. In addition, Ligand has the rights to sell the product for any other approved indications in Canada. In August 1997, QLT filed a supplemental NDS with the CHPB for PHOTOFRIN(R) in advanced-stage lung cancer.

Proleukin(R). In September 1994, Ligand acquired from Cetus Oncology Corporation, a subsidiary of Chiron Corporation, exclusive Canadian marketing rights to Proleukin(R), a recombinant human Interleukin-2 for the treatment of metastatic renal cell carcinoma, and began distribution of the product in April 1995. Nearly 3,900 new cases of kidney cancer are reported in Canada each year. Proleukin(R) is also being tested with interferon alpha to determine if additional indications are feasible. In January 1999, the CHPB issued a Notice of Compliance for Proleukin(R) for the treatment of patients with metastatic malignant melanoma.

LIGAND PRODUCTS IN CLINICAL DEVELOPMENT

Ligand is developing several proprietary products for which it has worldwide rights for a variety of cancers and skin diseases. These product development programs are based on retinoids discovered through Ligand's IR technology and ONTAK(TM) which was developed using Seragen's fusion protein technology. (See "Technology.") The table below provides a summary of clinical development programs currently being conducted by Ligand.

<TABLE>
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PROGRAM	DISEASE/INDICATION	DEVELOPMENT PHASE
ONTAK(TM)	Non-Hodgkin's lymphoma (NHL)	Phase II
	Psoriasis	Phase II
Panretin(R) gel	Skin cancers	Phase II
		(Under development)
Panretin(R) capsules	Kaposi's sarcoma (KS)	Phase II
	Pediatric cancers, Breast cancer	Phase II
	Myelodysplastic syndrome (MDS)	Phase II
	Severe plaque psoriasis	Phase II
	Bronchial metaplasia	Phase II
Targretin(R) capsules	CTCL, Lung cancer (minimal disease)	Phase II/III
	Breast cancer	Phase II
	Moderate-to-severe psoriasis	Phase II
	Lung cancer (combination therapy)	Phase II
	Head and neck cancer	Phase II
	Type II diabetes mellitus (Diabetes)	Phase II
Targretin(R) gel	CTCL	Phase III
	Actinic keratoses	Phase II
	Skin cancers	Phase II
		(Under development)
LGD1550 capsules	Advanced cancer	Phase I/II
	Head and neck cancer, Cervical cancer	Phase II
		(Under development)

</TABLE>

Development phase refers to the current stage of development of the most advanced indication. Clinical trials are typically conducted in three sequential phases that may overlap. In Phase I, the initial introduction of the

pharmaceutical into humans, the emphasis is on testing for adverse effects, dosage tolerance, absorption, metabolism, distribution, excretion and clinical pharmacology. Phase II involves studies in a representative patient population to determine the efficacy of the pharmaceutical for specific targeted indications, to determine dosage tolerance and optimal dosage and to identify related adverse side effects and safety risks. Once a compound is found to be effective and to have an acceptable safety profile in Phase II evaluations, Phase III trials are undertaken to evaluate clinical efficacy further and to further test for safety. Sometimes Phase I and II trials or Phase II and III trials are combined. In the U.S., the FDA reviews both the clinical plans and the results of the trials and may discontinue the trials at any time if there are significant safety issues.

In connection with the exercise of the buyback of ALRT and the exclusive licensing arrangement with Allergan, Inc. ("Allergan") (see "Corporate Collaborations -- Allergan Inc."), Ligand acquired the exclusive right to develop and commercialize Panretin(R) capsules, Panretin(R) gel, LGD1550, LGD1268 and LGD1324.

In connection with the corporate collaboration with Lilly described in "Corporate Collaborations -- Eli Lilly and Company," Lilly received worldwide, exclusive rights to Targretin(R), other Ligand compounds and

technology associated with the RXR receptor, HNF4, PPAR modulators and the ob gene pathway in all fields other than cancer and dermatology. In early 1999, Lilly opted not to proceed with the development of certain first generation compounds, including Targretin(R), in the RXR program for diabetes. As a result of this decision, all rights to the oral form of Targretin(R) reverted to Ligand and LGD1268 and LGD1324 returned to the pool of eligible RXR modulators for possible use in oncology in combination with a selective estrogen receptor modulator ("SERM") under the separate collaboration agreement between Ligand and Lilly.

ONTAK(TM). ONTAK(TM) is the first of a new class of targeted cytotoxic biologic agents called fusion proteins. In addition to the use of ONTAK(TM) in CTCL, a Phase II trial for the treatment of patients with NHL is under development by the Eastern Cooperative Oncology Group. Nearly 300,000 people in the U.S. are affected by NHL. Two Phase III trials are currently in progress to evaluate the use of ONTAK(TM) in patients with CTCL who have received two to four previous therapies. A Phase II trial with ONTAK(TM) for the treatment of severe psoriasis, a condition which affects an estimated 1.4 to 1.9 million people in the U.S., is ongoing.

Retinoids. Five of the products in Ligand's proprietary product development programs are retinoids, discovered and developed using Ligand's proprietary IR technology. Retinoids have the ability to trigger natural mechanisms to halt or reverse various forms of cancer. (See "Technology -- Retinoid Responsive IRs.") Retinoids selectively target cells that express retinoid receptors and offer potentially less toxic side effect profiles compared to some chemotherapeutic agents, which may kill rapidly growing cells indiscriminately, cancerous or not. The five retinoid products currently under clinical development by Ligand are Panretin(R) gel, Panretin(R) capsules, Targretin(R) capsules, Targretin(R) gel and LGD1550 capsules.

Panretin(R) gel. Panretin(R) gel incorporates 9-cis retinoic acid, a retinoid isolated and characterized by Ligand in 1991 in collaboration with scientists at The Salk Institute and Baylor. 9-cis retinoic acid is the first non-peptide hormone discovered in over 25 years and appears to be a natural ligand for the RAR and RXR subfamilies of retinoid receptors. (See "Technology -- IR Technology.") A Phase II trial is under development for use of Panretin(R) gel in patients with basal cell carcinoma, a disease with an estimated 600,000 new cases diagnosed in the U.S. each year.

Panretin(R) capsules. Panretin(R) capsules also contain 9-cis retinoic acid and have demonstrated clinical promise for the systemic treatment of cutaneous AIDS-related KS, other cancers and skin disorders. In completed Phase I/II human clinical trials, Panretin(R) capsules were tolerated at doses up to 140 mg/m(2)/day (milligrams per square meter of body surface per day). At the maximum tolerated dose, side effects, including headaches, elevated triglyceride levels, hypercalcemia and mucocutaneous irritation, were dose limiting toxicities.

In February and June 1998, favorable results were reported in two Phase II trials with Panretin(R) capsules in patients with KS. The two Phase II studies were similar in design, with one conducted by the AIDS Malignancy Consortium ("AMC") sponsored by the National Cancer Institute ("NCI") and the other conducted by Ligand. In the studies, Panretin(R) capsules were administered once daily at doses increasing from 60 mg/m(2) to 140 mg/m(2). Study participants had to have biopsy-proven KS associated with AIDS and at least five skin lesions that were assessed every two weeks for response. Response was determined by applying standard AIDS Clinical Trial Group criteria for complete and partial response based on the indicator lesions. The overall response rate at final analysis following the 16-week treatment period for patients meeting the criteria for evaluation was 37% (19 of 50) in the AMC study and included one complete responder. Drug-associated side effects were generally manageable, with some patients requiring dose reductions due to side effects of headache, dry skin, rash, alopecia, peeling/flaking skin and hyperlipidemia as the most common events. The study conducted by Ligand enrolled 57 patients at five study centers. The overall response rate for all patients was 39% (22 of 57), and for patients who met the protocol-defined criteria for evaluation, the overall response rate was 62% (21 of 34). One patient demonstrated a complete response. Almost all patients were on highly active antiretroviral therapy, including at least one protease inhibitor, prior to the start of Panretin(R) capsules therapy. The side effect profile was similar to that in the AMC study. For the 22 responders, two patients relapsed and 20 continued to respond at the time of the study's analysis. The studies' conclusions suggest that patient responses to Panretin(R) capsules occurred independent of their pretreatment

CD4(+)counts, concurrent antiretroviral therapy and prior treatment for AIDS-related KS with systemic chemotherapy.

Ligand is conducting discussions with the FDA regarding the adequacy of the data from these two Phase II clinical trials to support the filing of an NDA for Panretin(R) capsules in AIDS-related KS. Panretin(R) capsules have not shown the more significant side effects observed with commonly prescribed chemotherapies used to treat KS. In addition, chemotherapeutic agents must be administered to KS patients by injection or through intravenous infusion. Panretin(R) capsules may provide patients with an effective way to control the disease in an easily administered oral form.

Phase II trials with Panretin(R) capsules are ongoing in breast and pediatric cancers, and in bronchial metaplasia. Ligand has completed Phase II trials in myelodysplastic syndrome and in severe plaque psoriasis, and the NCI-Canada has evaluated the results of a Phase I/II trial using Panretin(R) capsules in combination with interferon alpha for renal cell carcinoma.

Targretin(R) capsules and Targretin(R) gel. Bexarotene, the active substance in Targretin(R), is a synthetic retinoid developed by Ligand that shows selective retinoid receptor subtype activity that is different from that of 9-cis retinoic acid, the active substance in Panretin(R). (See "Technology -- Retinoid Responsive IRs.") Targretin(R) selectively activates a subclass of retinoid receptors called retinoid X receptors ("RXRs"). RXRs play an important role in the control of a variety of cellular functions. Ligand's preclinical research indicates that bexarotene has utility in the treatment of psoriasis, solid tumors and tamoxifen-resistant breast tumors, as well as in treatment and prevention models of breast cancer. In addition, preclinical studies indicate bexarotene's utility in metabolic disorders, such as type II diabetes mellitus, as these studies demonstrate the ability of bexarotene to decrease blood glucose and insulin levels.

Ligand is developing Targretin(R) capsules for the treatment of patients with refractory or persistent early-stage or refractory advanced-stage CTCL and Targretin(R) gel for the treatment of patients with refractory or persistent early-stage CTCL. If approved, Targretin(R) capsules and Targretin(R) gel, along with the already approved ONTAK(TM), would result in the availability of Ligand products for treating every stage of CTCL. Ligand has completed three trials for the treatment of patients with CTCL with Targretin(R), two Phase II/III trials with Targretin(R) capsules and one Phase III trial with Targretin(R) gel.

Interim findings based on analysis of Phase II/III clinical data for Targretin(R) capsules from the first 84 patients with advanced stage CTCL who were resistant to previous therapies and who received the dose believed

appropriate for marketing (300 mg/m(2)/day) showed a 49% (41 of 84 patients) response rate using the Physician's Global Assessment score. Some early-stage patients received a low dose (6.5 mg/m(2)/day) of Targretin(R) capsules; only one of the 15 patients (7%) who received the low dose achieved a response, suggesting that higher doses are required. Formal analyses in preparation for the submission of an NDA are ongoing.

An interim assessment of a Phase I/II study for Targretin(R) gel in patients with CTCL demonstrated that 59% (36 of 61 patients) showed a 50% or greater improvement in the disease using the Physician's Global Assessment score. A Phase III study of patients with refractory or persistent early-stage CTCL accrued 51 patients. An interim assessment of the first 16 patients who completed the protocol-specified evaluation period for this trial had a response rate of 56% using the Physician's Global Assessment score. Patient enrollment in these trials is complete and formal analyses in preparation for the submission of an NDA are ongoing.

Ligand has completed Phase IIA trials with Targretin(R) gel for the treatment of patients with actinic keratoses, a condition that is estimated to affect up to 5 million people in the U.S. A Phase II trial with Targretin(R) gel for the treatment of patients with non-melanoma skin cancer is under development.

Ligand is also conducting a Phase II trial with Targretin(R)capsules for the treatment of patients with moderate to severe psoriasis, a condition that is estimated to affect between 1.4 and 1.9 million people in the U.S., as well as a Phase II trial in patients with KS. A Phase II study in patients with head and neck cancers has been completed. A Phase II/III trial is also ongoing in lung cancer.

In November 1998, Ligand initiated a Phase II trial with Targretin(R) capsules for the treatment of patients with advanced breast cancer. The purpose of this open-label study is to assess the efficacy, safety and tolerability of Targretin(R) capsules at two dose levels in up to 180 patients at approximately 30 sites at leading cancer centers throughout the U.S. This year, experts predict that more than 180,000 cases of breast cancer will be diagnosed, making it the most common non-skin malignancy in the U.S. among women. The prevalence of breast cancer in the U.S. is estimated to have reached more than 2 million. Tamoxifen is currently the most widely prescribed breast cancer therapy.

A Phase II multicenter trial with Targretin(R) capsules in type II diabetes in Europe is near completion. This trial demonstrated the insulin sensitizing effects of the RXR-selective drug in humans. In November 1997, Ligand initiated a collaboration with Lilly for the development of certain compounds in metabolic disease, including type II diabetes. In the first quarter of 1999, Lilly decided to focus the collaboration's research effort on second generation RXR modulators which show an improved side effect profile in diabetes and opted not to proceed with the development of Targretin(R) capsules and two other first generation compounds in the RXR program in diabetes. As a result of this decision, all rights to Targretin(R) capsules under the agreement relating to its development reverted to Ligand. (See "Corporate Collaborations -- Eli Lilly and Company.")

LGD1550 capsules. LGD1550 is a potent retinoic acid receptor ("RAR") agonist that strongly inhibits growth of several human cancer cell lines. (See "Technology -- Intracellular Receptor Technology.") Phase I/IIA clinical trials in advanced cancer have shown that LGD1550 capsules were well tolerated. Investigators observed dose-limiting skin toxicities, diarrhea and abdominal cramps. Dose-limiting toxicities, such as headache and lipid abnormalities, frequently observed with other retinoids have not been observed with LGD1550. Unlike all-trans retinoic acid, a retinoid approved for the treatment of acute promyelocytic leukemia, LGD1550 does not appear to induce its own metabolism over the dose range tested since blood levels are maintained with continued therapy. Phase II studies with LGD1550 in combination with chemotherapy for the treatment of patients with cervical and head and neck cancers are being designed. The prevalence of cervical cancer cases in the U.S. is estimated at 205,000 cases, while the prevalence of head and neck cancer in the U.S. is estimated at more than 210,000 cases.

LIGAND RESEARCH AND DEVELOPMENT PROGRAMS

Ligand is pursuing several major internally funded and collaborative drug discovery programs based on specific IRs (sex hormone, PPAR and glucocorticoid receptor programs for cancer, skin and eye disease, metabolic disease, men's and women's health and inflammatory disease) and STATs (interferon, hematopoietic growth factor and cytokine programs for cancer and immunological diseases). (See "Technology.")

<TABLE>
<CAPTION>

PROGRAM	DISEASE/INDICATION	DEVELOPMENT PHASE	MARKETING RIGHTS
<S>	<C>	<C>	<C>
SEX HORMONE MODULATORS			
Droloxifene	Osteoporosis	Phase II	Pfizer
CP336,156	Osteoporosis	Phase II	Pfizer
TSE-424	Post-menopausal osteoporosis	Phase II	AHP
ERA-923	Breast cancer	Phase I	AHP
Progesterone Antagonists	Contraception, Reproductive disorders	Lead compounds selected	AHP/Ligand
Progesterone Agonists	Hormone replacement therapy (HRT)	Lead compounds selected	AHP/Ligand
Androgen Antagonists (LGD1331)	Acne, Hirsutism, Alopecia, Prostate cancer, Benign prostatic hyperplasia (BPH)	Development candidate	Ligand worldwide
Androgen Agonists	Male HRT, Cachexia, AIDS-wasting, Osteoporosis	Lead compounds selected	Ligand worldwide
CARDIOVASCULAR/METABOLIC DISEASE			
LDL-lowering Compound	Atherosclerosis	Lead compounds selected	Glaxo
PPAR Modulators	Cardiovascular disease	Lead compounds selected	Glaxo
PPAR Modulators	Diabetes, Metabolic disease	Lead compounds identified	Lilly
RXR Modulators	Diabetes, Metabolic disease	Lead compounds identified	Lilly
HNF-4 Modulators	Diabetes, Metabolic disease	Research	Lilly
ob-gene Pathway	Metabolic disease	Research	Lilly
ob-Leptin	Metabolic disease	Research	SmithKline Beecham
AGN4204 and AGN4326	Type II diabetes mellitus (Diabetes)	Lead compounds selected	Allergan
INFLAMMATORY DISEASE			
Glucocorticoid Agonists	Inflammation	Preclinical	Abbott/Ligand
AGN4310	Psoriasis, Mucotaneous toxicity	Development candidate	Allergan
STATS			
Hematopoietic Growth Factors	Oncology, Anemia	Lead compounds selected	SmithKline Beecham/Ligand
Interferon Agonists	Cancer, Infectious disease, Multiple sclerosis	Lead compounds identified	Ligand worldwide
Cytokine Agonists/Antagonists	Cancer, Immunology, Growth disorders	Research	Ligand worldwide

</TABLE>

Development phase refers to the current stage of development of the most advanced indication. Research activities include research related to specific IR and STATs targets and the identification of lead compounds. Lead compounds are chemicals that have been identified that meet pre-selected criteria in cell culture models for activity and potency against IR or STATs targets. More extensive evaluation is then undertaken to determine if the compound should be selected to enter into preclinical development. Once a lead compound is selected, chemical modification of the compound is then undertaken to create the best drug candidate.

The preclinical phase includes pharmacology and toxicology testing in preclinical models (in vitro and in vivo), formulation work and manufacturing scale-up to gather necessary data to comply with applicable regulations prior to commencement of human clinical trials. Development candidates are lead compounds that have successfully undergone in vitro and in vivo evaluation to demonstrate that they have an acceptable profile, which justifies taking them through preclinical development with the intention of filing an IND and initiating human clinical testing. Clinical trials are typically conducted in three sequential phases that may overlap. (See "Ligand Products in Clinical Development.")

Droloxifene is a Pfizer compound for which Ligand performed work at Pfizer's request. CP336,156 is a compound discovered through the Company's collaborative relationship with Pfizer to which Pfizer has retained marketing rights. (See "Corporate Collaborations -- Pfizer Inc.")

In connection with the corporate collaboration with Lilly described in "Corporate Collaborations -- Eli Lilly and Company," Lilly received worldwide, exclusive rights to Targretin(R), other Ligand compounds and technology associated with the RXR receptor, HNF-4, PPAR modulators and the obgene pathway in all fields other than cancer and dermatology.

In connection with the exercise of the buyback of ALRT and the exclusive licensing arrangement with Allergan, Allergan acquired rights to AGN4204, AGN4326 and AGN4310. Ligand has retained certain compound rights in its collaborations with AHP, SmithKline Beecham and Abbott. (See "Corporate Collaborations.")

SEX HORMONE MODULATORS DEVELOPMENT PROGRAMS

The primary objective of Ligand's sex hormone modulators programs is to develop drugs for hormonally responsive cancers of men and women, hormone replacement therapies and the treatment and prevention of diseases affecting women's health, as well as hormonal disorders prevalent in men. Ligand's programs in the sex hormone modulators area target development of tissue-selective modulators of the progesterone receptor ("PR") and estrogen receptor ("ER") for uses including hormone replacement therapy and various chronic disease indications and the development of androgen receptor ("AR") agonists and antagonists for use in cancer and a number of benign indications. Lead compounds or development candidates have been identified in each of these project areas.

Selective Estrogen Receptor Modulators. Through the Company's collaborations with Pfizer and AHP, four SERMs are in advanced stages of development. (See "Corporate Collaborations.") Droloxifene and CP336,156 have resulted from the Pfizer collaboration and may be used to prevent or treat osteoporosis and reduce the risk of cardiovascular disease in post-menopausal women. These SERMs have also been shown to reduce bone loss and decrease low-density lipoprotein levels ("LDL", or "bad" cholesterol). Droloxifene is an estrogen antagonist-partial agonist compound while CP336,156 is an estrogen partial agonist compound. Both compounds are in Pfizer-sponsored Phase II trials for osteoporosis, with at least one compound targeted to enter Phase III clinical trials according to Pfizer. Two SERMs have also resulted from Ligand's collaboration with AHP -- TSE-424 and ERA-923. TSE-424 is being developed for the treatment of post-menopausal osteoporosis, with Phase I trials completed and Phase II trial protocols under development. ERA-923 is being developed for the treatment of breast and reproductive cancers. AHP filed an IND for ERA-923 for the treatment of women with breast cancer in December 1998 and Phase I trial protocols are under development.

Osteoporosis, the targeted indication for droloxifene, CP336,156 and TSE-424, is a disease characterized by significant loss of bone mass. Osteoporosis, which predominantly affects post-menopausal women, leads to a greater susceptibility to traumatic bone fractures and can lead to curved spine ("dowager's hump") or hip fractures in elderly women. In the U.S., it is estimated that 10 million people have osteoporosis and 18 million more have low bone mass, placing them at increased risk for osteoporosis. Osteoporosis is ordinarily treated by giving women therapeutic doses of estrogen or other steroidal analogues of estrogen. Estrogen therapy is associated with significant side effects, including an increased risk of developing uterine cancer and a concern about a potential increase in breast cancer risk. Estrogen therapy is not well-tolerated by all women and approximately 60% of women abandon the therapy within the first year due to side effects, such as nausea, vomiting, vaginal bleeding and fluid retention, and concern about an increased risk of cancer. Due to their improved side effect profile, the SERMs being developed by Ligand and its collaborators, if commercialized, may provide an improved alternative to estrogen therapy for the treatment of osteoporosis.

PR Modulators. Ligand is developing novel non-steroidal PR antagonists, partial agonists and agonists internally and in collaboration with AHP, for use in hormone replacement therapy, contraception, reproductive disorders and other

applications in women's health. (See "Corporate Collaborations -- American Home Products.") Exploratory clinical research indicates that PR antagonists may have utility in contraception and in a variety of chronic diseases, including endometriosis and cancer. Although PR antagonists currently are

used clinically for acute contraceptive indications, their use in chronic diseases is likely to be limited by their cross-reaction with the glucocorticoid receptor, which is anticipated to produce adverse side effects with long-term administration. Ligand believes that more selective PR antagonists may be useful in the treatment of many hormone responsive diseases, including gynecological and malignant disorders, such as breast and uterine cancer, uterine fibroids (benign smooth muscle tumors) and endometriosis. Because of the very close structural similarity of the IRs for progesterone and glucocorticoids, it has proven difficult to find compounds that do not interact with both.

Ligand has discovered, based on its proprietary tools and approaches, specific PR antagonists that do not cross-react with the IR for glucocorticoids. Ligand has also discovered several additional nonsteroidal lead compounds that are PR modulators. In addition, Ligand has discovered closely related compounds that are full agonists of the PR, which may be useful in contraception, reproductive disorders, and hormone replacement therapy.

Selective Androgen Receptor Modulators ("SARMs.") The primary objective of Ligand's SARMs program is to develop novel tissue-selective AR agonists or antagonists for male hormone replacement therapy and the treatment of skin disorders, osteoporosis, prostate cancer, benign prostatic hyperplasia ("BPH") and other diseases. The growth of most prostate cancers appears to be stimulated by or dependent upon androgens. The use of androgen antagonists has shown efficacy in the treatment of prostate cancer, with three androgen antagonists currently approved by the FDA for use in the treatment of prostate cancer. Ligand believes that there is a substantial medical need for improved androgen modulators for use in the treatment of prostate cancer, as currently available agents appear to have significant side effects.

AR antagonists with an improved side effect profile may provide utility in the treatment of BPH, prostate cancer, acne, hirsutism and male-pattern baldness. AR agonists with distinct tissue selectivity are being developed by Ligand. These novel molecules may have utility for hormone replacement therapy in men and women, male osteoporosis and in the treatment of cachexia associated with chronic disease (e.g., cancer, autoimmune disorders and AIDS). Ligand has identified non-steroidal lead compounds from its internal screening programs. An internally directed medicinal chemistry effort has produced potent, selective, patentable AR agonists that show pharmacological activity in vivo in rodents and AR antagonists that show pharmacological activity in vivo in rodents and dogs. Compounds from these series are being optimized and will be further evaluated as potential preclinical candidates. Ligand intends to pursue the specialty applications emerging from these projects internally, but may seek a collaboration with a pharmaceutical company to exploit broader clinical applications.

Ligand researchers have identified an orally available, non-steroidal AR antagonist, LGD1331, which preclinical studies indicate may have utility for treating acne and hirsutism disorders that affect a significant number of women. This compound may be a promising agent for antiandrogen therapy for prostate cancer, balding in men and BPH. In vivo studies of LGD1331 have revealed favorable characteristics, including indirect evidence of diminished effects on the central nervous system, compared with currently marketed drugs of this type for the treatment of these conditions.

CARDIOVASCULAR/METABOLIC DISEASE DEVELOPMENT PROGRAMS

Ligand scientists are exploring the role of certain orphan IRs in disorders affecting the cardiovascular system. Data suggest that these receptors regulate the expression of apolipoprotein A1 ("ApoA1.") ApoA1 is the major protein constituent of high-density lipoprotein ("HDL"), and recent data link increased levels of ApoA1 to prevention of atherosclerosis.

PPARs, another subfamily of orphan IRs, have been implicated in processes that regulate plasma levels of very low density lipoproteins ("LDL") and triglycerides. (See "Technology -- Intracellular Receptor Technology.") Data implicate PPARs in the mechanism of action of lipid lowering drugs such as Lopid(R). There are three subtypes of the PPAR subfamily with defined novel

aspects of their action -- alpha, beta and gamma. The subtype PPAR alpha appears to regulate the metabolism of certain lipids and is useful in treating hyperlipidemia. PPAR gamma plays a role in fat cell differentiation and cellular responses to insulin. Modulators of PPAR gamma activity (e.g., the glitazone class of insulin sensitizers) have utility in the

management of type II diabetes. PPARs are believed to function in cells in partnership with RXRs. In addition to compounds that act directly on PPARs and that may have utility in various cardiovascular and metabolic disorders, certain retinoids are able to activate this RXR:PPAR complex (e.g., Targretin(R) capsules and LGD1268) and they may also have utility in these disorders. Studies have demonstrated that Targretin(R) capsules have beneficial effects in preclinical models of diabetes.

In September 1992, Ligand entered into a collaboration with Glaxo to discover and develop drugs for the prevention or treatment of atherosclerosis and other disorders affecting the cardiovascular system. In collaboration with Glaxo, Ligand worked to discover drugs which produce beneficial alterations in lipid and lipoprotein metabolism in projects focused on: (1) regulation of cholesterol biosynthesis and expression of a receptor which removes cholesterol from the blood stream, (2) the IRs influencing circulating HDL levels, and (3) PPARs, the subfamily of IRs activated by the clofibrate class of lipid lowering drugs, Lopid(R) and Atromid-S. The collaboration with Glaxo has identified a novel lead structure that activates selected PPAR subfamily members. A different lead compound showing activity in preclinical models has been selected for lowering LDL cholesterol by up-regulating LDL receptor gene expression in liver cells. Glaxo is responsible for the subsequent research necessary to optimize the leads to produce clinical candidates. (See "Corporate Collaborations -- Glaxo-Wellcome plc.")

In November 1997, the Company and Lilly entered into a strategic alliance for the discovery and development of products based upon Ligand's IR technology. The collaboration focuses on products with broad applications across metabolic diseases, including diabetes, obesity, dislipidemia, insulin resistance and cardiovascular diseases associated with insulin resistance and obesity. (See "Corporate Collaborations -- Eli Lilly and Company.")

In March 1998, Ligand and SmithKline Beecham initiated a new collaboration to develop small molecule drugs that modulate the signaling pathway controlled by leptin as a means of discovering orally available drugs for the treatment of obesity. (See "Corporate Collaborations -- SmithKline Beecham.")

INFLAMMATORY DISEASE DEVELOPMENT PROGRAM

In collaboration with Abbott, Ligand is seeking novel small molecule anti-inflammatory drugs. The collaborative program includes molecular approaches to discovering modulators of glucocorticoid receptor activity that have significantly improved therapeutic profiles relative to currently known anti-inflammatory steroids such as prednisone and dexamethasone. The collaboration is focused on the development of novel non-steroidal glucocorticoids with full anti-inflammatory activity and reduced or eliminated side effect profiles. A number of lead compounds have been identified and are currently being optimized for further drug development. (See "Corporate Collaborations -- Abbott Laboratories.")

STAT DEVELOPMENT PROGRAMS

Ligand's proprietary STAT technology is distinct from Ligand's IR technology platform. STATs are activated through a receptor located on the surface of the cell rather than through an intracellular receptor. STAT technology provides Ligand with a second broadly enabling drug discovery platform that has potential applications in cancer, inflammation, asthma, allergy, infectious disease, anemia, obesity, diabetes and growth disorders. (See "Technology -- STAT Technology.") Ligand is pursuing product development opportunities based on its STAT technology through a collaboration with SmithKline Beecham and internally funded programs focusing on interferon agonists and other cytokine agonists and antagonists.

The SmithKline Beecham collaborative research program, initiated in 1995 and expanded in 1998, uses Ligand's STAT technology to discover and characterize small molecule, orally bioavailable drugs to control hematopoiesis, the formation and development of blood cells, for the treatment of a variety of

blood cell deficiencies. In the July 10, 1998 issue of the journal Science, Ligand and SmithKline Beecham scientists announced the discovery of the first non-peptide small molecule that mimics the activity of Granulocyte-Colony Stimulating Factor ("G-CSF"), a natural hormone that stimulates production of infection-fighting neutrophils (a type of white blood cell). This molecule could lead to the development of an orally active drug that could replace recombinant G-CSF (sold by Amgen as Neupogen(TM)), a drug that must be administered

by injection. While the lead compound has only been shown to be active in mice, its discovery is a major scientific milestone and suggests that orally active, small molecule mimics can be developed not only for G-CSF, but for other cytokines as well. Ligand and SmithKline Beecham continue to pursue development of this compound series. (See "Corporate Collaborations -- SmithKline Beecham.")

Ligand's program to discover and develop small molecule, orally available drugs to act as interferon agonists for potential application in various cancers and viral diseases is ongoing. Ligand scientists are currently studying small molecule mimics for both interferon alpha, which has approved indications in the treatment of chronic viral diseases, such as Hepatitis B and C and cancer, and interferon beta, which is approved for the treatment of relapsing-remitting multiple sclerosis. A number of lead compounds with strong efficacy in preclinical in vitro antiviral studies have been identified and are undergoing further characterization.

Ligand continues its internal preclinical program aimed at discovering novel immunomodulatory drugs. Clinically, it is well established that a variety of immune disorders are characterized by unbalanced helper T-cell responses. (Helper T-cells are white blood cells critical to immune response.) Several cytokines play a key role in regulating the proper balance of helper T-cell responses, including interleukin-4 ("IL-4") and interleukin-12 ("IL-12.") Regulating helper T-cell responses through modulation of IL-4 or IL-12 signaling pathways may have application in allergy and asthma in the case of IL-4, and transplant rejection and autoimmune diseases in the case of IL-12. Compelling in vivo evidence suggests that pharmacological intervention in the JAK/STAT signaling pathways activated by IL-4 or IL-12 could result in drugs with novel mechanisms of action that may not only complement, but also greatly improve on current therapies.

OUT-LICENSED PRODUCTS

Ligand has licensed certain patent rights to Cytel related to Cylexin(R) and to Novartis related to Simulect(R).

<TABLE>
<CAPTION>

COMPANY NAME	PRODUCT	DISEASE/INDICATION	DEVELOPMENT PHASE
<S>	<C>	<C>	<C>
Cytel	Cylexin(R)	Reperfusion injury	Phase II/III
Novartis	Simulect(R)	Kidney transplant rejection	Marketed

</TABLE>

Cylexin(R). In February 1998, Glycomed, a wholly owned subsidiary of Ligand, entered into a non-exclusive licensing agreement with Cytel Corporation. As a result, Cytel received the right to a series of Glycomed-owned patents relating to certain carbohydrate compounds for the treatment of acute inflammation. This agreement covers Cytel's most advanced product, Cylexin(R), which is being studied in an ongoing Phase II/III trial to evaluate the safety and efficacy of Cylexin(R) in preventing reperfusion injury in infants undergoing cardiopulmonary by-pass surgery to facilitate surgical repair of life-threatening congenital heart defects. Glycomed is eligible for milestone payments upon certain regulatory filings and approvals.

Simulect(R). Seragen has a license agreement with Novartis that provides for the payment of royalties to Seragen beginning in 2001 for sales of Simulect(R) in the U.S. and Canadian transplantation markets. In May 1998, the FDA approved Simulect(R) for acute rejection episodes in renal transplant recipients. Simulect(R) is a two-dose high-affinity monoclonal antibody. Results of clinical trials in the U.S., Canada and Europe demonstrate that Simulect(R) reduces the rate of acute rejection episodes by one-third.

ACADEMIC COLLABORATIONS

To date, Ligand has licensed technology from The Salk Institute, Baylor and Rockefeller University and developed relationships with key scientists to further the Company's development of its core IR and STAT technologies.

The Salk Institute of Biological Studies. In October 1988, Ligand established an exclusive relationship with The Salk Institute, which is one of the research centers in the area of IR technology. Dr. Ronald Evans, who cloned and characterized the first IR in 1985 and who invented the co-transfection assay used by Ligand, is a professor in the Gene Expression Laboratory of The Salk Institute and an Investigator of the Howard

Hughes Medical Institute. Under the agreement, Ligand has an exclusive, worldwide license to the IR technology developed by Dr. Evans' laboratory at The Salk Institute. Subject to compliance with the terms of the agreement, the term of the license extends for the life of the patents covering such developments. Under the agreement, Ligand made an initial payment to The Salk Institute and issued common stock as partial consideration for the license. Ligand is also obligated to make certain royalty payments based on sales of certain products developed using the licensed technology, as well as certain minimum annual royalty payments.

In May 1998, Ligand submitted a NDA to the FDA for Panretin(R) gel for the treatment of AIDS-related KS. In connection with the submission, Ligand exercised an option to acquire a fully paid up license for the patent rights to Panretin(R) and paid approximately $4.1 million as a one-time license fee to The Salk Institute.

Ligand also entered into exclusive consulting agreements with Dr. Evans that continue through July 2001. Under these agreements, Dr. Evans purchased common stock and has been granted options to purchase common stock. As a consultant, Dr. Evans meets on a regular basis with Company personnel to review ongoing research and to assist Ligand in defining the technical objectives of future research. Dr. Evans is also involved in identifying new developments made in other leading academic laboratories that relate to Ligand's research interests. Dr. Evans serves as Chairman of Ligand's Scientific Advisory Board.

Baylor College of Medicine. In January 1990, Ligand established an exclusive relationship with Baylor, which is a center of IR technology. Dr. Bert W. O'Malley is a professor and the Chairman of the Department of Cell Biology at the Baylor College of Medicine and the Director of the Center for Reproductive Biology who leads IR research at that institution. Important features of Ligand's co-transfection assay were developed in Dr. O'Malley's laboratory and are exclusively licensed by Ligand. Ligand has entered into a series of agreements with Baylor under which it has an exclusive, worldwide license to IR technology developed at Baylor and to future improvements made in Dr. O'Malley's laboratory through September 1999. Subject to compliance with the terms of the agreements, the term of the license may extend for the life of the patents covering such developments.

Ligand works closely with Dr. O'Malley and Baylor in scientific IR research, particularly in the area of sex steroids and orphan IRs. Under the agreement, Ligand is obligated to make payments to Baylor College of Medicine in support of research done in Dr. O'Malley's laboratory for the period from April 1992 through September 1999. Ligand is also obligated to make certain royalty payments based on the sales of products developed using the licensed technology. Ligand has entered into an exclusive consulting agreement with Dr. O'Malley through September 2002. Dr. O'Malley is a member of Ligand's Scientific Advisory Board. Dr. O'Malley has purchased common stock and has been granted options to purchase common stock.

Rockefeller University. In September 1992, Ligand entered into a worldwide, exclusive license agreement with Rockefeller University and exclusive consulting agreements with Dr. James Darnell of Rockefeller University and Dr. David Levy of NYU to develop and commercialize certain technology involving STATs to control gene expression. Dr. Darnell is one of the leading investigators of the control of gene expression by STATs. Rockefeller University received payments upon the transfer of the technology to Ligand and upon the first four anniversary dates of the agreement and, subject to a vesting schedule, shares of common stock and warrants to purchase shares of common stock. In addition, Rockefeller University will receive a royalty on any commercialized products. In

consideration of related technology assigned by NYU to Rockefeller University and covered by the license agreement with Ligand, NYU received, subject to a vesting schedule, shares of common stock and warrants to purchase shares of common stock. Subject to a vesting schedule tied to their consulting agreements, Dr. Darnell and Dr. Levy received shares of common stock. In addition, in October 1994 Ligand granted Dr. Darnell options to purchase shares of common stock.

In addition to the collaborations discussed above, the Company also has a number of other consulting, licensing, development and academic agreements by which it strives to advance its technology.

TECHNOLOGY

Ligand and its exclusive academic collaborators have advanced the understanding of the activities of hormones and hormone-related drugs and have made scientific discoveries relating to IR and STAT technologies. Ligand believes that its expertise in these technologies will enable the Company to develop novel, small-molecule drugs acting through IRs or STATs with more target-specific properties than currently available drugs, resulting in either improved therapeutic and side effect profiles and new indications for IRs or novel mechanisms of action and oral activity for STATs.

In addition to the Company's proprietary IR and STAT technologies, Ligand has acquired fusion protein technology, which was utilized by Seragen in the development of ONTAK(TM).

INTRACELLULAR RECEPTOR ("IR") TECHNOLOGY

Hormones occur naturally within the body and control processes such as reproduction, cell growth and differentiation. Hormones generally fall into two general classes, the peptide hormones and non-peptide hormones. The non-peptide hormones include the retinoids, sex steroids (estrogens, progestins and androgens), adrenal steroids (glucocorticoids and mineralocorticoids), vitamin D and thyroid hormone. These non-peptide hormones act by binding to their corresponding IRs to regulate the expression of genes in order to maintain and restore balanced cellular function within the body. Hormonal imbalances can lead to a variety of diseases. The hormones themselves and drugs which mimic or block hormone action may be useful in the treatment of these diseases. Furthermore, hormone mimics (agonists) or blockers (antagonists) can be used in the treatment of diseases in which the underlying cause is not hormonal imbalance.

The effectiveness of the IRs as drug targets has been demonstrated by currently available drugs acting through IRs for many of these diseases. However, the use of most of these drugs has been limited by their often significant side effects. Examples of currently marketed hormone-related drugs acting on IRs are glucocorticoids (steroids used to treat inflammation), natural and synthetic estrogens and progesterones (used for hormone replacement therapy and contraception), tamoxifen (an estrogen antagonist used in the treatment of breast cancer), and various retinoids such as Accutane(R) and Retin-A(R) (used to treat acne and others to treat psoriasis).

The understanding of non-peptide hormones and their actions has increased substantially in the last 15 years. Driving this rapid expansion of knowledge has been the discovery of the family of IRs through which all the known small-molecule, non-peptide hormones act. Dr. Ronald Evans at The Salk Institute, Ligand's scientific co-founder and exclusive consultant, was the first to clone and characterize a functional human IR in 1985. Since that time, approximately 75 IRs have been defined and characterized, some by Ligand's scientists or its exclusive collaborators.

Ligand and its collaborators and consultants have made major discoveries pertaining to IRs and small molecule hormones and compounds, which interact with these IRs. These discoveries include: (1) the identification of the IR superfamily, (2) the recognition of IR subtypes, (3) the discovery of orphan IRs and (4) the heterodimer biology of RXR selective compounds. Ligand believes that each of these broad areas of knowledge provides important opportunities for drug discovery.

The receptors for all the non-peptide hormones are closely related members of a superfamily of proteins known as IRs. The IRs are similar in both structure

and mechanisms of action. Human IRs for all of the known non-peptide hormones have now been cloned, in many cases by Ligand's scientists or its collaborators, building an understanding of the similar underlying mechanisms of action shared by the non-peptide hormones. Because they have a common mechanism of action, drug discovery insights about one IR can often be directly applied to other members of the IR superfamily, bringing synergy to Ligand's IR-focused drug discovery efforts. First generation drugs were developed and commercialized for their therapeutic benefits prior to the discovery of IRs and often cross-react with the IRs for hormones other than the intended target, resulting in often significant side effects. The understanding that IRs are structurally similar has enabled Ligand to determine the basis for the side effects of some first generation drugs and to discover improved drug candidates.

For some of the non-peptide hormones, several closely related but non-identical IRs, known as IR subtypes, have been discovered. These include six subtypes of the IRs for retinoids, two subtypes of the IRs for thyroid hormone, two subtypes for the ER, and three subtypes for the PPARs. Patent applications covering many of these IR subtypes have been exclusively licensed by Ligand. Ligand believes that drugs that activate a subset of IR subtypes will allow more specific pharmacological intervention better matched to therapeutic need. Ligand's clinical candidate Targretin(R), an RXR selective molecule, was discovered as a result of Ligand's understanding of retinoid receptor subtypes.

Over 50 additional members of the IR superfamily, which do not interact with the known non-peptide hormones, have been discovered. These members of the IR superfamily have been designated orphan receptors. Ligand believes that among the orphan IRs may be receptors for uncharacterized small molecule hormones and that the physiological roles of the various orphan IRs are likely to be diverse. Ligand has devised strategies to isolate small molecules that interact with orphan IRs.

RXRs can form a dimer with numerous IRs, such as the retinoic acid receptor ("RAR"), thyroid hormone receptor and vitamin D receptor. While RXRs are widely expressed, their IR partners are more discrete, being expressed in selective tissues, such as liver, fat or muscle. As a result, compounds that bind RXRs offer the unique potential to be broadly active compounds that can treat a variety of diseases, including cancer and metabolic diseases. In preclinical models of type II diabetes, RXR agonists appear to stimulate the physiological pathways responsive to RXR-PPAR receptor partners expressed in key target tissues that are involved in glucose metabolism. As a result, a discrete set of genes is activated in these tissues resulting in a decrease in serum glucose levels and insulin.

Ligand has built a strong proprietary position and accumulated substantial expertise in IRs applicable to drug discovery and development. Building on its recent scientific findings about the molecular basis of hormone action, Ligand has created proprietary new tools to explore and manipulate non-peptide hormone action for potential therapeutic benefit. The Company has exclusive relationships in the field of IRs with Dr. Ronald Evans, a professor in the Gene Expression Laboratory of The Salk Institute, and Dr. Bert O'Malley, a professor and Chairman of the Department of Cell Biology and Director of the Center for Reproductive Biology at Baylor, where many of the core discoveries in IR research have been made. The Company has exclusively licensed most of these discoveries.

Retinoid Responsive IRs ("RRs.") Retinoic acid, a derivative of Vitamin A, is one of the body's natural regulatory hormones that has a broad range of biological actions, influencing cell growth, differentiation, programmed cell death and embryonic development. Many chemical analogues of retinoic acid, called retinoids, also have biological activity.

Specific retinoids have been approved by the FDA for the treatment of psoriasis and certain severe forms of acne. Evidence also suggests that retinoids can be used to arrest and, to an extent, reverse the effects of skin damage arising from prolonged exposure to the sun. Other evidence suggests that retinoids are useful in the treatment of a variety of cancers, including kidney cancer and certain forms of leukemia. For example, all-trans-Retinoic-acid has been approved by the FDA for the treatment of acute promyelocytic leukemia. Retinoids have also shown an ability to reverse precancerous (premalignant) changes in tissues, reducing the risk of development of cancer, and may have potential as preventive agents for a variety of epithelial malignancies,

including skin, head and neck, bladder and prostate cancer. Currently marketed retinoids cause significant side effects, such as severe birth defects if fetal exposure occurs, severe irritation of the skin and mucosal surfaces, elevation of plasma lipids, headache and skeletal abnormalities. Currently marketed retinoids were developed and commercialized prior to the discovery of retinoid-responsive IRs.

The six RRs that have been identified to date can be grouped in two subfamilies -- Retinoic Acid Receptors ("RARs") and RXRs. Patent applications covering members of both families of RRs have been licensed exclusively to Ligand primarily from The Salk Institute. The RR subtypes appear to have different functions, based on their distribution in the various tissues within the body and data arising from in vitro and in vivo studies including studies of transgenic mice. Several of the retinoids currently in commercial use are either non-selective in their pattern of RR subtype activation or are not ideal drugs for other reasons. Ligand is

developing chemically synthesized retinoids that, by selectively activating RR subtypes, may preserve desired therapeutic effects while reducing side effects.

Ligand has one retinoid product approved by the FDA (Panretin(R) gel), five retinoid products in clinical trials (Panretin(R) gel, Panretin(R) capsules, Targretin(R) capsules, Targretin(R) gel and LGD1550 capsules), and five retinoid compounds in advanced preclinical evaluation through its corporate partners.

SIGNAL TRANSDUCERS AND ACTIVATORS OF TRANSCRIPTION ("STAT") TECHNOLOGY.

STATs are a recently discovered family of proteins that are a key part of the signal transduction pathway for a variety of biologically important polypeptide hormones (e.g., interferons, interleukins, leptin and hematopoietic growth factors). STATs play a role in the biology of cytokines and growth factors functionally analogous to that played by IRs in the biology of the non-peptide hormones. Both STATs and IRs are families of transcription factors that change cell function by selectively turning on or off particular genes in response to circulating signals that impinge on cells. When various cytokines or growth factors bind to their receptors on the cell surface, this triggers the activation of specific members of the Janus Kinase family of tyrosine protein kinases ("JAKs"), which in turn activate specific STATs. The activated STATs enter the cell nucleus and bind to the control regions of specific target genes and increase their expression, thereby modulating physiologic or pathophysiologic processes.

Many diseases, such as certain inflammatory conditions, may be the result of excessive activity of certain cytokines. In these conditions it may prove beneficial to block the actions of specific cytokines. In other pathological states there is insufficient activity of specific cytokines. For example, in patients with chronic renal failure, diminished erythropoietin ("EPO") release by the damaged kidneys results in the inadequate production of red blood cells, causing anemia. Recombinant human EPO protein (Epogen(R)) can be administered to correct this anemia effectively, but must be injected. Many other cytokines are useful as injected protein medicines, including interferons (Intron-A(R), Roferon(R), Betaseron(R)), interleukins (e.g., Proleukin(R), which Ligand markets in Canada), and hematopoietic growth factors (Epogen(R), Neupogen(R)). Each of these and many other cytokines appear to exert their actions through JAK/STAT signal transduction pathways.

Ligand is utilizing JAK/STAT technologies to seek low molecular weight compounds able to mimic or block the actions of medically relevant cytokines for uses in various pathological conditions, including cancer, inflammation and disorders of blood cell formation. Because these compounds are small molecules, whereas the cytokines themselves are proteins, they offer potentially significant advantages over current cytokine-based compounds, including oral bioavailability, greater ease of manufacture and improved stability.

The discovery of STATs, the elucidation of their roles in interferon signal transduction, and the first cloning of genes encoding STATs were all accomplished by Ligand's exclusive collaborator, Dr. James Darnell at Rockefeller University, and were described initially in August 1992. A total of seven members of the STAT family have been identified and a large number of peptide hormones have been shown to utilize STAT signaling pathways. These peptide hormones include the interferons (alpha, beta and gamma), the

hematopoietic colony stimulating factors (interleukin-3, EPO, G-CSF, GM-CSF and thrombopoietin), many of the interleukins and the related Oncostatin M and Leukemia Inhibitory Factor, the cytokine leptin, growth hormone and prolactin.

Ligand believes that its JAK/STAT drug discovery technology can produce drug candidates to control gene expression to address a broad range of uses, including treating cancer, providing hematopoietic support for cancer patients undergoing chemotherapy or bone marrow transplantation, combating inflammation, treating viral or other infections, treating anemia in chronically ill patients (e.g., those with renal failure), treating dwarfism and related disorders of stature, and enhancing immune function.

Ligand is using its high throughput screening assays to discover small molecule drugs to act as interferon agonists for potential application in various cancers and viral diseases and that act as cytokine agonists and antagonists in cancer and immunology. Ligand has also established a collaboration with SmithKline Beecham to discover and characterize small molecule drugs to modulate specific JAK/STAT pathways to control the

formation of red and white blood cells for treating patients with cancer or anemia. Ligand has additional assays under development to allow high throughput screening for and subsequent optimization of small molecule drugs that act through JAK/STAT signaling pathways to block or mimic other medically significant cytokine and growth factors.

FUSION PROTEIN TECHNOLOGY

Ligand's fusion protein technology was developed by Seragen. Seragen's fusion proteins consist of fragments of diphtheria toxin genetically fused to a ligand that targets specific receptors on the surface of target cells. The fusion proteins are designed to bind to specific receptors on the surface of target cells and penetrate and destroy the target cells' ability to manufacture proteins, thereby killing the target cells. Using this platform, Seragen has genetically engineered six fusion proteins, each of which consists of fragments of diphtheria toxin fused to a different targeting ligand, such as a polypeptide hormone or growth factor. ONTAK(TM), which is approved in the U.S. for the treatment of patients with persistent or recurrent CTCL, is a fusion protein consisting of fragments of diphtheria toxin genetically fused to the interleukin-2 ("IL-2") receptor. In addition to CTCL, fusion proteins may have utility in oncology, dermatology, infectious diseases and autoimmune diseases.

Seragen has entered into exclusive license agreements with Harvard University and other parties for patents related to fusion protein technology. In addition, Seragen has been prosecuting a patent application family directed to its core fusion protein technology, which technology represents an improvement in the technology licensed from Harvard University. Four U.S. patents have issued directed to these improvements.

LIGAND'S PROPRIETARY CELL-CULTURE BASED ASSAY SYSTEM

Ligand has developed a hybrid approach to lead compound identification that retains the best features and avoids the pitfalls of traditional methods to discover leads. Traditional drug discovery generally uses animal models or biochemical screening systems for lead compound identification. Animal models are relatively slow, complicated and expensive; and results in animals do not always correlate to those obtained in humans. Biochemical assays are fast and inexpensive, but give limited information and frequently identify poor lead compounds.

Ligand's hybrid approach is a proprietary cell-culture based assay system for small molecules that can modulate IRs, referred to as the co-transfection assay. The co-transfection assay system simulates the actual cellular processes controlled by IRs and is able to detect whether a compound interacts with a particular human IR and whether this interaction mimics or blocks the effects of the natural regulatory molecules on target gene expression. The system is: (1) fast, compared to animal models; (2) capable of cost-effective, high throughput screening of thousands of compounds per week; (3) generally predictive of in vivo pharmacology of both agonists and antagonists; (4) able to separate complex targets, such as receptor subtypes; and (5) conducted using the actual human receptors which are the ultimate drug targets. Ligand's co-transfection assay is a key component of Ligand's IR drug discovery and development programs, and

facilitates both the identification of lead compounds and their optimization as clinical candidates. Ligand has developed similar automated high throughput assays to identify lead compounds acting as agonists or antagonists of selected JAK/STAT signaling pathways for interferons, certain interleukins and selected hematopoietic growth factors.

Once Ligand verifies a lead compound for a particular target, the next critical process is optimization of the compound to achieve specificity and appropriate properties as a drug. Specificity is achieved when the compound interacts only with the intended target molecule and not with related but unintended molecules. Ligand's unique and comprehensive ability to assess compounds preclinically for interactions with all the known human IRs and in various STAT pathways is a significant advantage in obtaining specificity in a lead compound. Optimization of a lead compound is an iterative process in which analogues of the lead compound, designed and synthesized by medicinal chemists, are assayed for activity. The results obtained with each set of analogues guide the medicinal chemists in the design of compounds with greater specificity. The

co-transfection assay produces results that enhance the accuracy and efficiency of this iterative optimization process.

Ligand believes that its combination of modern molecular and traditional approaches to drug discovery will accelerate its progress to develop new drug candidates. To that end, Ligand has built a strong multidisciplinary team, consisting of endocrinologists, molecular biologists, medicinal chemists, pharmacologists and specialists in drug metabolism and distribution, and other pharmaceutical scientists.

CORPORATE COLLABORATIONS

Ligand has initiated eight significant collaborations with corporate partners since the inception of the Company to further the research and development of compounds based on the Company's IR and STAT technologies.

Eli Lilly and Company. In November 1997, the Company and Lilly entered into a strategic alliance for the discovery and development of products based upon Ligand's IR technology. The collaboration focuses on products with broad applications across metabolic diseases, including diabetes, obesity, dislipidemia, insulin resistance and cardiovascular diseases associated with insulin resistance and obesity. At the inception of the agreement, Lilly invested $37.5 million by purchasing the Company's common stock and made an upfront nonrefundable milestone payment to Ligand of $12.5 million. Ligand is entitled to additional milestones upon the successful development of certain products. If certain products are approved, Ligand may receive double-digit royalties on net sales of the most advanced products and single-digit royalties on net sales of earlier compounds. Ligand may also qualify to receive milestones, royalties and options to obtain certain co-development and co-promotion rights for the Lilly-selected RXR compound in combination with a SERM.

Under the alliance Lilly received worldwide, exclusive rights to Targretin(R) and other Ligand compounds and technology associated with the RXR receptor in the field. Lilly received additional rights to use Ligand technology to develop an RXR compound in combination with a SERM in cancer. Ligand retains exclusive rights to independently research, develop and commercialize Targretin(R) and other RXR compounds in the fields of cancer and dermatology. Lilly also received worldwide, exclusive rights in certain areas to Ligand's PPAR technology, along with rights to use PPAR research technology with the RXR technology. Lilly and Ligand also intend to begin research programs aimed at discovering novel compounds that therapeutically activate PPAR subtypes for treatment of cardiovascular disease. Finally, Lilly received exclusive rights to Ligand's HNF4 receptor and the obesity gene promoter technology. Ligand has the option to obtain selected rights to one of Lilly's specialty pharmaceutical products. The product would fit into a current area of strategic focus for Ligand. Should Ligand elect to obtain selected rights to the product, Lilly could receive milestones of up to $20 million in common stock. In connection with the acquisition of Seragen, Ligand obtained from Lilly its rights to ONTAK(TM) in satisfaction of Ligand's option to obtain selected rights to one of Lilly's specialty pharmaceutical products.

Lilly has the right to terminate the development of compounds under the

agreements, with Ligand receiving rights to certain of such compounds in return for a royalty to Lilly, the rate of which is dependent on the stage at which the development is terminated. In addition, either party may terminate the agreements if a material breach by the other remains uncured for 90 days.

In early 1999, Lilly chose not to proceed with the development efforts for three first generation compounds in the RXR program in diabetes. Instead, Lilly and Ligand have agreed to focus their efforts on the RXR modulator second generation program, which has compounds with improved therapeutic indices relative to the three first generation compounds, and on co-agonists of the PPAR receptor program. As a result of this decision, all rights to the oral form of Targretin(R) relating to its development reverts to Ligand. Compounds LGD1268 and LGD1324 return to the pool of eligible RXR modulators for possible use in oncology in combination with a selective estrogen receptor modulator under the separate collaboration agreement between Lilly and Ligand. The decision not to proceed with full development of the first generation compounds was based upon a thorough review of the pre-clinical and Phase II clinical date on Ligand's RXR modulators, Targretin(R), LGD1268 and LGD1324. As of December 31, 1998, Lilly had funded approximately $11.0 million of the total of $49.0 million in potential research funding under the agreement.

SmithKline Beecham. In February 1995, Ligand entered into a collaborative agreement with SmithKline Beecham providing for a three-year research program (with an option to extend the program for two years at SmithKline Beecham's election). Under the agreement, SmithKline Beecham will utilize Ligand's proprietary STATs technology to discover and characterize small molecule, oral drugs to control hematopoiesis (the formation and development of blood cells). Under the terms of the agreement, SmithKline Beecham was granted exclusive worldwide rights for products resulting from the collaboration in certain targeted areas. In exchange, SmithKline Beecham agreed to provide Ligand up to $9.0 million in research funding and up to $12.5 million in equity investments. SmithKline Beecham will make additional milestone payments to Ligand as the compounds progress in clinical development and will also make royalty payments on product sales.

Ligand has the right to select up to three compounds related to hematopoietic targets for development as anti-cancer products other than those compounds selected for development by SmithKline Beecham. SmithKline Beecham has the option to co-promote these products with Ligand in North America and to develop and market them outside North America. SmithKline Beecham can terminate the research program upon 60 days notice in the event of any breach by Ligand or upon six months notice at any time after August 1996.

In April 1998, Ligand and SmithKline Beecham formed a new collaboration to develop small molecule drugs that modulate the signaling pathway controlled by leptin as a means of discovering orally available drugs for treatment or prevention of obesity. As part of the leptin-obesity collaboration, SmithKline Beecham purchased $5.0 million of common stock and also purchased a $1.0 million warrant exercisable into common stock. The warrant expires in five years, and Ligand may require SmithKline Beecham to exercise the warrant under certain conditions after three years. Under the new agreement, SmithKline Beecham obtained exclusive worldwide rights to products resulting from the obesity collaboration and has agreed to make milestone payments to Ligand as compounds progress through preclinical and clinical development, and royalty payments on sales, if products result from the research. As of December 31, 1998, SmithKline Beecham had funded approximately $11.4 million of the total of $11.5 million in potential research funding under the agreement.

American Home Products. In September 1994, Ligand entered into a collaborative research agreement with Wyeth-Ayerst Laboratories, the pharmaceutical division of AHP, providing for a three-year research program (with an option to extend the program for two years at AHP's election). The purpose of the agreement was to discover and develop drugs that interact with estrogen or progesterone receptors for use in hormone replacement therapy, anti-cancer therapy, gynecological diseases, central nervous system disorders associated with menopause and fertility control. AHP has been granted exclusive worldwide rights to all products discovered in the collaboration that are agonists or antagonists to the PRs and ERs for application in the fields of women's health and cancer therapy. Under the agreement, AHP agreed to provide $21.5 million in research funding and up to $25.0 million in equity and convertible notes, in addition to milestone and royalty payments to Ligand for such products.

An important additional aspect of this collaboration is Ligand's right to assay AHP's extensive chemical library for activity against a selected set of targets of Ligand's internal programs. Ligand may select up to 24 lead compounds for internal development to which Ligand has worldwide rights. In January 1996, AHP exercised its option to include compounds discovered by Ligand that modulate PRs and to expand the collaboration to encompass the treatment or prevention of osteoporosis through the ER. In connection with the exercise of the option, the Company received $2.5 million in additional research revenue and funding commitments. Ligand's proprietary PR modulators added to the collaboration includes three series: LG121046 (Series A), LG120527 (Series B) and LG120716 (Series C). In 1997, Ligand regained rights to the series B and series C compounds in the AHP collaboration. Series A compounds formed the basis for additional drug discovery in the AHP alliance, leading to both PR agonists and antagonists. In May 1996, AHP expanded the collaboration to include four advanced chemical compound series from its internal ER-osteoporosis program. The research phase of the collaboration ended in August 1998. AHP has ongoing studies with two other compounds, TSE-424, a potential treatment for osteoporosis and ERA-923, a potential treatment for breast cancer. The IND filing of both compounds in 1998 and early 1999 triggered two separate

milestone payments to Ligand. (See "Technology.") As of December 31, 1998, AHP had funded approximately $17.9 million of the total of $21.5 million in potential research funding under the agreement.

Abbott Laboratories. In July 1994, Ligand entered into a collaborative research agreement with Abbott providing for a five-year research program to discover and develop small molecule compounds for the prevention or treatment of inflammatory diseases. The collaborative program includes several approaches to discovering modulators of glucocorticoid receptor activity to treat inflammation. (See "Inflammatory Disease.")

Abbott has also committed significant internal resources to the collaboration. Abbott was granted exclusive worldwide rights for all products discovered in the collaboration for use in inflammation. Ligand was granted exclusive worldwide rights for all anti-cancer products discovered in the collaboration. Abbott will make milestone and royalty payments on products targeted at inflammation resulting from the collaboration, while Ligand will make milestone and royalty payments on products targeted at anti-cancer resulting from the collaboration. Each party will be responsible for the development, registration and commercialization of the products in its respective field. Abbott can terminate the research program at any time upon 90 days notice in the event of any breach by Ligand or upon four months notice at any time. As of December 31, 1998, Abbott had funded approximately $9.2 million of the total of $16.0 million in potential research funding under the agreement.

Sankyo Company, Ltd. As part of the Merger with Glycomed, the Company acquired a collaborative research agreement with Sankyo that Glycomed had entered into in June 1994 providing for a three-year research program. Under the agreement, Sankyo reimburses a portion of the Company's research expenses related to the collaboration up to an aggregate of $8.9 million. The agreement also provides that upon being presented with a target compound arising from the research collaboration with the Company, Sankyo will notify the Company whether it wishes to pursue development of the compound. In October 1997, the research program was terminated. As of December 31, 1998, Sankyo had funded all of the total of $8.9 million in potential research funding under the agreement.

Glaxo-Wellcome plc. In September 1992, Ligand entered into a five-year collaborative research agreement with Glaxo to develop drugs for the prevention or treatment of cardiovascular disease. Glaxo committed significant internal resources to the collaboration and funded one-half of Ligand's research expenses to support 18 Ligand scientists assigned to the collaboration. Ligand and Glaxo screened compounds to identify potential lead compounds. Once leads have been identified, Glaxo has primary responsibility for pharmacology, medicinal chemistry to optimize the drug candidates and preclinical testing. Glaxo also has responsibility for conducting clinical trials of the drug candidates for marketing approval by the FDA and certain other regulatory agencies. Ligand will receive milestone payments as the compounds progress through the development cycle and a royalty on any commercialized products. Ligand has retained the right to develop and commercialize products arising from the collaboration in markets not exploited by Glaxo or where Glaxo is not developing a product for

the same indication. The collaborative research program was completed in September 1997. Glaxo is responsible for the subsequent research necessary to optimize the leads to produce clinical candidates. As of December 31, 1998, Glaxo had funded approximately $9.2 million of the total of $10.0 million in potential research funding under the agreement.

Allergan Inc. In June 1992, Ligand and Allergan formed Allergan-Ligand Joint Venture ("the Joint Venture"), owned 50% by each party, to discover, develop and commercialize retinoid drugs. In December 1994, the Company and Allergan formed Allergan Ligand Retinoid Therapeutics, Inc. ("ALRT") to continue the research and development activities previously conducted by the Joint Venture. In June 1995, the joint venture was dissolved and the Company and ALRT completed a public offering of 3,250,000 units (the "Units") totaling $32.5 million. Each Unit consisted of one share of ALRT's Callable Common Stock and two warrants entitling the holder to purchase one share of Common stock. The $32.5 million aggregate proceeds ("the ALRT Offering") and cash contributions by Allergan and Ligand of $50.0 million and $17.5 million, respectively, provided net proceeds of $94.3 million for retinoid product research and development. As part of the ALRT Offering, all rights held by the Joint Venture were licensed to ALRT. The Company, Allergan and ALRT entered into certain other various agreements in connection with the funding

of ALRT, including a Technology License Agreement, a Research and Development Agreement, a Commercialization Agreement, and a Services and Administrative Agreements.

Ligand's $17.5 million in cash, as well as warrants were in exchange for: (1) a right to acquire all of the Callable Common Stock at specified future dates and amounts (the "Stock Purchase Option") and (2) a right to acquire all rights to the Panretin(R) (ALRT 1057) product, jointly with Allergan (the "1057 Option.") Allergan's $50.0 million cash contribution to ALRT was in exchange for: (1) the right to acquire one-half of technologies and other assets in the event Ligand exercised its right to acquire all of the Callable Common Stock (the "Asset Purchase Option"), (2) a similar right to acquire all of the Callable Common Stock if Ligand did not exercise its right and (3) a right to acquire all rights to Panretin(R) (ALRT 1057) product, jointly with Ligand.

In September 1997, Ligand exercised the option to purchase all of the Callable Common Stock of ALRT. At the same time, Allergan exercised the option to purchase certain assets of ALRT. In November 1997, Ligand issued 3,166,567 shares of the Company's common stock along with cash payments totaling $25.0 million, to holders of the Callable common stock. In November 1997, Allergan made a cash payment of $8.9 million to ALRT, which was used by Ligand to pay a portion of the Stock Purchase Option. The excess of the purchase price over the fair value of net assets acquired was allocated to in-process technology and written off resulting in a one time non-cash charge to operations of $65.0 million in 1997.

In November 1997, ALRT became a wholly owned subsidiary of the Company. Also during 1997, Ligand and Allergan agreed to restructure the terms and conditions relating to research, development, and commercialization and sublicense rights for the ALRT compounds. Under the restructured arrangement, Ligand received exclusive, worldwide development, commercialization and sublicense rights to Panretin(R) capsules and Panretin(R) gel, LGD1550, LGD268 and LGD324. Allergan received exclusive, worldwide development, commercialization and sublicense rights to LGD4310, an RAR antagonist being developed for topical application against mucocutaneous toxicity associated with currently marketed retinoids as well as for psoriasis. Allergan also received LGD326 and LGD4204 (two advanced preclinical RXR selective compounds). In addition, Ligand and Allergan participated in a lottery for each of the approximately 2,000 retinoid compounds existing in the ALRT compound library as of the closing date, with each party acquiring exclusive, worldwide development, commercialization and sublicense rights to the compounds which they select.

Ligand and Allergan will each pay the other a royalty based on net sales of products developed from the compounds selected by each in the lottery and the other ALRT compounds to which each acquires exclusive rights. Ligand will also pay to Allergan royalties based on Ligand's net sales of Targretin(R) for uses other than oncology and dermatology indications. In the event that Ligand licenses commercialization rights to Targretin(R) to a third party, Ligand will pay to Allergan a percentage of royalties payable to Ligand with respect to

sales of Targretin(R) other than in oncology and dermatology indications. Under the restructured arrangement, on the closing of the exercise of the Stock Purchase Option and the Asset Purchase Option, Ligand paid Allergan a non-refundable cash payment in the amount of $4.5 million. ALRT had provided approximately $52.0 million in research funding to Ligand under the Research and Development Agreement. Since 1992, Allergan Ireland, a wholly owned subsidiary of Allergan, has made $30.0 million in equity investments in Ligand.

Pfizer Inc. In May 1991, Ligand entered into a five-year collaborative research and development and license agreement with Pfizer to develop better alternative therapies for osteoporosis. Pfizer agreed to provide up to $3.0 million per year in research funding to Ligand in addition to committing significant internal resources. In November 1993, Ligand and Pfizer announced the successful completion of the research phase of their alliance with the identification of a development candidate and backups for the prevention and treatment of osteoporosis. In preclinical studies, the candidates from the program mimic the beneficial effects of estrogen on bone and have an impact on blood serum lipids often associated with cardiac benefits without increasing uterine or breast tissue proliferation. Under the terms of the collaboration, Pfizer has primary responsibility for pharmacology, medicinal chemistry to optimize the drug candidates, pre-clinical testing and clinical trials of drug candidates for marketing approval by the FDA and certain other regulatory agencies.

Ligand has granted Pfizer exclusive worldwide rights to manufacture and market any compounds jointly developed for osteoporosis. Ligand is to receive up to $7.5 million in milestone payments as development objectives are achieved, in addition to royalties on sales of successful drugs that emerge from the alliance.

In December 1994, Ligand filed suit against Pfizer in the Superior Court of California in San Diego County. The suit was filed for breach of contract and for a declaration of future rights as they relate to droloxifene, a compound upon which Ligand performed work at Pfizer's request during the collaboration between Pfizer and Ligand to develop drugs in the field of osteoporosis. Ligand and Pfizer entered into a settlement agreement with respect to the lawsuit in April 1996. Under the terms of the settlement agreement, Ligand is entitled to receive milestone and royalty payments if Pfizer continues development and eventually commercializes droloxifene. To date, Ligand has received approximately $1.3 million in milestone payments from Pfizer as a result of the continued development of droloxifene. These milestones were paid in the form of the Company's common stock by Pfizer and were subsequently retired from treasury stock in September 1996. According to announcements by Pfizer, droloxifene has entered Phase II clinical trials for osteoporosis. As of December 31, 1998, Pfizer had made a total of $7.5 million of equity investments in Ligand and had funded approximately $9.4 million in research funding.

MANUFACTURING

Ligand currently has no manufacturing facilities outside of Marathon's facility for the manufacturing of ONTAK(TM), and accordingly relies on third parties, including its collaborative partners, for clinical or commercial production of any products or compounds under consideration as products. For a discussion of the risks associated with manufacturing see "Risks and Uncertainties."

RAW MATERIALS

Certain raw materials necessary for the Company's commercial manufacturing of its products are custom and must be obtained from a specific sole source. The Company currently attempts to manage the risk associated with such sole source raw materials by active inventory management and supply agreements. Ligand attempts to remain appraised of the financial condition of its suppliers and their ability to supply the company's needs. Unavailability of certain materials from current sources could cause an interruption in production pending establishment of new sources, or in some cases, implementation of alternative processes.

QUALITY ASSURANCE

The Company's success depends in great measure upon customer confidence in

the quality of the Company's products and in the integrity of the data that support their safety and effectiveness. The quality of the Company's products arises from the total commitment to quality in all parts of the Company, including research and development, purchasing, manufacturing, and distribution. Quality-assurance procedures have been developed relating to the quality and integrity of the Company's scientific information and production processes.

Control of production processes involves rigid specifications for ingredients, equipment, and facilities, manufacturing methods, packaging materials, and labeling. Control tests are made at various stages of production processes and on the final product to assure that the product meets all regulatory requirements and the Company's standards. These tests may involve chemical and physical microbiological testing, preclinical testing, human clinical trials, or a combination of these trials.

SALES AND MARKETING

The Company recently developed a 26-person specialty cancer sales force in the United States in 1998 and early 1999. For markets outside Ligand's current marketing strategy, the Company will rely initially on other companies to distribute and market Panretin(R) gel and ONTAK(TM). A Canadian sales force, which has been in place since 1995, currently markets two in-licensed cancer products in Canada. In early 1999, Ligand established a subsidiary, Ligand Pharmaceuticals International, Inc., with a branch in London, England to

manage its European marketing and operations. For a discussion of the risks associated with sales and marketing see "Risks and Uncertainties."

RESEARCH AND DEVELOPMENT EXPENSES

Research and development expenses were $70.3 million, $72.4 million and $59.6 million in fiscal 1998, 1997 and 1996, respectively, of which approximately 75%, 29%, and 38%, was sponsored by the Company and the remainder of which was funded pursuant to product development collaboration arrangements. (See "Notes to Financial Statements.")

COMPETITION

Some of the drugs, which Ligand is developing, will compete with existing therapies. In addition, a number of companies are pursuing the development of novel pharmaceuticals, which target the same diseases that Ligand is targeting. A number of pharmaceutical and biotechnology companies are pursuing IR-related or STAT-related approaches to drug discovery and development. Furthermore, academic institutions, government agencies, and other public and private organizations conducting research may seek patent protection with respect to potentially competing products or technologies and may establish collaborative arrangements with competitors of Ligand.

Ligand's competitive position also depends upon its ability to attract and retain qualified personnel, obtain patent protection or otherwise develop proprietary products or processes and secure sufficient capital resources for the often substantial period between technological conception and commercial sales. For a discussion of the risks associated with competition see "Risks and Uncertainties."

GOVERNMENT REGULATION

The manufacturing and marketing of Ligand's products and its ongoing research and development activities are subject to regulation for safety and efficacy by numerous governmental authorities in the United States and other countries. In the United States, pharmaceuticals are subject to rigorous regulation by federal and various state authorities, including FDA. The Federal Food, Drug, and Cosmetic Act and the Public Health Service Act govern the testing, manufacture, safety, efficacy, labeling, storage, record keeping, approval, advertising and promotion of Ligand's products. There are often comparable regulations, which apply at the state level. Product development and approval within this regulatory framework takes a number of years and involves the expenditure of substantial resources.

The steps required before a pharmaceutical agent may be marketed in the United States include (1) preclinical laboratory tests, (2) the submission to

the FDA of an IND, which must become effective before human clinical trials may commence, (3) adequate and well-controlled human clinical trials to establish the safety and efficacy of the drug, (4) the submission of a NDA to the FDA and (5) the FDA approval of the NDA prior to any commercial sale or shipment of the drug. A company must pay a one-time user fee for NDA submissions, and annually pay user fees for each approved product and manufacturing establishment. In addition to obtaining FDA approval for each product, each domestic drug-manufacturing establishment must be registered with the FDA and in California, with the Food and Drug Branch of California. Domestic manufacturing establishments are subject to pre-approved inspections by the FDA prior to marketing approval and then to biennial inspections and must comply with current Good Manufacturing Practices ("cGMP"). To supply products for use in the United States, foreign manufacturing establishments must comply with cGMP and are subject to periodic inspection by the FDA or by regulatory authorities in such countries under reciprocal agreements with the FDA.

For both currently marketed and future products, failure to comply with applicable regulatory requirements after obtaining regulatory approval can, among other things, result in the suspension of regulatory approval, as well as possible civil and criminal sanctions. In addition, changes in existing regulations could have a material adverse effect on Ligand.

For marketing outside the United States before FDA approval to market, the Company must submit an export permit application to the FDA. The Company also will be subject to foreign regulatory requirements governing human clinical trials and marketing approval for drugs. The requirements relating to the conduct of clinical trials, product licensing, pricing and reimbursement vary widely from country to country and there can be no assurance that the Company or any of its partners will meet and sustain any such requirements. For a discussion of the risks associated with government regulations see "Risks and Uncertainties."

PATENTS AND PROPRIETARY RIGHTS

Ligand believes that patents and other proprietary rights are important to its business. Ligand's policy is to file patent applications to protect technology, inventions and improvements to its inventions that are considered important to the development of its business. Ligand also relies upon trade secrets, know-how, continuing technological innovations and licensing opportunities to develop and maintain its competitive position.

To date, Ligand has filed or participated as licensee in the filing of approximately 105 currently pending patent applications in the United States relating to Ligand's technology, as well as foreign counterparts of certain of these applications in many countries. In addition, Ligand owns or is the exclusive licensee to rights covered by approximately 250 patents issued, granted or allowed worldwide to Ligand, The Salk Institute, Baylor and other licensors. Subject to compliance with the terms of the respective agreements, Ligand's rights under its license with The Salk Institute and other exclusive licensors extend for the life of the patents covering such developments. For a discussion of the risks associated with patent and proprietary rights see "Risks and Uncertainties."

PRODUCT LIABILITY AND INSURANCE

Ligand's business exposes it to potential product liability risks, which are inherent in the testing, manufacturing and marketing of human drugs. Ligand has recently increased its product liability insurance in connection with the launching of two marketed drugs. The Company's product liability insurance also provides coverage for products in development and in clinical trials. However, there can be no assurance that Ligand will be able to maintain such insurance on acceptable terms or that such insurance will provide adequate coverage against potential liabilities. To the extent that Ligand's current product liability insurance, if available, does not cover potential claims, the Company will be required to self-insure the risks associated with such claims. A successful product liability claim or series of claims brought against the Company could have a material adverse effect on the Company. For a discussion of the risks associated with product liability see "Risks and Uncertainties."

HUMAN RESOURCES

As of December 31, 1998, Ligand had 418 full-time employees, of whom 295 were involved directly in scientific research and development activities. Of these employees, approximately 87 hold Ph.D. or M.D. degrees.

RISKS AND UNCERTAINTIES

The following is a summary description of some of the many risks we face in our business. You should carefully review these risks in evaluating our business and the businesses of our subsidiaries. You should also consider the other information described in this report.

OUR PRODUCT DEVELOPMENT AND COMMERCIALIZATION INVOLVES A NUMBER OF UNCERTAINTIES AND WE MAY NEVER GENERATE REVENUES FROM THE SALE OF PRODUCTS SUFFICIENT TO BECOME PROFITABLE.

We were founded in 1987 and have not generated any revenues from the sale of products that we or our collaborative partners have developed. To become profitable, we must successfully develop, clinically test, market and sell our products. In February 1999, we were granted FDA marketing approval for our first two products, Panretin(R) gel for the topical treatment of cutaneous AIDS-related KS, and ONTAK(TM) for the

treatment of patients with persistent or recurrent cutaneous CTCL whose malignant cells express the CD25 component of the IL-2 receptor.

Most of our other products will require extensive additional development, including preclinical testing and human studies, as well as regulatory approvals, before we can market them. We do not expect that any additional products resulting from our product development efforts or the efforts of our collaborative partners will be available for sale until the end of the 1999 calendar year at the earliest, if at all. There are many reasons that we may fail in our efforts to develop our other potential products, including the possibility that:

- we may discover during preclinical testing or human studies that they are ineffective or cause harmful side effects,

- the products may fail to receive necessary regulatory approvals from the FDA or other foreign authorities in a timely manner or at all,

- we may fail to produce the products, if approved, in commercial quantities or at reasonable costs, or

- the proprietary rights of other parties may prevent us from marketing the products.

We also will rely, at least initially, on another company to distribute our approved products and have only recently developed a sales force. Therefore, even though two of our products have been approved for marketing, we still may not be able to successfully market these products or potential products in the territories chosen for marketing.

SOME OF OUR KEY TECHNOLOGIES HAVE NOT BEEN USED TO PRODUCE MARKETED PRODUCTS AND MAY NOT BE CAPABLE OF PRODUCING SUCH PRODUCTS.

To date, we have dedicated most of our resources to the research and development of potential drugs based upon our expertise in what we refer to as our IR and STATs technologies. Even though certain marketed drugs act through IRs, some aspects of our IR technologies have not been used to produce marketed products. In addition, we are not aware of any drugs that have been developed and successfully commercialized that interact directly with STATs. Much remains to be learned about the location and function of IRs and STATs. If we are unable to apply our IR and STAT technologies to the development of our potential products, our business could be adversely affected.

WE HAVE A HISTORY OF OPERATING LOSSES AND AN ACCUMULATED DEFICIT WHICH MAY CONTINUE.

We have incurred significant losses since our inception in 1987. At December 31, 1998, our accumulated deficit was approximately $396.0 million. To date, we have received almost all of our revenues from our collaborative arrangements. We expect to incur additional losses as we continue our research

and development, testing and regulatory activities and as we establish manufacturing and sales and marketing capabilities.

OUR DRUG DEVELOPMENT PROGRAMS WILL REQUIRE SUBSTANTIAL ADDITIONAL FUTURE CAPITAL AND WE MAY NEED MORE CAPITAL.

Our drug development programs require substantial capital expenses, including expenses to:

- conduct research, preclinical testing and human studies,
- establish pilot scale and commercial scale manufacturing processes and facilities, and
- establish and develop quality control, regulatory, marketing, sales and administrative capabilities.

Our future capital needs will depend on many factors, including:

- the pace of scientific progress in our research and development programs and the magnitude of these programs,
- the scope and results of preclinical testing and human studies,
- the time and costs involved in obtaining regulatory approvals,

- the time and costs involved in preparing, filing, prosecuting, maintaining and enforcing patent claims,
- competing technological and market developments,
- our ability to establish additional collaborations,
- changes in our existing collaborations,
- the cost of manufacturing scale-up, and
- the effectiveness of our commercialization activities.

WE MAY NEVER ACHIEVE OR SUSTAIN PROFITABILITY.

To date, we have not generated any revenue from the sales of products we or our collaborative partners have developed. We may not be able to successfully develop, manufacture or market any products or ever achieve profitability. Moreover, even if we achieve profitability, we cannot predict the level of that profitability or whether we will be able to sustain profitability. We expect that our operating results will fluctuate from period to period as a result of differences in when we incur expenses and receive revenues from collaborative arrangements and other sources. Some of these fluctuations may be significant.

We believe our available cash, cash equivalents, marketable securities and existing sources of funding will be adequate to satisfy out anticipated capital requirements through 1999. Our future capital requirements will depend on many factors, including: (1) the pace of scientific progress in our research and development programs, (2) the magnitude of these programs, (3) the scope and results of preclinical testing and clinical trials, (4) the time and costs involved in obtaining regulatory approvals, (5) the costs involved in preparing, filing, prosecuting, maintaining and enforcing patent claims, (6) competing technological and market developments, (7) the ability to establish additional collaborations or changes in existing collaborations, (8) the cost of manufacturing scale-up and (9) the effectiveness of our commercialization activities.

WE MAY NOT BE ABLE TO PAY AMOUNTS DUE ON OUR OUTSTANDING INDEBTEDNESS.

We may not have sufficient cash to make required payments due under our existing debt. Our subsidiary, Glycomed, is obligated to make payments under certain debentures in the total principal amount of $50.0 million. The debentures bear interest at a rate of 7 1/2% per annum and are due in 2003. Glycomed may not have the funds necessary to pay the interest on and the principal of these debentures when due. If Glycomed does not have adequate funds, it will be forced to refinance the debentures and may not be successful

in doing so. In addition, in November 1998, we issued notes with a total issue price of $40.0 million to Elan. Glycomed's failure to make payments when due under its debentures would cause us to default under the notes we have issued or may issue to Elan.

WE MAY REQUIRE ADDITIONAL STOCK OR DEBT FINANCINGS TO FUND OUR OPERATIONS WHICH MAY NOT BE AVAILABLE ON ACCEPTABLE TERMS.

We have incurred losses since our inception and do not expect to generate positive cash flow to fund our operations for the 1999 calendar year and perhaps for one or more subsequent years. As a result, we may need to complete additional equity or debt financings in the near future to fund our operations. These financings may not be available on acceptable terms. In addition, these financings, if completed, still may not meet our capital needs and could result in substantial dilution to our stockholders. For instance, the notes we issued to Elan are convertible into common stock at the option of Elan, subject to some limitations. In addition, we may issue additional notes to Elan with up to a total issue price of $70.0 million, which also would be convertible into common stock. If adequate funds are not available, we may be required to delay, reduce the scope of or eliminate one or more of our drug development programs. Alternatively, we may be forced to attempt to continue development by entering into arrangements with collaborative partners or others that require us to relinquish some or all of our rights to certain technologies or drug candidates that we would not otherwise

relinquish. Our inability to obtain additional financing or to satisfy our obligations or the obligations of our subsidiaries under outstanding indebtedness could adversely affect our business.

WE NEED TO BUILD MARKETING AND SALES FORCES IN THE UNITED STATES AND EUROPE WHICH WILL BE AN EXPENSIVE AND TIME-CONSUMING PROCESS.

Developing the sales force to market and sell products is a difficult, expensive and time-consuming process. To market any of our products directly, we will need to either develop a marketing and sales force with technical expertise and distribution capability or contract with other companies with distribution systems and direct sales forces. We recently developed a sales force and will, at least initially, rely on another company to distribute our products. The distributor will be responsible for providing many marketing support services, including customer service, order entry, shipping and billing, and customer reimbursement assistance. In addition, in Canada we are the sole marketer of two cancer products other companies have developed. We may not be able to continue to establish and maintain the necessary sales and marketing capabilities. To the extent we enter into co-promotion or other licensing arrangements, any revenues we receive will depend on the marketing efforts of others, which may or may not be successful. Our failure to establish an effective sales force, either directly or through others, could adversely affect our business.

OUR SUCCESS WILL DEPEND ON THIRD-PARTY REIMBURSEMENT AND MAY BE IMPACTED BY HEALTH CARE REFORM.

The efforts of governments and third party payors to contain or reduce the cost of health care will continue to affect the business and financial condition of drug companies. A number of legislative and regulatory proposals to change the health care system have been discussed in recent years. In addition, an increasing emphasis on managed care in the United States has and will continue to increase pressure on drug pricing. We cannot predict whether legislative or regulatory proposals will be adopted or what effect those proposals or managed care efforts may have on our business. The announcement and/or adoption of such proposals or efforts could adversely affect our profit margins and business.

Sales of prescription drugs depend significantly on the availability of reimbursement to the consumer from third party payors, such as government and private insurance plans. These third party payors frequently require drug companies to provide predetermined discounts from list prices, and they are increasingly challenging the prices charged for medical products and services. If we succeed in bringing one or more products to the market, these products may not be considered cost-effective and reimbursement to the consumer may not be available or sufficient to allow us to sell our products on a competitive basis.

WE FACE SUBSTANTIAL COMPETITION WHICH WOULD HAVE AN ADVERSE EFFECT ON OUR

Some of the drugs that we are developing will compete with existing treatments. In addition, several companies are developing new drugs that target the same diseases that we are targeting and are taking IR-related and STAT-related approaches to drug development. Many of our existing or potential competitors, particularly large drug companies, have greater financial, technical and human resources than us and may be better equipped to develop, manufacture and market products. Many of these companies also have extensive experience in preclinical testing and human clinical trials, obtaining FDA and other regulatory approvals and manufacturing and marketing pharmaceutical products. In addition, academic institutions, governmental agencies and other public and private research organizations are developing products that may compete with the products we are developing. These institutions are becoming more aware of the commercial value of their findings and are seeking patent protection and licensing arrangements to collect payments for the use of their technologies. These institutions also may market competitive products on their own or through joint ventures and will compete with us in recruiting highly qualified scientific personnel. Any of these companies, academic institutions, government agencies or research organizations may develop and introduce products and processes that compete with or are better than ours. As a result, our products may become noncompetitive or obsolete.

The products we are developing target a broad range of markets. Our ability to compete will depend on the uses for which our products are developed and ultimately approved by regulatory authorities. For some of our potential products, an important factor in competition may be the timing of market introduction.

Important competitive factors include the speed at which we develop products, complete the clinical trials and regulatory approval processes, and commercialize the products. In addition, we expect that competition among products approved for sale will be based on product safety, effectiveness, reliability, availability, and price and patent position. Our competitive position also will depend on whether we can attract and retain qualified personnel, obtain patent protection or otherwise develop proprietary products or processes, and secure sufficient capital resources.

OUR PRODUCTS MUST CLEAR SIGNIFICANT REGULATORY HURDLES PRIOR TO MARKETING.

Before we obtain the approvals necessary to sell any of our potential products, we must show through preclinical studies and clinical trials that each product is safe and effective. Our failure to show any product's safety and effectiveness would delay or prevent regulatory approval of the product and could adversely affect our business. The clinical trials process is complex and uncertain. The results of preclinical studies and initial clinical trials may not necessarily predict the results from later large-scale clinical trials. In addition, clinical trials may not demonstrate a product's safety and effectiveness to the satisfaction of the regulatory authorities. A number of companies have suffered significant setbacks in advanced clinical trials or in seeking regulatory approvals, despite promising results in earlier trials. The FDA may also require additional clinical trials post approval, which could be expensive and time-consuming, and failure to successfully conduct those trials could jeopardize continued commercialization.

The rate at which we complete our clinical trials depends on many factors, including our ability to obtain adequate clinical supplies and patient enrollment. Patient enrollment is a function of many factors, including the size of the patient population, the proximity of patients to clinical sites and the eligibility criteria for the trial. Delays in patient enrollment may result in increased costs and longer development times. In addition, some of our collaborative partners have rights to control product development and clinical programs for products developed under the collaborations. As a result, these collaborators may conduct these programs more slowly or in a different manner than we had expected. Even if clinical trials are completed, we or our collaborative partners still may not apply for FDA approval in a timely manner or the FDA still may not grant approval.

WE RELY HEAVILY ON COLLABORATIVE RELATIONSHIPS AND TERMINATION OF ANY OF THESE PROGRAMS COULD HAVE AN ADVERSE EFFECT ON OUR BUSINESS.

Our strategy for developing and commercializing many of our potential products includes entering into collaborations with corporate partners, licensors, licensees and others. To date, we have entered into collaborations with Lilly, SmithKline Beecham, American Home Products, Abbott, Sankyo, Glaxo-Wellcome, Allergan and Pfizer. These collaborations provide us with funding and research and development resources for potential products for the treatment or control of metabolic diseases, hematopoiesis, women's health disorders, inflammation, cardiovascular disease, cancer and skin disease, and osteoporosis. These agreements also give our collaborative partners significant discretion when deciding whether or not to pursue any development program. We cannot be certain that our collaborations will continue or be successful.

In addition, our collaborators may develop drugs, either alone or with others that compete with the types of drugs they currently are developing with us. This would result in less support and increased competition for our programs. If products are approved for marketing under our collaborative programs, any revenues we receive will depend on the manufacturing, marketing and sales efforts of our collaborators, who generally retain commercialization rights under the collaborative agreements. Our current collaborators also generally have the right to terminate their collaborations under certain circumstances. If any of our collaborative partners breach or terminate their agreements with us or otherwise fail to conduct their collaborative activities successfully, our product development under these agreements will be delayed or terminated. The delay or termination of any of the collaborations could adversely affect our business.

We may have disputes in the future with our collaborators, including disputes concerning who owns the rights to any technology developed. For instance, we were involved in litigation with Pfizer, which we settled in April 1996, concerning our right to milestones and royalties based on the development and commercialization

of droloxifene. These and other possible disagreements between us and our collaborators could delay our ability and the ability of our collaborators to achieve milestones or our receipt of other payments. In addition, any disagreements could delay, interrupt or terminate the collaborative research, development and commercialization of certain potential products, or could result in litigation or arbitration. The occurrence of any of these problems could be time-consuming and expensive and could adversely affect our business.

OUR SUCCESS DEPENDS ON OUR ABILITY TO OBTAIN AND MAINTAIN OUR PATENTS AND OTHER PROPRIETARY RIGHTS.

Our success will depend on our ability and the ability of our licensors to obtain and maintain patents and proprietary rights for our potential products and to avoid infringing the proprietary rights of others, both in the United States and in foreign countries. Patents may not be issued from any of these applications currently on file or, if issued, may not provide sufficient protection. In addition, if we breach our licenses, we may lose rights to important technology and potential products.

Our patent position like that of many pharmaceutical companies, is uncertain and involves complex legal and technical questions for which important legal principles are unresolved. We may not develop or obtain rights to products or processes that are patentable. Even if we do obtain patents, they may not adequately protect the technology we own or have licensed. In addition, others may challenge, seek to invalidate, infringe or circumvent any patents we own or license, and rights we receive under those patents may not provide competitive advantages to us. Further, the manufacture, use or sale of our products may infringe the patent rights of others.

Several drug companies and research and academic institutions have developed technologies, filed patent applications or received patents for technologies that may be related to our business. Others have filed patent applications and received patents that conflict with patents or patent applications we have licensed for our use, either by claiming the same methods or compounds or by claiming methods or compounds that could dominate those licensed to us. In addition, we may not be aware of all patents or patent applications that may impact our ability to make, use or sell any of our potential products. For example, United States patent applications are confidential while pending in the Patent and Trademark Office, and patent

applications filed in foreign countries are often first published six months or more after filing. Any conflicts resulting from the patent rights of others could significantly reduce the coverage of our patents and limit our ability to obtain meaningful patent protection. If other companies obtain patents with conflicting claims, we may be required to obtain licenses to those patents or to develop or obtain alternative technology. We may not be able to obtain any such license on acceptable terms or at all. Any failure to obtain such licenses could delay or prevent us from pursuing the development or commercialization of our potential products, which would adversely affect our business.

We have had and will continue to have discussions with our current and potential collaborators regarding the scope and validity of our patent and other proprietary rights. If a collaborator or other party successfully establishes that our patent rights are invalid, we may not be able to continue our existing collaborations beyond their expiration. Any determination that our patent rights are invalid also could encourage our collaborators to terminate their agreements where contractually permitted. Such a determination could also adversely affect our ability to enter into new collaborations.

We may also need to initiate litigation, which could be time-consuming and expensive, to enforce our proprietary rights or to determine the scope and validity of others' rights. If litigation results, a court may find our patents or those of our licensors invalid or may find that we have infringed on a competitor's rights. If any of our competitors have filed patent applications in the United States which claim technology we also have invented, the Patent and Trademark Office may require us to participate in expensive interference proceedings to determine who has the right to a patent for the technology.

We have learned that Hoffman LaRoche, Inc. has received a United States patent and has made patent filings in foreign countries that relate to our Panretin(R) capsules and gel products. We filed a patent application with an earlier filing date than Hoffman LaRoche's patent, which we believe is broader than, but overlaps in part with, Hoffman LaRoche's patent. We currently are investigating the scope and validity of Hoffman LaRoche's patent to determine its impact upon our products. The Patent and Trademark Office has informed

us that the overlapping claims are patentable to us and has initiated a proceeding to determine whether we or Hoffman LaRoche are entitled to a patent. We may not receive a favorable outcome in the proceeding. In addition, the proceeding may delay the Patent and Trademark Office's decision regarding our earlier application. While we believe that the Hoffman LaRoche patent does not cover the use of Panretin(R) capsules and gel for most of our planned uses, if we do not prevail, the Hoffman LaRoche patent might block our use of Panretin(R) capsules and gel in certain cancers.

We also rely on unpatented trade secrets and know-how to protect and maintain our competitive position. We require our employees, consultants, collaborators and others to sign confidentiality agreements when they begin their relationship with us. These agreements may be breached and we may not have adequate remedies for any breach. In addition, our competitors may independently discover our trade secrets. Any of these actions might adversely affect our business.

WE CURRENTLY HAVE LIMITED MANUFACTURING CAPABILITY AND WILL RELY ON THIRD-PARTY MANUFACTURERS.

We currently have no manufacturing facilities outside of Marathon's facility and rely on Marathon and others for clinical or commercial production of our potential products. To be successful, we will need to manufacture our products, either directly or through others, in commercial quantities, in compliance with regulatory requirements and at acceptable cost. If we are unable to develop our own facilities or contract with others for manufacturing services, our ability to conduct preclinical testing and human clinical trials will be adversely affected. This in turn could delay our submission of products for regulatory approval and our initiation of new development programs. In addition, although other companies have manufactured drugs acting through IRs and STATs on a commercial scale, we may not be able to do so at costs or in quantities to make marketable products. Any of these events would adversely affect our business.

Our manufacturing process also may be susceptible to contamination, which could cause the affected manufacturing facility to close until the contamination

is identified and fixed. In addition, problems with equipment failure or operator error also could cause delays. Any extended and unplanned manufacturing shutdowns could be expensive and could result in inventory and product shortages.

OUR BUSINESS EXPOSES US TO PRODUCT LIABILITY RISKS AND WE MAY NOT HAVE SUFFICIENT INSURANCE TO COVER ANY CLAIMS.

Our business exposes us to potential product liability risks. A successful product liability claim or series of claims brought against us could adversely affect our business. Some of the compounds we are investigating may be harmful to humans. For example, retinoids as a class are known to contain compounds, which can cause birth defects. We have arranged to increase our product liability insurance coverage in connection with the planned launch of two of our potential products; however, we may not be able to maintain our insurance on acceptable terms, or our insurance may not provide adequate protection in the case of a product liability claim. We expect to purchase additional insurance when more of our products progress to a later stage of development and if we license any rights to use later-stage products in the future. To the extent that product liability insurance, if available, does not cover potential claims, we will be required to self-insure the risks associated with such claims.

WE ARE DEPENDENT ON OUR KEY EMPLOYEES, THE LOSS OF WHOSE SERVICES COULD ADVERSELY AFFECT US.

We depend on our key scientific and management staff, the loss of whose services could adversely affect our business. Furthermore, we are currently experiencing a period of rapid growth, which requires us to hire many new scientific, management and operational personnel. Accordingly, recruiting and retaining qualified management, operations and scientific personnel to perform research and development work also is critical to our success. Although we believe we will successfully attract and retain the necessary personnel, we may not be able to attract and retain such personnel on acceptable terms given the competition among numerous drug companies, universities and other research institutions for such personnel.

WE USE HAZARDOUS MATERIALS WHICH REQUIRES US TO INCUR SUBSTANTIAL COSTS TO COMPLY WITH ENVIRONMENTAL REGULATIONS.

In connection with our research and development activities, we handle hazardous materials, chemicals and various radioactive compounds. For example, as we previously mentioned, retinoids as a class are known to contain compounds, which can cause birth defects. We cannot completely eliminate the risk of accidental contamination or injury from the handling and disposing of hazardous materials. In the event of any accident, we could be held liable for any damages that result, which could be significant. In addition, we may incur substantial costs to comply with environmental regulations. Any of these events could adversely affect our business.

OUR STOCK PRICE MAY BE ADVERSELY AFFECTED BY VOLATILITY IN THE MARKETS.

The market prices and trading volumes for our securities, and the securities of emerging companies like us, have historically been highly volatile and have experienced significant fluctuations unrelated to operating performance. Future announcements concerning us or our competitors may impact the market price of our common stock. These announcements might include the results of research, development testing, technological innovations, new commercial products, government regulation, receipt of regulatory approvals by competitors, our failure to receive regulatory approvals, developments concerning proprietary rights, litigation or public concern about the safety of the products.

YOU MAY NOT RECEIVE A RETURN ON YOUR SHARES OTHER THAN THROUGH THE SALE OF YOUR SHARES OF COMMON STOCK.

We have not paid any cash dividends on our common stock to date, and we do not anticipate paying cash dividends in the foreseeable future. Accordingly, other than through a sale of your shares, you may not receive a return.

OUR CHARTER DOCUMENTS AND SHAREHOLDER RIGHTS PLAN MAY PREVENT TRANSACTIONS THAT COULD BE BENEFICIAL TO YOU.

Our shareholder rights plan and certain provisions contained in our certificate of incorporation and bylaws may discourage transactions involving an actual or potential change in our ownership, including transactions in which you might otherwise receive a premium for your shares over then-current market prices. These provisions also may limit your ability to approve transactions that you deem to be in your best interests. In addition, our board of directors may issue shares of preferred stock without any further action by you. Such issuances may have the effect of delaying or preventing a change in our ownership.

WE ARE SUBJECT TO YEAR 2000 RISKS FOR WHICH WE MAY NOT BE PREPARED AND WHICH COULD HAVE AN ADVERSE EFFECT ON OUR BUSINESS.

For a discussion of the risks associated with our year 2000 readiness, please see "Management's Discussion and Analysis of Financial Condition and Results of Operations -- Year 2000 Compliance."

ITEM 2. PROPERTIES

Ligand currently leases and occupies three facilities in San Diego, California, and one facility in Hopkinton, Massachusetts.

In July 1994, the Company entered into a 20-year lease related to the construction of a new build-to-suit laboratory facility. This 52,800 square foot facility was completed and occupied in August 1995. In March 1997, the Company entered into a 17-year lease for laboratory and administrative office space for a second build-to-suit facility. This 82,000 square foot facility was completed and occupied in December 1997. The third facility in San Diego is occupied under a lease of approximately 7,500 square feet of laboratory space, which continues through February 2001.

In January 1999, Ligand purchased all the assets of Marathon Biopharmaceuticals in Hopkinton, Massachusetts. Marathon has 13 years remaining on a lease for a 64,000 square foot facility which is used for manufacturing and administrative office space.

The Company believes these facilities will be adequate to meet the Company's near-term space requirements.

ITEM 3. LEGAL PROCEEDINGS

From time to time the Company is a party to litigation arising in the normal course of business. As of the date of the filing, the Company is not a party to any litigation which would have a material effect on its financial position or business operations taken as a whole.

On August 4, 1998, a lawsuit was filed in the Court of Chancery of the State of Delaware which sought to enjoin the acquisition of Seragen by Ligand. The injunction was denied and the acquisition occurred on August 12, 1998. An amended complaint was filed on or about December 18, 1998 against Seragen, Seragen Technology, Inc., certain former directors and officers and Seragen investors, Boston University and certain of its trustees, Marathon Biopharmaceuticals L.L.C., Ligand and Knight Acquisition Corp., a wholly owned subsidiary of Ligand at the time of the merger with Seragen ("Knight"). Ligand and Knight were not named as defendants in the original complaint. The amended complaint alleges claims of self-dealing and breach of fiduciary duties of disclosure, loyalty and care by the individual defendants and Seragen investors, and seeks damages on behalf of a class of shareholders who purchased Seragen common stock during the period April 1992 through August 12, 1998. The lawsuit also challenges the fairness of Ligand's acquisition of Seragen, and the allocation of the merger proceeds among the individual defendants, Seragen's investors and minority shareholders. We believe that the lawsuit is without merit and intend to defend against it vigorously.

ITEM 4. SUBMISSION OF MATTERS TO A VOTE OF SECURITY HOLDERS

There were no matters submitted to a vote of security holders in the fourth quarter ended December 31, 1998.

PART II

ITEM 5. MARKETS FOR REGISTRANT'S COMMON STOCK AND RELATED STOCKHOLDERS MATTERS

(A) MARKET INFORMATION

The Company's common stock trades on the Nasdaq National Market tier of the Nasdaq Stock Market under the symbol "LGND." The following table sets forth the high and low sales prices for the Company's common stock on the Nasdaq National Market for the periods indicated.

<TABLE>
<CAPTION>

	PRICE RANGE	
	HIGH	LOW
<S>	<C>	<C>
YEAR ENDING DECEMBER 31, 1997:		
1st Quarter	$17	$10 1/4
2nd Quarter	14 1/2	9 1/8
3rd Quarter	17 3/4	11 5/8
4th Quarter	18 3/8	11 1/4
YEAR ENDING DECEMBER 31, 1998:		
1st Quarter	$16 5/8	$10 7/8
2nd Quarter	16 3/8	12 1/8
3rd Quarter	13 1/4	5 1/2
4th Quarter	12 3/8	6 15/16

</TABLE>

(B) HOLDERS

As of February 28, 1999, there were approximately 1,944 holders of record of the common stock.

(C) DIVIDENDS

The Company has never declared or paid any cash dividends on its capital stock and does not intend to pay any cash dividends in the foreseeable future. The Company currently intends to retain its earnings, if any, to finance future growth. The Company has no contractual restrictions on paying dividends.

(D) RECENT SALES OF UNREGISTERED SECURITIES

None.

ITEM 6. SELECTED CONSOLIDATED FINANCIAL DATA

The selected financial data set forth below with respect to the Company's consolidated financial statements has been derived from the audited financial statements. The data set forth below should be read in conjunction with "Management's Discussion and Analysis of Financial Condition and Results of Operations" and the Company's consolidated financial statements and related notes included elsewhere in this filing.

<TABLE>
<CAPTION>

	YEARS ENDED DECEMBER 31,				
	1998	1997	1996	1995	1994
	(IN THOUSANDS, EXCEPT NET LOSS PER SHARE DATA)				
<S>	<C>	<C>	<C>	<C>	<C>
CONSOLIDATED STATEMENT OF OPERATIONS DATA:					
Revenues:					
Collaborative research and development					
Related parties	$ --	$ 18,997	$ 18,641	$ 11,972	$ 8,342

Unrelated parties	17,267	32,284	17,994	12,424	4,893
Other	406	418	207	120	74
Total revenues	17,673	51,699	36,842	24,516	13,309
Costs and expenses:					
Research and development	70,739	72,426	59,494	41,636	27,205
Selling, general and administrative	16,568	10,108	10,205	8,181	6,957
Write-off of acquired in-process technology	45,000	64,970	--	19,564	--
ALRT contribution	--	--	--	17,500	--
Total operating expenses	132,307	147,504	69,699	86,881	34,162
Loss from operations	(114,634)	(95,805)	(32,857)	(62,365)	(20,853)
Interest income	3,070	3,743	3,704	3,603	1,298
Interest expense	(8,322)	(8,088)	(8,160)	(5,410)	(679)
Realized gain on sale of investments	2,000	--	--	--	--
Equity in operations of joint venture	--	--	--	--	(6,845)
Net loss	$ (117,886)	$ (100,150)	$ (37,313)	$ (64,172)	$ (27,079)
Basic and diluted net loss per Share	$ (2.92)	$ (3.02)	$ (1.30)	$ (2.70)	$ (1.57)
Shares used in computing net loss per share	40,392,421	33,128,372	28,780,914	23,791,542	17,240,535

	AT DECEMBER 31,				
	1998	1997	1996	1995	1994
	(IN THOUSANDS)				
CONSOLIDATED BALANCE SHEET DATA:					
Cash, cash equivalents, short term investments and restricted cash	$ 72,521	$ 86,287	$ 84,179	$ 76,903	$ 38,403
Working capital	51,098	62,399	71,680	57,349	33,567
Total assets	156,020	107,423	102,140	93,594	46,696
Long-term debt	51,185	14,751	19,961	18,585	12,285
Convertible subordinated debentures	39,302	36,628	33,953	31,279	--
Accumulated deficit	(395,630)	(277,744)	(177,594)	(140,281)	(76,108)
Total stockholders' equity (deficit)	(11,362)	34,349	34,461	28,071	26,335

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITIONS AND RESULTS OF OPERATIONS

This annual report on Form 10-K may contain predictions, estimates and other forward-looking statements that involve a number of risks and uncertainties, including those discussed in Item 1 above at "Risks and Uncertainties." This outlook represents our current judgment on the future direction of our business. Any risks and uncertainties could cause actual results to differ materially from any future performance suggested below. We undertake no obligation to release publicly the results of any revisions to these forward-looking statements to reflect events or circumstances arising after the date of this annual report.

OVERVIEW

Since January 1989, we have devoted substantially all of our resources to our intracellular receptor and signal transducers and activators of

transcription drug discovery and development programs. We have been unprofitable since our inception. We expect to incur substantial additional operating losses until the approval and commercialization of our products, begun in 1999, generate sufficient revenues to cover our expenses. These losses will be due to continued capital requirements for: (1) research and development, (2) preclinical testing, (3) clinical trials, (4) regulatory activities (5) establishment of manufacturing processes and (6) sales and marketing capabilities. We expect that our operating results will fluctuate from period to period as a result of differences in the timing of expenses incurred and revenues earned from collaborative arrangements and future product sales. Some of these fluctuations may be significant. As of December 31, 1998, our accumulated deficit was $395.6 million.

In February 1999, the FDA granted us marketing approval for our first two products, Panretin(R) gel for the treatment of patients with cutaneous AIDS-related Kaposi's sarcoma and ONTAK(TM) for the treatment of patients with persistent or recurrent cutaneous CTCL whose malignant cells express the CD25 component of the IL-2 receptor.

In August 1998, we completed a merger with Seragen, Inc. We currently operate Seragen as one of our subsidiaries. Also, in August 1998, Seragen signed an agreement with Eli Lilly and Company and us under which Lilly assigned to us Lilly's rights and obligations under its agreements with Seragen, including its sales and marketing rights to ONTAK(TM).

We paid Seragen shareholders $30.0 million, $4.0 million of which was in cash and $26.0 million of which was in the form of approximately 1,858,515 shares of common stock. We must pay an additional $37.0 million to Seragen shareholders in cash and/or common stock, at our option. The additional payment must be made in August 1999.

Additionally, our agreement with Lilly calls for up to $5.0 million, payable in cash or common stock, at our option, in milestone payments to Lilly, upon ONTAK(TM) approval by the FDA. Upon certain other events, Lilly could receive an additional $5.0 million in milestone payments.

In January 1999, we purchased substantially all of the assets of Marathon Biopharmaceuticals for $5.0 million through the issuance of 402,820 shares of our common stock, at $12.41 per share with an additional $3.0 million to be paid in August 1999.

The transactions with Seragen shareholders, Marathon, and Lilly represent our cost to acquire all of the rights to manufacture, market and sell ONTAK(TM), and we accounted for using the purchase method of accounting. The purchase price, totaling $84.1 million, which includes liabilities assumed of $2.3 million was allocated to the fair value of the assets acquired. This included an allocation to in-process technology which was written off, resulting in a one-time non-cash charge to results of operations of approximately $30.0 million.

In September 1998, we signed a binding letter of agreement with Elan Corporation, plc. In September 1998, Elan purchased 1,278,970 shares of common stock for $14.9 million ($11.65 per share). In November 1998, Elan purchased an additional 437,768 shares for $5.1 million ($11.65 per share).

In addition, in November 1998, Elan purchased from us $40.0 million in issue price of zero coupon convertible senior notes, due 2008 with an 8.0% per annum yield to maturity. Of these notes, $30.0 million are convertible into common stock at $14.00 per share. The balance issued of $10.0 million along with up to an

additional $70.0 million of notes which Elan may also purchase in the future is convertible into common stock. The conversion price is determined by the average of the closing prices of common stock for the 20 trading days immediately prior to the issuance of a note plus a premium. However, the conversion price will never be less than $14.00 per share or more than $20.00 per share. Interest will accrue during the term of the notes. The notes may be used to finance the final payments for the Seragen merger and Marathon acquisition which are due in August 1999, as well as other acquisitions of complementary technologies, subject to the consent of Elan.

Elan also exclusively licensed to us in the United States and Canada its

proprietary product Morphelan(TM). At the closing, we paid Elan $5.0 million through the issuance of 429,185 shares of common stock ($11.65 per share) and $10.0 million through the issuance of notes for these rights to Morphelan(TM). The total $15.0 in million payments was written off as in-process technology in a one-time charge to operations. We will also pay Elan milestone payments upon the occurrence of certain events up to and including the approval of the new drug application in the United States. These payments may be in cash or, subject to certain conditions, in common stock or notes.

In December 1994, we formed Allergan Ligand Retinoid Therapeutics, Inc. with Allergan, Inc. to continue the research and development activities previously conducted by a joint venture with Allergan. In June 1995, Allergan Ligand and we completed a public offering of 3,250,000 units with aggregate proceeds of $32.5 million and cash contributions by Allergan of $50.0 million and by us of $17.5 million. Allergan Ligand received net proceeds of $94.3 million for retinoid product research and development. Each unit consisted of one share of Allergan Ligand callable common stock and two warrants, each warrant entitling the holder to purchase one share of our common stock. In September 1997, we exercised our option to purchase all of the callable common stock. At the same time, Allergan exercised its option to purchase certain assets of Allergan Ligand. Our exercise of the stock purchase option required the issuance of 3,166,567 shares of our common stock, along with cash payments totaling $25.0 million, to holders of the callable common stock in November 1997. Allergan made a cash payment of $8.9 million to Allergan Ligand in November 1997, which was used by us to pay a portion of the stock purchase option. Prior to September 1997, cash received from Allergan Ligand was recorded as contract revenue. As a result of our exercise of the stock purchase option, research expenditures incurred related to Allergan Ligand activities are no longer reimbursed, eliminating the Allergan Ligand contract revenue recognition. The buyback of Allergan Ligand was accounted for using the purchase method of accounting. The excess of the purchase price over the fair value of net assets acquired was allocated to in-process technology and written off resulting in a one time non-cash charge to operations of $65.0 million in 1997.

RESULTS OF OPERATIONS

YEAR ENDED DECEMBER 31, 1998 ("1998"), AS COMPARED TO THE YEAR ENDED DECEMBER 31, 1997 ("1997")

We had revenues of $17.7 million for 1998 compared to revenues of $51.7 million for 1997. The decrease in revenues is primarily due to: (1) the buyback of Allergan Ligand which resulted in reduced revenue of $19.0 million in 1998 compared to 1997, (2) completion of the Glaxo-Wellcome, plc and Sankyo Company Ltd. collaborations in 1997 resulting in reduced revenues in 1998 of $1.3 million for Glaxo and $2.3 million for Sankyo compared to 1997, (3) completion of the American Home Products Corporation collaboration in 1998 resulting in reduced revenue of $2.7 million compared to 1997 and (4) a reduction in revenue from Lilly of $9.3 million. The Lilly reduction was due to a $12.5 million up-front non refundable milestone payment received in 1997 and $6.25 million which was recognized in 1997 revenue upon the execution of the Lilly collaboration agreement, offset by a full year of collaboration revenue from Lilly recognized in 1998. Revenues in 1998 were derived from the Company's research and development agreements with: (1) Lilly of $10.4 million, (2) SmithKline Beecham Corporation of $3.7 million, (3) American Home Products of $1.3 million (4) Abbott Laboratories of $1.2 million, as well as from product sales of in-licensed products by our Canadian subsidiary of $406,000 and a one-time license fee payment of $686,000. Revenues for 1997 were derived from our research and development agreements with: (1) Lilly of $19.7 million (2) Allergan Ligand of $19.0 million, (3) American Home Products of $4.0 million, (4) SmithKline Beecham of $3.2 million,

(5) Sankyo of $2.3 million, (6) Abbott of $1.7 million, (7) Glaxo-Wellcome of $1.3 million, as well as from product sales of in-licensed products by our Canadian subsidiary of $418,000.

For 1998, research and development expenses decreased to $70.7 million from $72.4 million in 1997. The decrease in expenses was primarily due to initial drug product validation costs incurred in 1997 and the closure of Glycomed's Alameda facility and completion of the research portion of the Sankyo collaboration in October 1997. The decrease in these expenses was offset by an increase in expenses related to completion of Phase III trials and NDA

preparation and submission for our lead product candidates. Selling, general and administrative expenses increased to $16.6 million in 1998 from $10.1 million in 1997. This increase was primarily attributable to personnel additions and increased expenses in preparation for commercialization activities. Interest income decreased to $3.1 million in 1998 from $3.7 million in 1997 due to the use of cash to fund development and clinical programs and to support the growth in commercialization activities, offset by cash received from the Elan notes and the $20.0 million equity investment by Elan in second half of 1998. Interest expense increased to $8.3 million in 1998 from $8.1 million in 1997. The increase is due to interest payable in connection with the receipt of the Elan notes. A $2.0 million gain was realized from the sale of investment securities in 1998.

A one-time charge of $30.0 million for in process technology was incurred in 1998 from the merger with Seragen, and an additional one-time charge of $15.0 million related to the licensing of Morphelan(TM) from Elan.

We have significant net operating loss carryforwards for federal and state income taxes which are available subject to Internal Revenue Code Sections 382 and 383 carryforward limitations. We do not believe the limitations will have a material impact upon the future utilization of these carryforwards. See note 13 to our consolidated financial statements included elsewhere in this annual report.

YEAR ENDED DECEMBER 31, 1997 ("1997"), AS COMPARED TO THE YEAR ENDED DECEMBER 31, 1996 ("1996")

We had revenues of $51.7 million for 1997 compared to revenues of $36.8 million for 1996. The increase in revenues is primarily due to the Lilly collaboration revenues of $19.7 million in 1997, offset by decreased revenues from the research and development collaboration with American Home Products, due to a one-time payment of $1.5 million in 1996, which expanded and amended the research and development agreement, as well as a $1.3 million milestone payment received from Pfizer Inc. in 1996. Revenues in 1997 were derived from our research and development agreements as discussed above. Revenues for 1996 were derived from our research and development agreements with: (1) Allergan Ligand of $18.6 million, (2) American Home Products of $6.9 million, (3) Sankyo of $2.7 million, (4) Abbott of $2.5 million, (5) SmithKline Beecham of $2.4 million, (6) Glaxo-Wellcome of $2.1 million as well as from a milestone payment received from Pfizer of $1.3 million, product sales of in-licensed products by our Canadian subsidiary of $207,000 and revenues from a National Institutes of Health grant of $99,000.

For 1997, research and development expenses increased to $72.4 million from $59.5 million in 1996. These expenses increased primarily due to expansion of our clinical and development activities, as well as related additions of clinical and development personnel. Selling, general and administrative expenses decreased to $10.1 million in 1997 from $10.2 million in 1996. The decrease was primarily attributable to higher legal expenses incurred in 1996 related to the settlement of future product rights litigation offset by additions to personnel in 1997 to support expanded clinical and development activities. Interest income was $3.7 million for 1997 and 1996. Interest expense decreased slightly to $8.1 million for 1997, from $8.2 million in 1996, due to conversion of $7.5 million convertible notes from American Home Products to equity in 1997, offset by the addition of $2.5 million of convertible notes from SmithKline Beecham in 1997 and increases in capital lease obligations used to finance equipment.

A one-time charge of $65.0 million was incurred in 1997 for the write off of in-process technology related to the exercise of the Allergan Ligand stock purchase option.

LIQUIDITY AND CAPITAL RESOURCES

We have financed our operations through private and public offerings of our equity securities, collaborative research revenues, capital and operating lease transactions, issuance of convertible notes, investment income and product sales. From inception through December 31, 1998, we have raised cash proceeds of $234.4 million from sales of equity securities: $78.2 million from public offerings and a total of $156.2 million from private placements and the exercise of options and warrants.

As of December 31, 1998, we had acquired a total of $36.5 million in property, laboratory and office equipment (including Marathon) and $5.0 million in tenant leasehold improvements. Of these totals, $7.9 million was recorded in the merger with Seragen and will be paid in cash or common stock, at the Company's option, while substantially all of the balance has been funded through capital lease and equipment note obligations. In addition, we lease our office and laboratory facilities. In July 1994, we entered into a long-term lease related to the construction of a new laboratory facility, which was completed and occupied in August 1995. In March 1997, we entered into a long-term lease, related to a second build-to-suit facility and loaned the construction partnership $3.7 million at an annual interest rate of 8.5% which will be paid back monthly over a 10-year period. The second build-to-suit facility was completed and occupied in December 1997. In February 1997, the Company signed a master lease agreement to finance future capital equipment up to $1.5 million. This master lease agreement was expanded and extended in July 1997 and again in December 1998 and is currently available until March 31, 2000. Each individual schedule under the master lease agreement will be paid back monthly with interest over a five-year period. As of December 31, 1998, we had $4.5 million available to finance future capital equipment.

Working capital decreased to $51.1 million as of December 31, 1998, from $62.4 million at the end of 1997. The decrease in working capital resulted from a decrease in cash and increases in accounts payable and accruals at year end 1998, due to increases in clinical trials, product development expenses and increased selling expenses in preparation for commercialization activities. This decrease in working capital was offset by the $20.0 million equity investment by Elan in the second half of 1998 and $30 million in the notes received from Elan in November 1998. For the same reasons, cash and cash equivalents, short-term investments and restricted cash decreased to $72.5 million at December 31, 1998 from $86.3 million at December 31, 1997. We primarily invest our cash in United States government and investment grade corporate debt securities.

In April 1998, we initiated a new collaboration with SmithKline Beecham to develop small molecule drugs for the treatment or prevention of obesity. As part of the collaboration, SmithKline Beecham purchased 274,423 shares of common stock for $5.0 million ($18.22 per share), a 20% premium over a 15-day average of the daily closing price of common stock prior to execution of the agreement. The premium has been deferred and will be recognized as revenue over the two-year period in which services will be provided under the collaborative agreement. SmithKline Beecham also purchased for $1.0 million a warrant to purchase 150,000 shares of common stock at $20.00 per share. The warrant expires in five years, and we may require SmithKline Beecham to exercise the warrant under certain circumstances after three years. SmithKline Beecham will also purchase additional common stock at a 20% premium if a certain research milestone is achieved and will make cash payments to us if subsequent milestones are met.

In June 1998, we converted $3.8 million of the convertible notes outstanding to American Home Products into 374,625 shares of common stock at a $10.01 conversion price.

In August 1998, we paid Seragen shareholders $30.0 million, $4.0 million of which was cash and $26.0 million of which was in the form of approximately 1,858,515 shares of common stock. We must pay an additional $37.0 million to Seragen shareholders in cash and/or common stock, at our option. The additional payment must be made in August 1999.

In January 1999, we purchased substantially all of the assets of Marathon Biopharmaceuticals for $5.0 million through the issuance of 402,820 shares of our common stock, at $12.41 per share with an additional $3.0 million to be paid in August 1999.

In September 1998, Elan purchased 1,278,970 shares of common stock for $14.9 million ($11.65 per share). An additional 437,768 shares for $5.1 million ($11.65 per share) was purchased by Elan in November

1998. Elan also purchased from us in November 1998 $40.0 million in issue price of notes. At our option, Elan may also purchase up to an additional $70.0 million of notes which will be convertible into common stock at $14.00 to $20.00 per share.

Elan also exclusively licensed to us in the United States and Canada its

proprietary product Morphelan(TM). At the closing, we paid Elan $5.0 million through the issuance of 429,185 shares of common stock ($11.65 per share) and $10.0 million through the issuance of notes for these rights to Morphelan(TM). The total $15.0 million payment was written off as in-process technology in a one-time charge to operations. We will also pay Elan milestone payments upon the occurrence of certain events up to and including the approval of the new drug application in the United States. These payments may be in cash or, subject to certain conditions, in common stock or notes

We believe our available cash, cash equivalents, marketable securities and existing sources of funding will be adequate to satisfy our anticipated capital requirements through 1999. Our future capital requirements will depend on many factors, including: (1) the pace of scientific progress in our research and development programs, (2) the magnitude of these programs, (3) the scope and results of preclinical testing and clinical trials, (4) the time and costs involved in obtaining regulatory approvals, (5) the costs involved in preparing, filing, prosecuting, maintaining and enforcing patent claims, (6) competing technological and market developments, (7) the ability to establish additional collaborations or changes in existing collaborations, (8) the cost of manufacturing scale-up and (9) the effectiveness of our commercialization activities.

YEAR 2000 COMPLIANCE

Many currently installed computer systems and software products are coded to accept only two digit entries in the date code field. These date code fields will need to accept four digit entries to distinguish 21st century dates from 20th century dates. As a result, many companies' software and computer systems may need to be upgraded or replaced in order to comply with year 2000 requirements. The impact of the year 2000 issue may affect other systems that utilize imbedded computer chip technology, including, building controls, security systems or laboratory equipment. It may also impact the ability to obtain products or services if the provider encounters and fails to resolve year 2000 related problems.

We have established an active program to identify and resolve year 2000 related issues. This program includes the review and assessment of our information technology and non-information technology systems, as well as third parties with whom we have a material relationship. This program consists of four phases: inventory, risk assessment, problem validation and problem resolution. The inventory phase identified potential risks we face. They include among others computer software, computer hardware, telecommunications systems, laboratory equipment, facilities systems (security, environment control, alarm), service providers (contract research organizations, consultants, product distribution), and other third parties. The risk assessment phase categorizes and prioritizes each risk by its potential impact. The problem validation phase tests each potential risk, according to priority, to determine if an action risk exists. In the case of critical third parties, this step will include a review of their year 2000 plans and activities. The problem resolution phase will, for each validated risk, determine the method/strategy for alleviating the risk. It may include anything from replacement of hardware or software to process modification to selection of alternative vendors. This step also includes the development of contingency plans.

We initiated this program in 1998. The inventory and risk assessment phases were completed in 1998 while the problem validation phase was completed in 1998 for all areas, except for evaluating specific pieces of research equipment and the assessment of some critical third parties. We expect that we will complete the last portion of the problem validation phase by the end of the second calendar quarter of 1999. Contingency plans are being developed. We expect to have those plans completed by the end of the second quarter of 1999. We expect the problem resolution phase to be completed by the end of the third quarter in 1999.

To date, we have determined that some of our internal information technology and non-information technology systems are not year 2000 compliant. However, we have not completed our full assessment of the critical third-party service providers we utilize. This assessment is taking place as part of the current problem validation phase.

We are actively correcting problems as we identify them. These corrections include the replacement of hardware and software systems, the identification of

alternative service providers and the creation of contingency plans. We currently estimate that the cost of identified problems will be approximately $100,000 for hardware and software upgrades or modifications. In addition, we estimate that we will incur approximately $400,000 of internal personnel costs to complete the remaining phases of the project. We do not believe that the cost of these actions will have a material adverse affect on our business. We expect that we will be able to resolve any problems we identify in the remaining phases of the project as part of normal operating expenses.

Any failure of our internal computer systems or of third-party equipment or software we use, or of systems maintained by our suppliers, to be year 2000 compliant may adversely effect our business. In addition, adverse changes in the purchasing patterns of our potential customers as a result of year 2000 issues affecting them may adversely effect our business. These expenditures by potential customers may result in reduced funds available to purchase our products, which could adversely effect our business.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

At December 31, 1998 our investment portfolio includes fixed-income securities of $40.3 million. These securities are subject to interest rate risk and will decline in value if interest rates increase. However, due to the short duration of our investment portfolio, an immediate 10% change in interest rates would have no material impact on our financial condition or results of operations.

We generally conduct business including sales to foreign customers, in U.S. dollars and as a result we have very limited foreign currency exchange rate risk. The effect of an immediate 10% change in foreign exchange rates would not have a material impact on our financial condition or results of operations.

ITEM 8. CONSOLIDATED FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The consolidated financial statements and supplementary data of the Company required by this item are set forth at the pages indicated in Item 14(a)(1).

ITEM 9. CHANGES AND DISAGREEMENTS WITH ACCOUNTANTS AND FINANCIAL DISCLOSURE

Not applicable.

PART III

ITEM 10. DIRECTORS AND EXECUTIVE OFFICERS OF THE REGISTRANT

The sections labeled "Election of Directors", "Executive Officers" and "Section 16(a) Beneficial Ownership Reporting Compliance" appearing in the Company's Proxy Statement to be delivered to stockholders in connection with the 1999 Annual Meeting of Stockholders are incorporated herein by reference (the "Proxy Statement.")

ITEM 11. EXECUTIVE COMPENSATION

The section labeled "Executive Compensation and Other Information" appearing in the Proxy Statement is incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The sections labeled "Principal Stockholders" and "Security Ownership of Directors and Management" appearing in the Proxy Statement are incorporated herein by reference.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS

The sections labeled "Executive Compensation and Other Information" and "Certain Relationships and Related Transactions" appearing in the Proxy Statement are incorporated herein by reference.

PART IV

ITEM 14. EXHIBITS, FINANCIAL STATEMENT SCHEDULES, AND REPORTS ON FORM 8-K

(a) (1) FINANCIAL STATEMENTS

The financial statements required by this item are submitted in a separate section beginning on Page F-1 of this report.

CONSOLIDATED FINANCIAL STATEMENTS OF LIGAND PHARMACEUTICALS INCORPORATED

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<S> <C>
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Consolidated Statements of Stockholders' Equity for each of the three years in the period ended December 31, 1998..... F-5
Consolidated Statements of Cash Flows for each of the three years in the period ended December 31, 1998..... F-6
Notes to Consolidated Financial Statements..... F-7
</TABLE>

(b) REPORTS ON FORM 8-K

There were no reports on Form 8-K filed by the Registrant during the fourth quarter of the fiscal year ended December 31, 1998.

(c) EXHIBITS

<TABLE>
<CAPTION>
EXHIBIT NUMBER	DESCRIPTION
<C> <S>	<C>
# 2.1	Agreement of Merger, dated February 7, 1995 by and among Ligand Pharmaceuticals Incorporated, LG Acquisition Corp. and Glycomed Incorporated (other Exhibits omitted, but will be filed by the Company with the Commission upon request).
# 2.2	Form of Plan of Merger.
### 2.3	Agreement and Plan of Reorganization dated May 11, 1998, by and among the Company, Knight Acquisition Corp. and Seragen, Inc. (Exhibit 2.1).
### 2.4	Form of Certificate of Seragen Merger. (Exhibit 2.2).
### 3.1	Amended and Restated Certificate of Incorporation of the Company. (Exhibit 3.2)
### 3.2	Bylaws of the Company, as amended. (Exhibit 3.3)
### 3.3	Certificate of Designation of Rights, Preferences and Privileges of Series A Participating Preferred Stock of the Company. (Exhibit 3.4).
# 10.1	The Company's 1992 Stock Option/Stock Issuance Plan, as amended.
* 10.2	Form of Stock Option Agreement.
* 10.3	Form of Stock Issuance Agreement.
* 10.7	The Company's 1988 Stock Option Plan, as amended.
* 10.8	Form of Incentive Stock Option Agreement (Installment Vesting).
* 10.9	Form of Non-Qualified Stock Option Agreement (Installment Vesting).
* 10.10	Form of Consultant Non-Qualified Stock Option Agreement (Immediate Vesting).
* 10.12	1992 Employee Stock Purchase Plan.
* 10.13	Form of Stock Purchase Agreement.
</TABLE>

<TABLE>
<CAPTION>
EXHIBIT NUMBER	DESCRIPTION
<C> <S>	<C>
* 10.29	Consulting Agreement, dated October 20, 1988, between the Company and Dr. Ronald M. Evans, as amended by Amendment to

Consulting Agreement, dated August 1, 1991, and Second Amendment to Consulting Agreement, dated March 6, 1992.

* 10.30 Form of Proprietary Information and Inventions Agreement. Research and License.

* 10.31 Agreement, dated March 9, 1992, between the Company and Baylor College of Medicine (with certain confidential portions omitted).

* 10.33 License Agreement, dated November 14, 1991, between the Company and Rockefeller University (with certain confidential portions omitted).

* 10.34 License Agreement and Bailment, dated July 22, 1991, between the Company and the Regents of the University of California (with certain confidential portions omitted).

* 10.35 Agreement, dated May 1, 1991, between the Company and Pfizer Inc (with certain confidential portions omitted).

* 10.36 License Agreement, dated July 3, 1990, between the Company and the Brigham and Woman's Hospital, Inc. (with certain confidential portions omitted).

* 10.37 Compound Evaluation Agreement, dated May 17, 1990, between the Company and SRI International (with certain confidential portions omitted).

* 10.38 License Agreement, dated January 5, 1990, between the Company and the University of North Carolina at Chapel Hill (with certain confidential portions omitted).

* 10.40 License Agreement, dated January 4, 1990, between the Company and Baylor College of Medicine (with certain confidential portions omitted).

* 10.41 License Agreement, dated October 1, 1989, between the Company and Institute Pasteur (with certain confidential portions omitted).

* 10.42 Sublicense Agreement, dated September 13, 1989, between the Company and AndroBio Corporation (with certain confidential portions omitted).

* 10.43 License Agreement, dated June 23, 1989, between the Company and La Jolla Cancer Research Foundation (with certain confidential portions omitted).

* 10.44 License Agreement, dated October 20, 1988, between the Company and the Institute for Biological Studies, as amended by Amendment to License Agreement dated September 15, 1989, Second Amendment to License Agreement, dated December 1, 1989 and Third Amendment to License Agreement dated October 20, 1990 (with certain confidential portions omitted).

* 10.45 Agreement dated June 12, 1989, between the Company and the Regents of the University of California.

* 10.46 Form of Indemnification Agreement between the Company and each of its directors.

* 10.47 Form of Indemnification Agreement between the Company and each of its officers.

* 10.50 Consulting Agreement, dated October 1, 1991, between the Company and Dr. Bert W. O'Malley.

* 10.53 Stock And Warrant Purchase Agreement, Dated June 30, 1992 Between The Company And Allergan, Inc. And Allergan Pharmaceuticals (Ireland) Ltd., Inc.

* 10.58 Stock Purchase Agreement, dated September 9, 1992, between the Company and Glaxo, Inc.

* 10.59 Research and Development Agreement, dated September 9, 1992, between the Company and Glaxo, Inc. (with certain confidential portions omitted).

</TABLE>

<TABLE>
<CAPTION>

EXHIBIT NUMBER	DESCRIPTION
<C> <S>	<C>
* 10.60	Stock Transfer Agreement, dated September 30, 1992, between the Company and the Rockefeller University.
* 10.61	Stock Transfer Agreement, dated September 30, 1992, between the Company and New York University.
* 10.62	License Agreement, dated September 30, 1992, between the

Company and the Rockefeller University (with certain confidential portions omitted).

* 10.63 Professional Services Agreement, dated September 30, 1992, between the Company and Dr. James E. Darnell.

* 10.64 Letter Agreement, dated August 24, 1992, between the Company and Dr. Howard T. Holden.

* 10.65 Letter Agreement, dated August 20, 1992, between the Company and Dr. George Gill.

* 10.67 Letter Agreement, dated September 11, 1992, between the Company and Mr. Paul Maier.

!! 10.69 Form of Automatic Grant Option Agreement.

** 10.73 Supplementary Agreement, dated October 1, 1993, between the Company and Pfizer, Inc. to Agreement, dated May 1, 1991.

! 10.76 Amended Registration Rights Agreement, dated June 24, 1994, between the Company and the individuals listed on attached Schedule A, as amended (Exhibit 4.1).

! 10.77 First Addendum to Amended Registration Rights Agreement, dated July 6, 1994, between Company and Abbott Laboratories. (Exhibit 4.2).

*** 10.78 Research, Development and License Agreement, dated July 6, 1994, between the Company and Abbott Laboratories (with certain confidential portions omitted). (Exhibit 10.75).

*** 10.79 Stock and Note Purchase Agreement, dated September 2, 1994, between the Company and American Home Products Corporation (with certain confidential portions omitted).

*** 10.80 Unsecured Convertible Promissory Note dated September 2, 1994, in the face amount of $10,000,000 executed by the Company in favor of American Home Products Corporation (with certain confidential portions omitted). (Exhibit 10.78).

*** 10.81 Second Addendum to Amended Registration Rights Agreement, dated September 2, 1994, between the Company and American Home Products Corporation.

*** 10.82 Research, Development and License Agreement, dated September 2, 1994, between the Company and American Home Products Corporation, as represented by its Wyeth-Ayerst Research Division (with certain confidential portions omitted). (Exhibit 10.77).

*** 10.83 Option Agreement, dated September 2, 1994, between the Company and American Home Products Corporation, as represented by its Wyeth-Ayerst Research Division (with certain confidential portions omitted). (Exhibit 10.80).

*** 10.84 Distribution and Marketing Agreement, dated September 16, 1994, between the Company and Cetus Oncology Corporation, a wholly owned subsidiary of the Chiron Corporation (with certain confidential portions omitted). (Exhibit 10.82).

& 10.93 Indemnity Agreement, dated June 3, 1995, between the Company, Allergan, Inc. and Allergan Ligand Retinoid Therapeutics, Inc.

& 10.94 Tax Allocation Agreement, dated June 3, 1995, between the Company, Allergan, Inc. and Allergan Ligand Retinoid Therapeutics, Inc.

& 10.95 Stock Purchase Agreement, dated June 3, 1995, between the Company, Allergan, Inc. and Allergan Pharmaceuticals (Ireland), Ltd.

</TABLE>

<TABLE>
<CAPTION>

EXHIBIT NUMBER	DESCRIPTION
<C> <S>	<C>
& 10.97	Research, Development and License Agreement, dated December 29, 1994, between SmithKline Beecham Corporation and the Company (with certain confidential portions omitted).
& 10.98	Stock and Note Purchase Agreement, dated February 2, 1995, between SmithKline Beecham Corporation, S.R. One Limited and the Company (with certain confidential portions omitted).
& 10.99	Third Addendum to Amended Registration Rights Agreement, dated February 3, 1995, between S. R. One, Limited and the Company.

10.100 PHOTOFRIN(R) Distribution Agreement, dated March 8, 1995, between the Company and Quadra Logic Technologies Inc. (with certain confidential portions omitted).

10.119(1) Option and Development Agreement, dated August 15, 1990, between Glycomed and Dr. Richard E. Galardy and Dr. Damian Grobelny with exhibit thereto (with certain portions omitted). (Exhibit 10.20).

10.120(1) Option and Development Agreement, dated November 27, 1989, between Glycomed and the President and Fellows of Harvard College with appendices thereto (with certain confidential portions omitted). (Exhibit 10.21)

10.121(1) Option and Development Agreement, dated January 1, 1991, between Glycomed and UAB Research Foundation with exhibits thereto (with certain confidential portions omitted). (Exhibit 10.22).

10.122(1) Joint Venture Agreement, dated December 18, 1990, among Glycomed, Glyko, Inc., Millipore Corporation, Astroscan, Ltd., Astromed, Ltd., Gwynn R. Williams and John Klock, M.D., with exhibits thereto (with certain confidential portions omitted). (Exhibit 10.23).

10.127(2) Research and License Agreement, dated April 29, 1992, between Glycomed and the Alberta Research Council with Appendix thereto (with certain confidential portions omitted). (Exhibit 10.28).

10.130(3) Amendment to Research and License Agreement, dated July 12, 1993, (confidential portions omitted). (Exhibit 10.32).

10.131(4) Amendments to Research and License Agreement, dated October 22, 1993, December 16, 19 and May 9, 1994 between Glycomed and the Alberta Research Council (with certain confidential portions omitted). (Exhibit 10.33).

10.132(4) License Agreement, dated February 14, 1994 between Glycomed and Sankyo Company, Ltd., for the Far East marketing rights of ophthalmic indications of Galardin(TM) MPI and analogs (with certain confidential portions omitted). (Exhibit 10.34).

10.133(4) Collaborative Technology Research and Development Agreement between Glycomed and Sankyo Company, Ltd., dated June 27, 1994 (with certain confidential portions omitted). (Exhibit 10.35).

10.136(5) Amendment to Research and License Agreement, dated September 22, 1994 between Glycomed and Alberta Research Council (with certain confidential portions omitted). (Exhibit 10.38).

10.137 First Supplemental Indenture among the Company, Glycomed and Chemical Trust Company of California, Trustee. (Exhibit 10.133).

%% 10.140 Promissory Notes, General Security Agreements and a Credit Terms and Conditions letter dated March 31, 1995, between the Company and Imperial Bank (Exhibit 10.101).

-- 10.142 Stock Purchase Agreement, dated June 27, 1995, between the Company and Sankyo Company, Ltd.

</TABLE>

<TABLE>
<CAPTION>

EXHIBIT NUMBER	DESCRIPTION
<C> <S>	<C>
-- 10.143	Fifth Addendum to Amended Registration Rights Agreement, dated September 11, 1995 between the Company and Sankyo Company Limited.
-- 10.144	Stock Purchase Agreement, dated August 28, 1995, between the Company and Abbott Laboratories.
-- 10.145	Sixth Addendum to Amended Registration Rights Agreement, dated August 31, 1995, between the Company and Abbott Laboratories.
-- 10.146	Amendment to Research and Development Agreement, dated January 16, 1996, between the Company and American Home Products Corporation, as amended.
-- 10.147	Amendment to Stock Purchase Agreement, dated January 16, 1996, between the Company and American Home Products

Corporation.

-- 10.148 Lease, dated July 6, 1994, between the Company and Chevron/Nexus partnership, First Amendment to lease dated July 6, 1994.

x 10.149 Successor Employment Agreement, signed May 1, 1996, between the Company and David E. Robinson.

10.150(6) Master Lease Agreement, signed May 30, 1996, between the Company and USL Capital Corporation.

x 10.151 Settlement Agreement and Mutual Release of all Claims, signed April 20, 1996, between the Company and Pfizer, Inc. (with certain confidential portions omitted).

x 10.152 Letter Amendment to Abbott Agreement, dated March 14, 1996, between the Company and Abbott Laboratories (with certain confidential portions omitted).

Xx 10.153 Letter Agreement, dated August 8, 1996, between the Company and Dr. Andres Negro-Vilar.

10.154 Preferred Shares Rights Agreement, dated as of September 13, 1996, by and between Ligand Pharmaceuticals Incorporated and Wells Fargo Bank, N.A. (Exhibit 10.1).

10.155(6) Letter Agreement, dated November 4, 1996, between the Company and William Pettit.

10.156(6) Letter Agreement, dated February 6, 1997, between the Company and Russell L. Allen.

10.157(6) Master Lease Agreement, signed February 13, 1997, between the Company and Lease Management Services.

10.158(6) Lease, dated March 7, 1997, between the Company and Nexus Equity VI LLC.

10.159(6) Eighth Addendum to amended registration rights agreement, dated June 24, 1994, as amended between Ligand Pharmaceuticals and S.R. One, Limited and is effective as of February 10, 1997.

10.160(6) Seventh Addendum to amended registration rights agreement, dated June 24, 1994, as amended between Ligand Pharmaceuticals and S.R. One, Limited and is effective as of November 10, 1995.

10.161(7) Settlement Agreement, License and Mutual General Release between Ligand Pharmaceuticals and SRI/LJCRF, dated August 23, 1995 (with certain confidential portions omitted).

10.162(8) Limited Extension of Collaborative Technology Research, Option and Development Agreement between Ligand Pharmaceuticals and Sankyo Company Limited, dated June 24, 1997.

10.163(8) Extension of Master Lease Agreement between Lease Management Services and Ligand Pharmaceuticals dated July 29, 1997.

10.164(9) Third Amendment to Agreement, dated September 2, 1997, between the Company and American Home Products Corporation.

</TABLE>

<TABLE>
<CAPTION>

EXHIBIT NUMBER	DESCRIPTION
<C> <S>	<C>
10.165(10)	Amended and Restated Technology Cross License Agreement, dated September 24, 1997, among the Company, Allergan, Inc. and Allergan Ligand Retinoid Therapeutics, Inc.
10.166(10)	Transition Agreement, dated September 24, 1997, among the Company, Allergan, Inc. and Allergan Ligand Retinoid Therapeutics, Inc.
10.167(10)	Development and License Agreement, dated November 25, 1997, between the Company and Eli Lilly and Company (with certain confidential portions omitted).
10.168(10)	Collaboration Agreement, dated November 25, 1997, among the Company, Eli Lilly and Company, and Allergan Ligand Retinoid Therapeutics, Inc. (with certain confidential portions omitted).
10.169(10)	Option and Wholesale Purchase Agreement, dated November 25, 1997, between the Company and Eli Lilly and Company (with certain confidential portions omitted).
10.170(10)	Stock Purchase Agreement, dated November 25, 1997, between

the Company and Eli Lilly and Company.

10.171(10) First Amendment to Option and Wholesale Purchase Agreement dated February 23, 1998, between the Company and Eli Lilly and Company (with certain confidential portions omitted).

10.172(10) Second Amendment to Option and Wholesale Purchase Agreement, dated March 16, 1998, between the Company and Eli Lilly and Company (with certain confidential portions omitted).

10.173(11) Ninth Addendum to Amended Registration Rights Agreement, dated June 24, 1994, between the Company and SmithKline Beecham plc., and is effective as of April 24, 1998.

10.174(11) Leptin Research, Development and License Agreement, dated March 17, 1998, between the Company and SmithKline Beecham, plc (with certain confidential portions omitted).

10.175(11) Stock and Warrant Purchase Agreement, dated March 17, 1998, among the Company, SmithKline Beecham, plc. and SmithKline Beecham Corporation (with certain confidential portions omitted).

10.176(12) Secured Promissory Note, dated March 7, 1997, in the face amount of $3,650,000, payable to the Company by Nexus Equity VI LLC. (Filed as Exhibit 10.1).

10.177(12) Amended memorandum of Lease effective March 7, 1997, between the Company and Nexus Equity VI LLC. (filed as exhibit 10.2)

10.178(12) First Amendment to Lease, dated March 7, 1997, between the Company and Nexus Equity VI LLC. (filed as exhibit 10.3)

10.179(12) First Amendment to secured Promissory Note, date March 7, 1997, payable to the Nexus Equity VI LLC. (filed as exhibit 10.4)

10.180(13) Form of Seragen Stockholder Voting Agreement. (Exhibit 10.1).

10.181(13) Form of Irrevocable Proxy to Vote Seragen, Inc. stock. (Exhibit 10.2).

10.182(14) Option and Asset Purchase Agreement, dated May 11, 1998, by and among the Company, Marathon Biopharmaceuticals, LLC, 520 Commonwealth Avenue Real Estate Corp. and 660 Corporation. (Exhibit 10.3).

10.183(15) Extension Option Agreement, dated May 11, 1998, by and among the Company, Seragen, Inc., Marathon Biopharmaceuticals, LLC, 520 Commonwealth Avenue Real Estate Corp. and 660 Corporation. (Exhibit 99.5)

</TABLE>

<TABLE>
<CAPTION>

EXHIBIT NUMBER	DESCRIPTION
<C> <S>	<C>
10.184(15)	Letter agreement, dated May 11, 1998, by and among the Company, Eli Lilly & Company and Seragen, Inc. (Exhibit 99.6).
### 10.185	Amendment No. 3 to Option and Wholesale Purchase Agreement, dated May 11, 1998, by and between Eli Lilly and Company and the Company. (Exhibit 10.6).
### 10.186	Agreement, dated May 11, 1998, by and among Eli Lilly and Company, the Company and Seragen, Inc. (Exhibit 10.7).
### 10.187	Form of Escrow Agreement to be entered into by and among Lehman Brothers Inc., Shoreline Pacific Institutional Finance, Seragen LLC, Reed R. Prior, Jean C. Nichols, Elizabeth C. Chen, Robert W. Crane, Leon C. Hirsch, Turi Josefsen, Gerald S.J. Cassidy and Loretta P. Cassidy, the Company, Knight Acquisition Corporation, Seragen, Inc. and State Street Bank and Trust Company. (Exhibit 10.8).
10.188(15)	Settlement Agreement, dated May 1, 1998, by and among Seragen, Inc., Seragen Biopharmaceuticals Ltd./Seragen Biopharmaceutique Ltee, Sofinov Societe Financiere D'Innovation Inc., Societe Innovatech Du Grand Montreal, MDS Health Ventures Inc., Canadian Medical Discoveries Fund Inc., Royal Bank Capital Corporation and Health Care and Biotechnology Venture Fund (Exhibit 99.2).
10.189(15)	Accord and Satisfaction Agreement, dated May 11, 1998, by and among Seragen, Inc., Seragen Technology, Inc., Trustees

of Boston University, Seragen LLC, Marathon Biopharmaceuticals, LLC, United States Surgical Corporation, Leon C. Hirsch, Turi Josefsen, Gerald S.J. and Loretta P. Cassidy, Reed R. Prior, Jean C. Nichols, Elizabeth C. Chen, Robert W. Crane, Shoreline Pacific Institutional Finance, Lehman Brothers Inc., 520 Commonwealth Avenue Real Estate Corp. and 660 Corporation (Exhibit 99.4).

10.190 Amendment No. 1 to Service Agreement, dated as of May 11, 1998, by and between Seragen, Inc. and Marathon Biopharmaceuticals, LLC. (Exhibit 10.11)

10.191(12) Letter of Agreement dated September 28, 1998 among the Company, Elan Corporation, plc and Elan International Services, Ltd. (with certain confidential portions omitted), (filed as exhibit 10.5)

10.192(12) Stock Purchase Agreement dated September 30, 1998 between the Company and Elan International Services, Ltd. (with certain confidential portions omitted), (filed as exhibit 10.6)

10.193(12) Tenth Addendum to Registration Rights Agreement dated September 30, 1998 between the Company and Elan International Services Ltd. (filed as exhibit 10.7)

10.194 Eleventh Addendum to Registration Rights Agreement dated November 9, 1998 between the Company and Elan International Services Ltd.

10.195 Zero Coupon Convertible Senior Note Due 2008 dated November 9, 1998 between the Company and Elan International Services Ltd., No. R-1.

10.196 Zero Coupon Convertible Senior Note Due 2008 dated November 9, 1998 between the Company and Elan International Services Ltd., No. R-2.

21.1 Subsidiaries of Registrant.

23.1 Consent of Ernst & Young LLP, Independent Auditors.

24.1 Power of Attorney (See Page 53).

27.1 Financial Data Schedule.

</TABLE>

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<TABLE>
<S> <C>

* These exhibits were previously filed as part of, and are hereby incorporated by reference to, the same numbered exhibit filed with the Company's Registration Statement on Form S-1 (No. 33-47257) filed on April 16, 1992 as amended.

</TABLE>

<TABLE>
<S> <C>

% These exhibits were previously filed as part of, and are hereby incorporated by reference to, the same numbered exhibit filed with the Company's Annual Report on Form 10-K for the year ended December 31, 1992.

** These exhibits were previously filed as part of, and are hereby incorporated by reference to, the same numbered exhibit filed with the Company's Annual Report on Form 10-K for the year ended December 31, 1993.

*** These exhibits were previously filed as part of, and are hereby incorporated by reference to, the same numbered exhibit (except as otherwise noted) filed with the Company's Quarterly Report on Form 10-Q for the period ended September 30, 1994.

! These exhibits were previously filed as part of, and are hereby incorporated by reference to, the exhibit filed with the Company's Form 8-K, filed on July 14, 1994.

!! This exhibit was previously filed as part of, and is hereby incorporated by reference to Exhibit 99.1 filed with the Company's Form S-8 (No. 33-85366), filed on October 17, 1994.

& These exhibits were previously filed as part of, and are hereby incorporated by reference to, the same numbered exhibit filed with the Registration Statement on Form S-1/S-3 (No. 33-87598 and 33-87600) filed on December 20,

1994, as amended.

These exhibits were previously filed as part of, and are hereby incorporated by reference to the numbered exhibit filed with the Registration Statement on Form S-4 (No. 33-90160) filed on March 9, 1995, as amended.

%% This exhibit was previously filed as part of, and are hereby incorporated by reference to the same numbered exhibit filed with the Company's Quarterly report on Form 10-Q for the period ended September 30, 1995.

- -- These exhibits were filed previously, and are hereby incorporated by reference to the same numbered exhibit filed with the Company's Annual Report on Form 10-K for the year ended December 31, 1995.

x These exhibits were previously filed as part of, and are hereby incorporated by reference to the same numbered exhibit filed with the Company's Quarterly report on Form 10-Q for the period ended June 30, 1996.

Xx This exhibit was previously filed as part of, and are hereby incorporated by reference at the same numbered exhibit filed with the Company's Quarterly report on Form 10-Q for the period ended September 30, 1996.

These exhibits were previously filed as part of, and are hereby incorporated by reference, the same numbered exhibit filed with the Company's Registration Statement on Form S-3 (No. 333-12603) filed on September 25, 1996, as amended.

These exhibits were previously filed as part of, and are hereby incorporated by reference to the same numbered exhibit filed with the Company's Registration Statement on Form S-4 (No. 333-58823) filed on July 9, 1998.

(1) Filed as an exhibit to Glycomed's Registration Statement on Form S-1 (No. 33-39961) filed on or amendments thereto and incorporated herein by reference.

(2) Filed as an exhibit to Glycomed's Annual Report on Form 10-K (File No. 0-19161) filed on September 25, 1992 and incorporated herein by reference.

(3) Filed as an exhibit to Glycomed's Annual Report on Form 10-K (File No. 0-19161) filed on September 13, 1993 and incorporated herein by reference.

(4) Filed as an amendment to Glycomed's Annual Report on Form 10-K (File No. 0-19161) filed on September 27, 1994 and incorporated herein by reference.

(5) Filed as an exhibit to Glycomed's Quarterly Report on Form 10-Q (File No. 0-19161) filed on February 10, 1995 and incorporated herein by reference.

</TABLE>

<TABLE>
<S> <C>

(6) This exhibit was previously filed as part of, and is hereby incorporated by reference to the same numbered exhibit filed with the Company's Annual Report on Form 10-K for the period ended December 31, 1996.

(7) This exhibit was previously filed as part of, and is hereby incorporated by reference to the same numbered exhibit filed with the Company's Quarterly Report on Form 10-Q for the period ended March 31, 1997.

(8) This exhibit was previously filed as part of, and is hereby incorporated by reference to the same numbered exhibit filed with the Company's Quarterly Report on Form 10-Q for the period ended June 30, 1997.

(9) This exhibit was previously filed as part of, and is hereby incorporated by reference to the same numbered exhibit filed with the Company's Quarterly Report on Form 10-Q for the period ended September 30, 1997.

(10) This exhibit was previously filed as part of and is hereby incorporated by reference to the same numbered exhibit filed with the Company's Annual Report on Form 10-K for the period ended December 31, 1997.

(11) These exhibits were previously filed as part of, and is hereby incorporated by reference to the same numbered exhibit filed with the Company's Quarterly Report on Form 10-Q for the period ended March 31, 1998.

(12) These exhibits were previously filed as part of and is hereby incorporated by reference to the numbered exhibit filed with the Company's Quarterly Report on Form 10-Q for the period ended September 30, 1998.
(13) Previously filed as, and hereby incorporated by reference to, Exhibit A filed with the Schedule 13D of the Company filed with the Commission on May 21, 1998 for Seragen, Inc.
(14) The schedules referenced in this agreement have not been included because they are either disclosed in such agreement or do not contain information which is material to an investment decision. The Company agrees to furnish a copy of such schedules to the Commission upon request.
(15) Previously filed as, and hereby incorporated by reference to, the same-numbered exhibit filed with the Current Report on Form 8-K of Seragen, Inc. filed with the Commission on May 15, 1998 (except as otherwise noted).
</TABLE>

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

LIGAND PHARMACEUTICALS INCORPORATED

By: /s/ DAVID E. ROBINSON

David E. Robinson,
President and Chief Executive Officer

Date: March 31, 1999

POWER OF ATTORNEY

Know all men by these presents, that each person whose signature appears below constitutes and appoints David E. Robinson or Paul V. Maier, his or her attorney-in-fact, with power of substitution in any and all capacities, to sign any amendments to this Annual Report on Form 10-K, and to file the same with exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that the attorney-in-fact or his or her substitute or substitutes may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

<TABLE>
<CAPTION>

SIGNATURE	TITLE	DATE
<S>	<C>	<C>
/s/ DAVID E. ROBINSON - ---------- David E. Robinson	Chairman of the Board, President, Chief Executive Officer and Director (Principal Executive Officer)	March 26, 1999
/s/ PAUL V. MAIER - ---------- Paul V. Maier	Senior Vice President, Chief Financial Officer (Principal Financial and Accounting Officer)	March 24, 1999
/s/ HENRY F. BLISSENBACH - ---------- Henry F. Blissenbach	Director	March 24, 1999
/s/ ALEXANDER D. CROSS	Director	March 23, 1999

Alexander D. Cross		
/s/ JOHN GROOM John Groom	Director	March 24, 1999
/s/ IRVING S. JOHNSON Irving S. Johnson	Director	March 23, 1999
/s/ CARL C. PECK Carl C. Peck	Director	March 23, 1999
/s/ VICTORIA R. FASH Victoria R. Fash	Director	March 30, 1999

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Consolidated Statements of Cash Flows.....	F-6
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REPORT OF ERNST & YOUNG LLP, INDEPENDENT AUDITORS

The Board of Directors and Stockholders
Ligand Pharmaceuticals Incorporated

We have audited the accompanying consolidated balance sheets of Ligand Pharmaceuticals Incorporated as of December 31, 1998 and 1997, and the related consolidated statements of operations, stockholders' equity (deficit), and cash flows for each of the three years in the period ended December 31, 1998. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the consolidated financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Ligand Pharmaceuticals Incorporated at December 31, 1998 and 1997, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 1998, in conformity with generally accepted accounting principles.

ERNST & YOUNG LLP

San Diego, California
February 5, 1999

LIGAND PHARMACEUTICALS INCORPORATED

CONSOLIDATED BALANCE SHEETS
(IN THOUSANDS, EXCEPT SHARE DATA)

ASSETS

<TABLE>
<CAPTION>

	DECEMBER 31,	
	1998	1997
<S>	<C>	<C>
Current assets:		
Cash and cash equivalents	$ 32,801	$ 62,252
Short-term investments	37,166	20,978
Inventories	6,166	--
Other current assets	1,860	864
Total current assets	77,993	84,094
Restricted short-term investments	2,554	3,057
Property and equipment, net	23,722	14,853
Acquired technology	40,312	--
Notes receivable from officers and employees	544	559
Other assets	10,895	4,860
	$156,020	$107,423
LIABILITIES AND STOCKHOLDERS' EQUITY (DEFICIT)		
Current liabilities:		
Accounts payable	$ 12,363	$ 10,717
Accrued liabilities	7,216	5,609
Deferred revenue	4,115	2,616
Current portion of obligations under capital leases	3,201	2,753
Total current liabilities	26,895	21,695
Long-term obligations under capital leases	8,165	8,501
Convertible subordinated debentures	39,302	36,628
Accrued acquisition obligation	50,000	--
Convertible note	2,500	6,250
Zero coupon convertible senior notes	40,520	--
Commitments		
Stockholders' equity (deficit):		
Convertible preferred stock, $0.001 par value, 5,000,000 shares authorized; none issued	--	--
Common stock, $0.001 par value; 80,000,000 shares authorized, 45,690,067 shares and 38,504,459 shares issued at December 31, 1998 and 1997, respectively	46	39
Paid-in capital	384,715	311,681
Adjustment for unrealized gains (losses) on available-for-sale securities	(482)	384
Accumulated deficit	(395,630)	(277,744)
	(11,351)	34,360
Less treasury stock, at cost (1,114 shares in 1998 and 1997)	(11)	(11)
Total stockholders' equity (deficit)	(11,362)	34,349
	$156,020	$107,423

</TABLE>

See accompanying notes.

LIGAND PHARMACEUTICALS INCORPORATED

CONSOLIDATED STATEMENTS OF OPERATIONS
(IN THOUSANDS, EXCEPT NET LOSS PER SHARE DATA)

<TABLE>
<CAPTION>

	YEARS ENDED DECEMBER 31,		
	1998	1997	1996
<S>	<C>	<C>	<C>
Revenues:			
Collaborative research and development:			
Related parties	$ --	$ 18,997	$ 18,641
Unrelated parties	17,267	32,284	17,994
Other	406	418	207
	17,673	51,699	36,842
Costs and expenses:			
Research and development	70,739	72,426	59,494
Selling, general and administrative	16,568	10,108	10,205
Write-off of acquired in-process technology	45,000	64,970	--
Total operating expenses	132,307	147,504	69,699
Loss from operations	(114,634)	(95,805)	(32,857)
Interest income	3,070	3,743	3,704
Interest expense	(8,322)	(8,088)	(8,160)
Realized gain on sale of investments	2,000	--	--
Net loss	$ (117,886)	$ (100,150)	$ (37,313)
Basic and diluted net loss per share	$ (2.92)	$ (3.02)	$ (1.30)
Shares used in computing net loss per share	40,392,421	33,128,372	28,780,914

</TABLE>

See accompanying notes.

LIGAND PHARMACEUTICALS INCORPORATED

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (DEFICIT)
FOR THE THREE YEARS ENDED DECEMBER 31, 1998
(IN THOUSANDS, EXCEPT PER SHARE DATA)

<TABLE>
<CAPTION>

	COMMON STOCK		PAID-IN CAPITAL	WARRANT SUBSCRIPTION RECEIVABLE	ADJUSTMENT FOR UNREALIZED GAINS (LOSSES) ON AVAILABLE-FOR-SALE SECURITIES	ACCUMULATED DEFICIT	DEFERRED COMPENSATION AND CONSULTING
	SHARES	AMOUNT					
<S>	<C>	<C>	<C>	<C>	<C>	<C>	<C>
Balance at December 31, 1995	27,800,597	$28	$173,452	$(4,524)	$ 217	$(140,281)	$(819)
Issuance of Common Stock	3,999,020	4	41,082	--	--	--	--
Amortization of deferred compensation and consulting fees	--	--	--	--	--	--	497
Adjustment for unrealized gains (losses) on available-for-sale securities	--	--	--	--	(295)	--	--
Receipt of Common Stock for milestone revenue	--	--	--	--	--	--	--
Retirement of shares	--	--	--	--	--	--	--
Purchase of treasury shares	--	--	--	--	--	--	--
Issuance of Common Stock held in Treasury	--	--	--	--	--	--	--
Option term extension	--	--	353	--	--	--	--
Amortization of warrant subscription receivable	--	--	--	2,071	--	--	--
Net loss	--	--	--	--	--	(37,313)	--
</TABLE>

Balance at December 31, 1996...	31,799,617	32	214,887	(2,453)	(78)	(177,594)	(322)	
Issuance of Common Stock.....	6,704,842	7	96,794	--	--	--	--	
Amortization of deferred compensation and consulting fees.....	--	--	--	--	--	--	322	
Amortization of warrant subscription receivable....	--	--	--	1,535	--	--	--	
Write-off of warrant subscription receivable....	--	--	--	918	--	--	--	
Adjustment of unrealized gains (losses) on available-for-sale securities.....	--	--	--	--	462	--	--	
Net loss.....	--	--	--	--	--	(100,150)	--	
Balance at December 31, 1997...	38,504,459	39	311,681	--	384	(277,744)	--	
Issuance of Common Stock.....	7,185,608	7	73,034	--	--	--	--	
Adjustment of unrealized gains (losses) on available for-sale securities.....	--	--	--	--	(866)	--	--	
Net loss.....	--	--	--	--	--	(117,886)	--	
Balance at December 31, 1998...	45,690,067	$46	$384,715	$ --	$(482)	$(395,630)	$ --	

<CAPTION>

	TREASURY STOCK		TOTAL STOCKHOLDERS' EQUITY	COMPREHENSIVE
	SHARES	AMOUNT	(DEFICIT)	INCOME
<S>	<C>	<C>	<C>	<C>
Balance at December 31, 1995...	(4,986)	$ (2)	28,071	$ --
Issuance of Common Stock.....	--	--	41,086	
Amortization of deferred compensation and consulting fees.....	--	--	497	
Adjustment for unrealized gains (losses) on available-for-sale securities.....	--	--	(295)	(295)
Receipt of Common Stock for milestone revenue.....	(101,011)	(1,320)	(1,320)	
Retirement of shares.....	101,011	1,320	1,320	
Purchase of treasury shares.....	(3,164)	(23)	(23)	
Issuance of Common Stock held in Treasury.....	7,036	14	14	
Option term extension.....	--	--	353	
Amortization of warrant subscription receivable....	--	--	2,071	
Net loss.....	--	--	(37,313)	(37,313)
Balance at December 31, 1996...	(1,114)	(11)	34,461	$ (37,608)
Issuance of Common Stock.....	--	--	96,801	
Amortization of deferred compensation and consulting fees.....	--	--	322	
Amortization of warrant subscription receivable....	--	--	1,535	
Write-off of warrant subscription receivable....	--	--	918	
Adjustment of unrealized gains (losses) on available-for-sale securities.....	--	--	462	462
Net loss.....	--	--	(100,150)	(100,150)
Balance at December 31, 1997...	(1,114)	(11)	34,349	$ (99,688)
Issuance of Common Stock.....	--	--	73,041	

Adjustment of unrealized gains (losses) on available for-sale securities.....	--	--	(866)	(866)
Net loss.....	--	--	(117,886)	(117,886)
Balance at December 31, 1998...	(1,114)	$ (11)	$ (11,362)	$(118,752)

</TABLE>

See accompanying notes.

LIGAND PHARMACEUTICALS INCORPORATED

CONSOLIDATED STATEMENTS OF CASH FLOWS
(IN THOUSANDS)

<TABLE>
<CAPTION>

	YEARS ENDED DECEMBER 31,		
	1998	1997	1996
<S>	<C>	<C>	<C>
OPERATING ACTIVITIES			
Net loss.....	$(117,886)	$(100,150)	$(37,313)
Adjustments to reconcile net loss to net cash used by operating activities:			
Depreciation and amortization.....	4,326	4,133	3,879
Amortization of notes receivable from officers and employees.....	188	230	235
Amortization of warrant subscription receivable.....	--	2,453	2,071
Write-off of acquired in-process technology.....	45,000	64,970	--
Amortization of deferred compensation and consulting....	--	322	497
Accretion of debt discount and interest on zero coupon convertible senior note.....	3,194	2,675	2,674
Company stock received for milestone revenue.....	--	--	(1,320)
Gain (loss) on sale of property and equipment.....	69	(6)	--
Change in operating assets and liabilities, net			
Other current assets.....	(1,031)	856	(1,129)
Receivable from a related party.....	--	3,087	(801)
Inventory.....	(2,899)	--	--
Accounts payable and accrued liabilities.....	891	7,605	(1,638)
Deferred revenue.....	1,499	465	(457)
Net cash used in operating activities.....	(66,649)	(13,360)	(33,302)
INVESTING ACTIVITIES			
Purchases of short-term investments.....	(52,245)	(35,033)	(53,123)
Proceeds from short-term investments.....	35,191	60,339	61,188
Purchase of property and equipment.....	(2,362)	(4,278)	(399)
Proceeds from sale of property and equipment.....	92	109	--
Increase in note receivable from officers and employees.....	(180)	(270)	(350)
Payment of notes receivable from officers and employees.....	8	16	66
Increases in other assets.....	(4,282)	(4,036)	(2)
Decreases in other assets.....	917	130	118
Net cash paid for exercise of ALRT stock purchase option....	--	(12,661)	--
Net cash paid for Seragen acquisition.....	(5,756)	--	--
Net cash (used in) provided by investing activities.....	(28,617)	4,316	7,498
FINANCING ACTIVITIES			
Principal payments on obligations under capital leases.....	(2,983)	(3,210)	(2,561)
Net change in restricted short-term investment.....	503	470	3,232
Net proceeds from the issuance of convertible note.....	--	2,500	5,000
Net proceeds from issuance of zero coupon convertible senior note.....	30,000	--	--
Net proceeds from sale of common stock.....	38,295	36,706	39,000
Net cash provided by financing activities.....	65,815	36,466	44,671
Net (decrease) increase in cash and cash equivalents.....	(29,451)	27,422	18,867
Cash and cash equivalents at beginning of period.....	62,252	34,830	15,963

Cash and cash equivalents at end of period.....	$ 32,801	$ 62,252	$ 34,830
SUPPLEMENTAL DISCLOSURE OF CASH FLOW INFORMATION:			
Interest paid.....	$ 5,736	$ 5,444	$ 5,559
SUPPLEMENTAL SCHEDULE OF NON-CASH INVESTING AND FINANCING ACTIVITIES:			
Additions to obligations under capital leases.....	$ 3,095	$ 3,146	$ 2,888
Issuance of common stock to purchase Seragen.....	25,996	--	--
Conversion of convertible note to common stock.....	3,750	7,500	3,750
Issuance of common stock for technology license.....	5,000	--	--
Issuance of zero coupon convertible senior note for technology license.....	10,000	--	--
Retirement of treasury stock.....	$ --	$ --	$ 1,320

</TABLE>

See accompanying notes.

LIGAND PHARMACEUTICALS INCORPORATED

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 1998

1. THE COMPANY

Ligand Pharmaceuticals Incorporated, a Delaware corporation (the "Company" or "Ligand"), is a biopharmaceutical company primarily committed to the discovery and development of new drugs that regulate hormone activated intracellular receptors and Signal Transducers and Activators of Transcription. The Company includes its wholly owned subsidiaries, Glycomed Incorporated ("Glycomed"), Ligand Pharmaceuticals (Canada) Incorporated, Allergan Ligand Retinoid Therapeutics, Inc. ("ALRT") and Seragen, Inc. ("Seragen").

In February 1999, the Company was granted U.S. Food and Drug Administration ("FDA") marketing approval for its first two products, Panretin(R) gel ("Panretin") for the treatment of Kaposi's sarcoma in AIDS Patients and ONTAK(TM) ("ONTAK") for treatment of patients with persistent or recurrent cutaneous T-cell lymphoma ("CTCL").

The Company's other potential products are in various stages of development. Potential products that appear to be promising at early stages of development may not reach the market for a number of reasons. Substantially all of the Company's revenues to date have been derived from its research and development agreements with major pharmaceutical collaborators. Prior to generating product revenues from these products, the Company must complete the development of its products in the human health care market. No assurance can be given that: (1) product development efforts will be successful (2) required regulatory approvals for any indication will be obtained (3) any products, if introduced will be capable of being produced in commercial quantities at reasonable costs or that (4) patient and physician acceptance of these products will be achieved. There can be no assurance that Ligand will ever achieve or sustain profitability.

The Company faces risks common to companies whose products are in various stages of development. These risks include, among others, the Company's need for additional financing to complete its research and development programs and commercialize its technologies. The Company expects to incur substantial additional research and development expenses, including continued increases in personnel and costs related to preclinical testing, clinical trials, and sales and marketing expenses related to product sales. The Company intends to seek additional funding sources of capital and liquidity through collaborative arrangements, collaborative research or through public or private financing. There is no assurance such financing would be available under favorable terms, if at all.

The Company believes that patents and other proprietary rights are important to its business. The Company's policy is to file patent applications to protect technology, inventions and improvements to its inventions that are considered important to the development of its business. The patent positions of pharmaceutical and biotechnology firms, including the Company, are uncertain and involve complex legal and technical questions for which important legal principles are largely unresolved.

2. SIGNIFICANT ACCOUNTING POLICIES

Principles of Consolidation

The consolidated financial statements include the accounts of the Company and its wholly owned subsidiaries. All significant intercompany accounts and transactions have been eliminated in consolidation.

Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the amounts reported in the financial statements and disclosures made in the accompanying notes to the consolidated financial statements. Actual results could differ from those estimates.

Cash, Cash Equivalents and Short-term Investments

Cash and cash equivalents consist primarily of cash, certificates of deposit, treasury securities and repurchase agreements with original maturities at the date of acquisition of less than three months.

The Company invests its excess cash principally in United States government debt securities, investment grade corporate debt securities and certificates of deposit. The Company has established guidelines relative to diversification and maturities that maintain safety and liquidity. These guidelines are periodically reviewed and modified to take advantage of trends in yields and interest rates.

Loss Per Share

Net loss per share is computed using the weighted average number of common shares outstanding.

Accounting for Stock-Based Compensation

The Company accounts for stock-based compensation in accordance with Accounting Principles Board Opinion No. 25, Accounting for Stock Issued to Employees. In January 1996, the Company adopted the disclosure requirements of SFAS 123, Accounting for Stock-Based Compensation (Note 9).

New Accounting Standards

As of January 1, 1998, the Company adopted SFAS 130, Reporting Comprehensive Income. SFAS 130 establishes new rules for the reporting and display of comprehensive income and its components; however, the adoption of this statement has no impact on the Company's net income or shareholders' equity. SFAS 130 requires unrealized gains or losses on the Company's available-for-sale securities and the foreign currency translation adjustments, which prior to adoption were reported separately in shareholders' equity, to be included in other comprehensive income. Prior year financial statements have been reclassified to conform to the requirements of SFAS 130.

As of January 1, 1998, the Company adopted SFAS 131, Segment Information. SFAS 131 amends the requirements for public enterprises to report financial and descriptive information about its reportable operating segments. The Company currently operates in one business and operating segment and the adoption of this standard did not have a material impact on the Company's financial statements as reported.

Research and Development Revenues and Expenses

Collaborative research and development revenues are recorded as earned based on the performance criteria of each contract. Payments received which have not met the appropriate criteria are recorded as deferred revenue. Research and development costs are expensed as incurred.

For the years ended December 31, 1998, 1997 and 1996, costs and expenses related to collaborative research and development agreements were $17.3 million, $51.3 million, $36.6 million, respectively.

Inventories

Inventories are stated at the lower of cost or market. Cost is determined using the first-in-first-out method.

<TABLE>
<S> <C>
Raw materials..... $2,382
Work-in-process..... 3,634
Finished goods..... 150

$6,166
=======
</TABLE>

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
DECEMBER 31, 1998

The products Panretin(R) and ONTAK(TM) received approval for marketing by the FDA in early February 1999. The Company outsources all manufacturing related to the production of commercial inventory. Inventory also includes Targretin(R) ("Targretin") for which a New Drug Application ("NDA") will be filed in 1999. In preparation for the approval by the FDA, if received, Ligand has manufactured commercial quantities of Targretin of approximately $1.3 million of work-in-process inventory as of December 31, 1998. If the FDA does not approve the NDA, and Targretin is not approved for commercial sale, any capitalized costs related to Targretin will be expensed.

Property and Equipment

Property and equipment is stated at cost and consists of the following (in thousands):

<TABLE>
<CAPTION>
DECEMBER 31,

1998 1997

<S> <C> <C>
Property..... $ 2,649 $ 2,649
Equipment and leasehold improvements..... 38,854 26,662
Less accumulated depreciation and amortization..... (17,781) (14,458)

Net property and equipment..... $ 23,722 $ 14,853
=========
</TABLE>

Depreciation of equipment and leasehold improvements is computed using the straight-line method over the estimated useful lives of the assets which range from three to fifteen years. Assets acquired pursuant to capital lease arrangements and leasehold improvements are amortized over their estimated useful lives or their related lease term, whichever is shorter.

3. INVESTMENTS

Investments are recorded at estimated fair market value at December 31, 1998 and 1997, and consist principally of United States government debt securities, investment grade corporate debt securities and certificates of deposit with maturities at the date of acquisition of three months or longer. The Company has

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

classified all of its investments as available-for-sale securities. The following table summarizes the various investment categories at (in thousands):

<TABLE>
<CAPTION>

	COST	GROSS UNREALIZED GAINS (LOSSES)	ESTIMATED FAIR VALUE
<S>	<C>	<C>	<C>
DECEMBER 31, 1998			
Available-for-Sale:			
U.S. Government Securities	$13,240	$ 5	$13,245
Corporate Obligations	19,262	63	19,325
Certificates of Deposit	4,596	--	4,596
	37,098	68	37,166
Certificates of Deposit-restricted	2,554	--	2,554
Equity securities	693	(550)	143
	$40,345	$(482)	$39,863
DECEMBER 31, 1997			
Available-for-Sale:			
U.S. Government Securities	$11,790	$ 9	$11,799
Corporate Obligations	7,085	2	7,087
Certificates of Deposit	2,093	(1)	2,092
	20,968	10	20,978
Certificates of Deposit-restricted	3,057	--	3,057
Equity securities	440	374	814
	$24,465	$ 384	$24,849

</TABLE>

Equity securities are included in long-term other assets.

The realized gains on sales of available-for-sale securities for the year ended December 31, 1998 is $2.0 million. There were no material realized gains or losses for the year ended December 31, 1997.

The amortized cost and estimated fair value of debt and marketable securities at December 31, 1998 and 1997, by contractual maturity, are shown below (in thousands). Expected maturities will differ from contractual maturities because the issuers of the securities may have the right to prepay obligations without prepayment penalties.

<TABLE>
<CAPTION>

	DECEMBER 31, 1998		DECEMBER 31, 1997	
	COST	ESTIMATED FAIR VALUE	COST	ESTIMATED FAIR VALUE
<S>	<C>	<C>	<C>	<C>
Due in one year or less	$24,270	$24,291	$17,148	$17,151
Due after one year through three years	15,382	15,429	6,782	6,792
Due after three years	--	--	94	92
	39,652	39,720	24,025	24,035
Equity securities	693	143	440	814
	$40,345	$39,863	$24,465	$24,849

</TABLE>

4. MERGER WITH SERAGEN

In August 1998, the Company completed a merger with Seragen (the "Merger"). In addition, the Company had previously announced that it had signed a definitive asset purchase agreement to acquire substantially all the assets of

Marathon Biopharmaceuticals, LLC, ("Marathon") which currently provides

manufacturing services to Seragen under a service agreement. Finally, in August 1998 Seragen signed an agreement with the Company and Eli Lilly and Company ("Lilly") under which Lilly assigned to the Company Lilly's rights and obligations under its agreements with Seragen, including its sales and marketing rights to ONTAK(TM).

Under the terms of the merger agreement, Ligand paid merger consideration at closing in the amount of $30.0 million, $4.0 million of which was in cash and $26.0 million of which was in the form of approximately 1,858,515 shares of the Company's Common Stock valued at $13.99 per share. The valuation of the Company's Common Stock for this portion of the transaction is based on the average closing share price for the five trading days prior to signing of the definitive agreement in May 1998.

The merger agreement also calls for an additional $37.0 million payment in cash and/or the Company's Common Stock, at the Company's option, to be paid six months after the date of receipt of final FDA clearance to market ONTAK. The final FDA clearance occurred in February 1999.

Additionally, the Company's agreement with Lilly calls for up to $5.0 million, payable in cash or the Company's Common Stock, at the Company's option, in potential milestone payments to Lilly, upon ONTAK approval by the FDA. Upon certain other events, Lilly could receive an additional $5.0 million in milestone payments.

On January 30, 1999, the Company purchased substantially all of the assets of Marathon for $5.0 million, through the issuance of 402,820 shares of the Company's Common Stock, at $12.41 per share, with an additional $3.0 million to be paid in August 1999, six months after the FDA approval of ONTAK.

The Merger was accounted for using the purchase method of accounting. The purchase price, totaling $84.1 million, which includes liabilities assumed of $2.3 million was allocated to the fair value of the assets acquired.

The purchase price is composed of and allocated to the fair value of assets acquired as follows (in thousands):

<TABLE>
<S> <C>

Issuance of common stock (including transaction costs).....	$25,996
Amounts due to Seragen shareholders, Marathon and Lilly, payable in common stock or cash.....	50,000
Liabilities assumed.....	2,360
Net cash paid.....	5,756
	$84,112
Inventory.....	$ 3,230
Property and equipment.....	7,905
Identifiable intangible assets:	
In-process technology.....	30,000
Acquired technology.....	40,312
Other intangibles.....	2,665
	$84,112

</TABLE>

The following pro forma condensed statement of operations information has been prepared to give effect to the merger as if such transaction had occurred at the beginning of the periods presented. The historical results of operations have been adjusted to reflect (1) adjustment for depreciation resulting from adjusting the basis of certain property and equipment to fair value and amortization over 10 years, (2) amortization of acquired technology over 15 years, (3) elimination of Seragen stock issuance costs (1997) and compensation

expense amortization (1998), (4) elimination of interest income for Seragen and reduction of Ligand interest

income resulting from use of $6.0 million for the Merger at an annual interest rate of 5.5%, and (5) elimination of interest expense related to certain Seragen liabilities. The information presented is not necessarily indicative of the results of future operations of the merged companies.

Included in the 1998 net loss is a one-time charge of $30.0 million related to in-process research and development included in the intangibles acquired.

PRO FORMA RESULTS OF OPERATIONS (UNAUDITED)
(IN THOUSANDS)

<TABLE>
<CAPTION>

	YEARS ENDED DECEMBER 31,	
	1998	1997
<S>	<C>	<C>
Revenues	$ 20,477	$ 56,413
Net loss	(124,867)	$(118,675)
Weighted average shares outstanding	40,392	34,987
Loss per share	(3.09)	(3.39)

</TABLE>

5. OTHER ASSETS AND ACCRUED LIABILITIES

Other assets are comprised of the following (in thousands):

<TABLE>
<CAPTION>

	DECEMBER 31,	
	1998	1997
<S>	<C>	<C>
Deferred rent	$ 3,429	$3,676
Prepaid royalty buyout	4,080	--
Intangible assets acquired	2,665	--
Investment in equity securities	143	814
Other	578	370
	$10,895	$4,860

</TABLE>

Accrued liabilities are comprised of the following (in thousands):

<TABLE>
<CAPTION>

	DECEMBER 31,	
	1998	1997
<S>	<C>	<C>
Accrued legal	$1,140	$ 451
Accrued interest	1,972	2,088
Accrued compensation	1,784	1,446
Other	2,320	1,624
	$7,216	$5,609

</TABLE>

6. CONVERTIBLE SUBORDINATED DEBENTURES

In May 1995, Glycomed Incorporated ("Glycomed") was merged into a wholly-owned subsidiary of the Company (the "Glycomed Merger"). In conjunction with the Glycomed Merger, the Company adjusted the carrying value of the Glycomed 7 1/2% Convertible Subordinated Debentures due 2003 (the "Debentures") issued by Glycomed in 1992 in the original amount of $50 million to $29.6 million, which was their fair market value at the date of the Glycomed Merger. The current carrying value approximates fair market value. The Company has entered into a supplemental indenture which provides for conversion of the Debentures into the Company's Common Stock at $26.52 per share. Debentures pay interest semi-annually at 7.5% per annum and are due in 2003. The difference between the face value and the fair market value at the acquisition date

will be accreted up to the face value over the remaining term of the Debentures and the accretion is charged to interest expense.

7. STRATEGIC ALLIANCE AND FINANCING

On September 1998, the Company and Elan Corporation, plc ("Elan") signed a binding letter of agreement. Elan purchased approximately $20.0 million of the Company's Common Stock in two installments. In September 1998, Elan purchased 1,278,970 shares of the Company's Common Stock for $14.9 million ($11.65 per share). The second installment to purchase 437,768 shares for $5.1 million ($11.65 per share) occurred at the closing of the transaction on November 9, 1998.

Elan purchased from the Company at the closing, $40.0 million in issue price of Zero Coupon Convertible Senior Notes, due 2008 with an 8.0% per annum yield to maturity (the "Notes"). Of these Notes, $30.0 million are convertible into the Company's Common Stock at $14.00 per share. The balance issued of $10.0 million along with up to an additional $70.0 million of Notes which Elan may also purchase will be convertible into the Company's Common Stock at a price which is the average of the closing prices of the Company's Common Stock for the 20 trading days immediately prior to the issuance of a Note plus a premium; however, in no event will the conversion price be less than $14.00 per share or more than $20.00 per share. Interest will accrue during the term of the Notes, and the Notes may be used to finance the final payments for the Seragen merger expected in 1999 as well as other acquisitions of complementary technologies, subject to the consent of Elan.

Elan also agreed to exclusively license to the Company in the United States and Canada its proprietary product Morphelan(TM). For the rights to Morphelan(TM) the Company will pay Elan certain license fees at the closing of the transaction, and milestone payments upon the occurrence of certain events up to and including the approval of the NDA in the United States. Payment may be in cash or subject to certain conditions in the Company's Common Stock or Notes. At closing, the Company paid Elan $5.0 million through the issuance of 429,185 shares of the Company's Common Stock ($11.65 per share) and $10.0 million from the issuance of Notes. The total $15.0 million consideration was written off as in-process technology in a one-time charge to operations.

8. COMMITMENTS

Leases and Equipment Notes Payable

The Company has entered into capital lease and equipment note payable agreements which require monthly payments through January 2004. The carrying value of equipment under these agreements at December 31, 1998 and 1997 was $17.3 million and $16.9 million, respectively. At December 31, 1998 and 1997, accumulated amortization was $7.3 million and $6.0 million, respectively.

The Company has also entered into operating lease agreements for office and research facilities with varying terms through August 2015. The agreements also provide for increases in annual rentals based on changes in the Consumer Price Index or fixed percentage increases varying from 3% to 6%. One of these leases requires an irrevocable standby letter of credit of $1.3 million to secure the performance of the Company's lease obligations.

Rent expense for the years ended December 31, 1998, 1997 and 1996 was $3.2 million, $3.4 million and $3.1 million, respectively.

At December 31, 1998, annual minimum rental payments due under the Company's leases and equipment notes payable are as follows (in thousands):

<TABLE>
<CAPTION>

	OBLIGATIONS UNDER CAPITAL LEASES AND EQUIPMENT NOTES PAYABLE	OPERATING LEASES
<S>	<C>	<C>
1999	$4,104	$ 3,114
2000	4,071	3,174
2001	2,845	2,802
2002	1,607	2,812
2003	682	2,867
Thereafter	--	34,920
Total minimum lease payments	13,309	$49,689
Less amounts representing interest	(1,943)	
Present value of minimum lease payments	11,366	
Less current portion	3,201	
	$8,165	

</TABLE>

In 1997, one of the Company's main operating lease agreements for office and research facilities expired, and the Company moved into a second build-to-suit facility. In early 1997, the Company entered into a 17-year lease and the Company loaned the construction partnership $3.7 million which will be repaid with interest over a 10-year period.

Royalty Agreements

The Company has entered into royalty agreements requiring payments ranging from 1% to 20% of net sales and 10% to 30% of license and other income for certain products developed by the Company. Currently, the Company is making minimum royalty payments under three agreements, of $45,000 per year. Royalty expense under the agreements for the years ended December 31, 1998, 1997 and 1996 was $75,000, $276,000 and $261,000, respectively.

In May 1998, the Company elected to make a final one-time $4.1 million royalty payment to the Salk Institute as an alternative to paying future royalty payments based on total net sales of defined potential products. The one-time payment will be amortized over the remaining life of the related patents.

No royalty payments have been received by the Company.

9. STOCKHOLDERS' EQUITY

Warrants

At December 31, 1998, the Company had outstanding warrants to purchase 4,486,404 shares of the Company's Common Stock, of which 4,228,154 warrants relate to the ALRT transaction ("ALRT warrants") (see Note 11). The ALRT warrants have an exercise price of $7.12 per share, the additional warrants have exercise prices ranging from $1.80 to $20.0 per share and expire at various dates through April 24, 2003.

In December 1998, the Company received net proceeds of approximately $12.5 million from investors who elected to exercise their ALRT warrants to purchase 2,267,836 shares. The Company agreed to pay a cost of money incentive to the investors for the early exercise of those warrants.

Stock Plans

The Company's 1992 Stock Option Stock Issuance Plan incorporates all outstanding stock options and unvested share issuances under a prior plan. In May of years 1993 through 1998 inclusive, the plan was amended to increase the aggregate shares available for grant or issuance to 8,088,457 shares of Common Stock. The large majority of the options granted have 10 year terms and vest and become fully exercisable at the end of four years of continued employment. As part of this plan, on the date of the Glycomed Merger, all outstanding in-the-money stock options from Glycomed's stock option plan were converted into options to purchase 470,008 shares of the Company's Common Stock based on the exchange ratio in effect. The Company's employee stock purchase plan also provides for the sale of up to 260,000 shares of the Company's Common Stock.

Pro forma information regarding net loss and loss per share is required by SFAS 123, and has been determined as if the Company had accounted for its employee stock options under the fair value method of that Statement. The fair value for these options was estimated at the dates of grant using a Black-Scholes option pricing model with the following weighted-average assumptions for 1998, 1997 and 1996:

<TABLE>
<CAPTION>

	1998	1997	1996
<S>	<C>	<C>	<C>
Risk free interest rates.....	4.1% - 5.5%	6.1% - 6.9%	5.3% - 6.6%
Dividend yields.....	--	--	--
Volatility.....	62.0%	42.7%	44.4%
Weighted average expected life.....	5 or 7 years	5 or 7 years	5 or 7 years

</TABLE>

The Black-Scholes option valuation model was developed for use in estimating the fair value of traded options which have no vesting restrictions and are fully transferable. In addition, option valuation models require the input of highly subjective assumptions including the expected stock price volatility. Because the Company's employee stock options have characteristics significantly different from those of traded options, and because changes in the subjective input assumptions can materially affect the fair value estimate, in management's opinion, the existing models do not necessarily provide a reliable single measure of the fair value of its employee stock options.

For purposes of pro forma disclosures, the estimated fair value of the options is amortized to expense over the options' vesting period. The Company's pro forma information is as follows (in thousands, except for net loss per share information):

<TABLE>
<CAPTION>

	YEARS ENDED DECEMBER 31,		
	1998	1997	1996
<S>	<C>	<C>	<C>
Net loss as reported.....	$(117,886)	$(100,150)	$(37,313)
Net loss pro forma.....	(121,916)	(102,929)	(39,210)
Net loss per share as reported.....	(2.92)	(3.02)	(1.30)
Net loss per share pro forma.....	(3.01)	(3.11)	(1.36)

</TABLE>

The pro forma effect on net loss for 1998, 1997 and 1996 is not

representative of the pro forma effect on net loss in future years because it does not take into consideration pro forma compensation expense related to grants made prior to 1995.

Following is a summary of the Company's stock option plans activity and related information:

<TABLE>
<CAPTION>

	SHARES	WEIGHTED AVERAGE PRICE RANGE	WEIGHTED AVERAGE EXERCISE PRICE
<S>	<C>	<C>	<C>
Balance at December 31, 1995	3,604,106	$ .29 - 11.59	$ 7.33
Granted	974,015	10.31 - 16.38	12.85
Exercised	(498,456)	.22 - 12.75	5.61
Cancelled	(282,783)	3.89 - 13.31	7.91
Balance at December 31, 1996	3,796,882	.22 - 16.38	9.55
Granted	875,339	9.50 - 16.06	12.75
Exercised	(384,340)	.68 - 14.50	8.59
Cancelled	(219,375)	5.50 - 16.06	10.65
Balance at December 31, 1997	4,068,506	.68 - 16.06	10.26
Granted	1,584,604	9.31 - 15.00	11.10
Exercised	(211,524)	.68 - 16.13	7.52
Cancelled	(396,567)	.68 - 16.38	11.30
Balance at December 31, 1998	5,045,019	$ .68 - 16.38	$10.56
Options exercisable at December 31, 1998	2,814,876	$ .68 - 16.38	

</TABLE>

Of the total options granted from 1995 through 1998, 4,923,491 were granted at a price equal to the fair value of the options at the time of grant, and 58,012 were granted at a price below the fair value of the options at the time of grant.

Following is a further breakdown of the options outstanding as of December 31, 1998:

<TABLE>
<CAPTION>

RANGE OF EXERCISE PRICES	OPTIONS OUTSTANDING	WEIGHTED AVERAGE REMAINING LIFE IN YEARS	WEIGHTED AVERAGE EXERCISE PRICE
<S>	<C>	<C>	<C>
$ .68 - $ .79	2,740	1.43	$ .72
4.68 - 9.21	1,389,481	5.56	7.74
9.31 - 11.25	1,767,495	7.98	10.09
11.26 - 13.31	1,484,516	8.11	12.45
$14.50 - $16.38	400,787	8.76	15.37
	5,045,019		$10.56

</TABLE>

At December 31, 1998, 240,807 shares were available under the plans for future grants of stock options or sale of stock.

For certain shares issued under these plans and certain other issuances of stock, the Company has recognized as compensation and consulting expense the excess of the deemed value for accounting purposes over the aggregate issue price for such shares. The compensation expense is amortized ratably over the

vesting period of each share.

Amortization of deferred compensation and consulting for the years ended December 31, 1998, 1997 and 1996 was none, $322,000 and $497,000, respectively.

Shareholder Rights Plan

In September 1996, the Company's Board of Directors adopted a preferred shareholder rights plan (the "Shareholder Rights Plan"), as amended, which provides for a dividend distribution of one preferred share purchase right (a "Right") on each outstanding share of the common stock. Each Right entitles stockholders to buy 1/1000th of a share of Ligand Series A Participating Preferred Stock at an exercise price of $100, subject to adjustment. The Rights will become exercisable following the tenth day after a person or group announces an acquisition of 20% or more of the Common Stock, or announces commencement of a tender offer, the consummation of which would result in ownership by the person or group of 20% or more of the Common Stock. The Company will be entitled to redeem the Rights at $0.01 per Right at any time on or before the earlier of the tenth day following acquisition by a person or group of 20% or more of the common stock and September 13, 2006.

10. COLLABORATIVE RESEARCH AGREEMENTS

Eli Lilly and Company

In November 1997, the Company entered into a strategic alliance with Eli Lilly and Company ("Lilly") for the discovery and development of products based on Ligand's Intracellular Receptor technology. Lilly made an investment of $37.5 million by purchasing 2,176,279 shares of the Company's Common Stock at $17.23 per share at the inception of the agreement. The price per share included a 20% premium to the market value as defined in the agreement. The 20% premium was in recognition of Ligand's past research and development efforts and accordingly, $6.25 million (the premium) was included in 1997 revenues. Ligand also received a $12.5 million up-front non-refundable milestone payment following inception of the agreement. Under the agreement, Lilly also agreed to support up to $49 million in research funding. Revenues for research funding are recognized ratably over the term of the agreement. Revenues recognized under the agreement for the years ended December 31, 1998 and 1997 were $10.0 and $19.7 million, respectively. The Company also has the option to obtain selected rights to one Lilly specialty pharmaceutical product. Should the Company elect to obtain selected rights to the product, Lilly could receive milestone payments of up to $20 million payable in the Company's Common Stock. In the event that Ligand does not exercise this product option during the first 120 days after the effective date of the agreements, the Company will sell an additional $20 million in equity to Lilly at a 20% premium to the then current market price, and the Company will qualify for certain additional royalties of up to 1.5% on net sales of the Company's choice of Targetin(R) (LGD1069), LGD1268 or LGD1324.

SmithKline Beecham Corporation

In February 1995, the Company entered into a research collaboration with SmithKline Beecham Corporation ("SmithKline Beecham") to discover and characterize small molecule drugs to control hematopoiesis. Revenues under the agreement are recognized ratably over the term of the agreement. Revenues recognized under the agreement for the years ended December 31, 1998, 1997 and 1996 were $3.7 million, $3.2 million and $2.4 million, respectively. SmithKline Beecham has agreed to provide the Company up to $21.5 million in research funding and equity investments. SmithKline Beecham made an investment of $5.0 million by purchasing 674,127 shares of the Company's Common Stock at $7.41 per share at the inception of the agreement. In November 1995, a second equity investment of $2.5 million by purchasing 260,200 shares of the Company's Common Stock at $9.60 per share, was provided to the Company upon the achievement of certain milestones. In January 1997, a third installment of equity investment of $2.5 million by purchasing 164,474 shares of the Company's Common Stock at $15.20 per share was provided to the Company as a result of SmithKline Beecham's election to expand the scope of research as defined. The final installment of $2.5 million was provided in October 1997 as a convertible note as a result of

Beecham's election to extend the collaboration. The note is convertible into the Company's Common Stock at $13.56 per share and is due October 2002 unless converted into the Company's Common Stock earlier. The interest rate on the note is payable semi-annually at prime.

In April 1998, SmithKline Beecham plc. and the Company initiated a new collaboration to develop small molecule drugs for the treatment or prevention of obesity. As part of the collaboration, SmithKline Beecham plc. purchased 274,423 shares of Ligand Common Stock for $5.0 million ($18.22 per share), a 20 percent premium over a 15-day average of the daily closing price of the Company's Common Stock prior to execution of the agreement, which premium has been deferred and will be recognized as revenue over two years and also purchased for $1 million a warrant to purchase 150,000 shares of Ligand Common Stock at $20 per share. The warrant expires in five years, and Ligand may require SmithKline Beecham plc. to exercise the warrant under certain circumstances after three years. SmithKline Beecham plc. will also purchase additional Ligand Common Stock at a 20 percent premium if a certain research milestone is achieved and will make cash payments to Ligand if subsequent milestones are met.

American Home Products Corporation

In September 1994, the Company entered into a collaborative research agreement with Wyeth-Ayerst Laboratories, the pharmaceutical division of American Home Products ("AHP"), to discover and develop drugs which interact with the estrogen or progesterone receptors. AHP agreed to provide up to $19.0 million of the Company's research activities, to invest $5.0 million by purchasing 574,513 shares of the Company's Common Stock at $8.70 per share, and to provide, in three installments, up to $20.0 million in convertible notes over the life of the agreement.

In January 1996, the Company and AHP expanded and amended the research and development collaboration. The Company received $1.5 million in additional research revenue from AHP, AHP expanded the research funding by $1.0 million in years two and three of the agreement, the contract-specified milestone payments increased, AHP granted rights to the Company to cause the conversion of the convertible note into Common Stock, and the parties agreed to extend the period for Ligand to draw down the second convertible note installment until December 1996.

Revenues under the agreement, which was completed in September 1998, were recognized ratably over the term of the agreement. Revenues recognized under the agreement for the years ended December 31, 1998, 1997 and 1996 were $1.3 million, $4.0 million and $6.9 million, respectively. The $5.0 million equity investment plus the initial $10.0 million convertible note was provided to the Company upon inception of the agreement. In the second quarter of 1995, the Company achieved certain milestones which qualified the Company to receive the second installment of a $5.0 million convertible note, which the Company elected to receive in December 1996. The final convertible note installment of $5.0 million will be provided if the collaboration agreement is extended from three to five years. The first two notes are convertible into the Company's Common Stock at $10.01 per share and the final note is convertible at $10.88 per share. The conversion prices are subject to adjustment if certain dilutive events occur to the Company's outstanding Common Stock. In August 1996, March 1997, July 1997, December 1997 and again in June 1998, the Company converted $3.8 million, $3.8 million, $2.5 million, $1.3 million and $3.8 million of the convertible notes outstanding into 374,626, 374,626, 249,749, 124,875 and 374,626 shares of Common Stock, at the $10.01 conversion price. These were no convertible notes outstanding at December 31, 1998.

Abbott Laboratories

In July 1994 the Company entered into a long-term collaborative research agreement with Abbott Laboratories ("Abbott") to discover and develop drugs for the prevention or treatment of inflammatory

diseases. Abbott agreed to support up to $16.0 million of the Company's research activities over a five-year period in connection with the agreement.

Revenues under the agreement are recognized ratably over the term of the agreement and for the years ended December 31, 1998, 1997 and 1996 revenues were $1.2 million, $1.7 million and $2.5 million, respectively. Abbott made an equity investment of $5.0 million by purchasing 571,305 shares of the Company's Common Stock at $8.75 per share at the inception of the agreement, and in August 1995 Abbott made another equity investment of $5.0 million by purchasing 516,129 shares of the Company's Common Stock at $9.68 per share, as provided in the contract.

Sankyo Company, Limited

As part of the Glycomed Merger in May 1995, the Company acquired a collaborative research agreement with Sankyo Company, Limited ("Sankyo") which Glycomed had entered into in June 1994. Under the agreement, Sankyo reimbursed a portion of the Company's research expenses related to the collaboration up to an aggregate of $8.9 million. Revenues under the agreement were recognized ratably over the term of the agreement. Revenues recognized under the agreement and for the years ended December 31, 1997 and 1996 were $2.3 million and $2.7, respectively.

In connection with the collaborative research agreement, in September 1995, Sankyo purchased 189,274 shares of the Company's Common Stock at $7.92 per share for net proceeds of $1.5 million. In June 1997, the collaborative research agreement was extended through October 1997.

Glaxo-Wellcome plc

In September 1992 the Company entered into a five-year collaborative research agreement with Glaxo-Wellcome plc ("Glaxo") to develop drugs for the treatment of cardiovascular disease. Under the agreement, Glaxo reimbursed a portion of the Company's research expenses related to the collaboration to a maximum of approximately $2.0 million annually. Revenues under the agreement are recognized ratably over the term of the agreement. Revenues recognized under the agreement for the years ended December 31, 1997 and 1996 were $1.3 million and $2.1 million, respectively. In connection with the agreement, Glaxo purchased 662,755 shares of the Company's Common Stock at $11.31 per share for net proceeds of $7.5 million. Glaxo also purchased 315,465 shares of the Company's Common Stock at $7.92 per share as part of the Company's initial public offering for net proceeds of $2.5 million.

Pfizer Inc.

In 1991, the Company entered into a collaborative research and development and license agreement with Pfizer Inc. ("Pfizer") to perform services related to the joint development of pharmaceuticals for the treatment of osteoporosis. Due to the early success in meeting research-stage objectives for drug candidates, the two companies phased out the ongoing research collaboration by July 1, 1994.

In connection with the collaborative research agreement, Pfizer purchased 1,353,125 shares of the Company's Common Stock for $5.54 per share for net proceeds of $7.5 million.

In December 1994, the Company filed suit against Pfizer in the Superior Court of California in San Diego County for breach of contract and for a declaration of future rights as they relate to droloxifene, a compound upon which the Company performed work at Pfizer's request during a collaboration between Pfizer and the Company to develop drugs in the field of osteoporosis. Droloxifene is an estrogen antagonist/partial against with potential indications in the treatment of osteoporosis and breast cancer as well as other applications. The Company and Pfizer entered into a settlement agreement with respect to the lawsuit in April 1996. Under the terms of the settlement agreement, the Company is entitled to receive milestone payments if

Pfizer continues development and royalties if Pfizer commercializes droloxifene. At the option of either party, milestone and royalty payments owed the Company can be satisfied by Pfizer transferring to the Company shares of Common Stock at an exchange ratio of $12.375 per share. At the time of the settlement, the Company received approximately $1.3 million in milestone payments from Pfizer as a result of the continued development of droloxifene. These milestones were paid in the form of an aggregate of 101,011 shares of Common Stock, which were subsequently retired from treasury stock in September 1996. According to prior announcements by Pfizer, droloxifene is in Phase II clinical trials for osteoporosis.

11. ALLERGAN LIGAND RETINOID THERAPEUTICS, INC. -- RELATED PARTY

In December 1994, the Company and Allergan, Inc. ("Allergan") formed Allergan Ligand Retinoid Therapeutics, Inc. ("ALRT") to continue the research and development activities previously conducted by Allergan-Ligand Joint Venture ("the Joint Venture"). In June 1995, the Company and ALRT completed a public offering of 3,250,000 units (the "Units") with aggregate proceeds of $32.5 million (the "ALRT Offering") and cash contributions by Allergan and Ligand of $50.0 million and $17.5 million, respectively, providing for net proceeds of $94.3 million for retinoid product research and development. Ligand's $17.5 million in cash contribution, as well as warrants were in exchange for (1) a right to acquire all of the Callable Common Stock at specified future dates and amounts and (2) a right to acquire all rights to the Panretin(R) (ALRT 1057) product, jointly with Allergan. Allergan's $50.0 million cash contribution to ALRT was in exchange for (1) the right to acquire one-half of technologies and other assets in the event Ligand exercises its right to acquire all of the Callable Common Stock, (2) a similar right to acquire all of the Callable Common Stock if Ligand does not exercise its right and (3) a right to acquire all rights to the Panretin (ALRT1057) product, jointly with Ligand. Each Unit consisted of one share of ALRT's callable common stock and two warrants, each warrant entitling the holder to purchase one share of the Company's Common Stock. Immediately prior to the consummation of the ALRT Offering, Allergan Pharmaceuticals (Ireland) Ltd., Inc. made a $6.0 million investment by purchasing 994,819 shares of the Company's Common Stock at $6.03 per share. The Company's $17.5 million cash contribution resulted in a one-time charge to operations. The Company also recorded a warrant subscription receivable and corresponding increase in paid-in capital of $5.9 million (6,500,000 warrants valued at $.90 per warrant) pursuant to the ALRT Offering. From June 3, 1995 through September 23, 1997, cash received from ALRT pursuant to a Research and Development Agreement was prorated between contract revenue and the warrant subscription receivable based on their respective values. In 1997 and 1996, $1.5 million and $2.1 million, respectively, of the proceeds received from ALRT were applied to the warrant subscription receivable. In conjunction with the consummation of the ALRT Offering, all rights held by the Joint Venture were licensed to ALRT.

In September 1997, the Company and Allergan exercised their respective options to purchase the Callable Common Stock (the "Stock Purchase Option") and certain assets (the "Asset Purchase Option") of ALRT. The Company's exercise of the Stock Purchase Option required the issuance of 3,166,567 shares of the Company's Common Stock along with cash payments totaling $25.0 million to holders of the Callable Common Stock in November 1997.

Allergan's exercise of the Asset Purchase Option required a cash payment of $8.9 million which was used by the Company to pay a portion of the Stock Purchase Option.

In November 1997, ALRT became a wholly owned subsidiary of the Company. The transaction was accounted for using the purchase method of accounting. The excess of the purchase price over the fair value of the net assets acquired was allocated to in-process technology and was written off, resulting in a one-time non-cash charge to results of operations of $65.0 million.

Details of the acquisition are as follows (in thousands):

<TABLE>
<S> <C>

Total consideration:	
Common stock	$52,595
Liabilities assumed	1,010
Warrant subscription receivable write-off	918
Net cash paid for ALRT net of cash received	12,661
	$67,184
Less:	
Deferred liabilities write-off	$ 2,214
Write-off of in-process technology	64,970
	$67,184

</TABLE>

12. NOTES RECEIVABLE FROM OFFICERS AND EMPLOYEES

The Company has advanced funds to certain officers and employees in connection with various employment agreements. The agreements provide for forgiveness of the advances over four-year and five-year periods. If an individual terminates the relationship with the Company, the unforgiven portion of the advances and any accrued interest are due and payable upon termination. The notes are secured by shares of the Company's Common Stock owned by the individual or second trust deeds on the personal residences of the respective employees.

13. INCOME TAXES

At December 31, 1998, the Company had consolidated federal and combined California income tax net operating loss carryforwards of approximately $354.6 million and $21.9 million, respectively. The difference between the federal and California tax loss carryforwards is primarily attributable to the capitalization of research and development expenses for California income tax purposes and the 50% limitation on California loss carryforwards. The Company also had foreign net operating loss carryforwards of approximately $3.1, which will begin to expire in 2001 unless previously utilized.

The federal tax loss carryforward will begin to expire in 2002, unless previously utilized. The California tax loss carryforwards began expiring in 1998 (approximately $4.0 expired in 1998). The Company also had consolidated federal and combined California research tax credit carryforwards of approximately $14.3 million and $4.5 million, respectively, which will begin to expire in 2002 unless previously utilized.

Pursuant to Internal Revenue Code Sections 382 and 383, use of a portion of net operating loss and credit carryforwards will be limited because of cumulative changes in ownership of more than 50% which occurred within three year periods during 1989, 1992 and 1996. However, the Company does not believe the limitations will have a material impact upon the future utilization of these carryforwards. In addition, use of Glycomed's and Seragen's preacquisition tax net operating and credit carryforwards will also be limited because the acquisitions by the Company represent changes in ownership of more than 50%. Such tax net operating losses and credit carryforwards have been reduced, including the related deferred tax assets.

Significant components of the Company's deferred tax assets as of December 31, 1998 and 1997 are shown below. A valuation allowance has been recognized to fully offset the deferred tax assets as of December 31, 1998 and 1997 as realization of such assets is uncertain.

<TABLE>
<CAPTION>

	1998	1997
	(IN THOUSANDS)	
<S>	<C>	<C>
Deferred tax liability:		
Acquired subordinated debt	$ 4,387	$ 5,483
Purchased intangible assets	17,621	--
Fixed assets	2,684	--
Total deferred tax liabilities	24,692	5,483
Deferred tax assets:		
Net operating loss carryforwards	126,771	82,552
Research and development credits	17,218	9,979
Capitalized research and development	13,604	10,252
Capitalized license	6,150	--
Other	2,940	3,472
Total deferred tax assets	166,683	106,255
Valuation allowance for deferred tax assets	(141,991)	(100,772)
Net deferred tax assets	$ --	$ --

</TABLE>

Approximately $2.1 million of the valuation allowance for deferred tax assets relates to benefits of stock option deductions which, when recognized, will be allocated directly to paid-in capital.

EXHIBIT 10.194

ELEVENTH ADDENDUM TO AMENDED REGISTRATION RIGHTS AGREEMENT

This Eleventh Addendum ("Addendum") to the Amended Registration Rights Agreement dated June 24, 1994, as amended through the date hereof ("Registration Rights Agreement") between Ligand Pharmaceuticals Incorporated (the "Company"), Elan Corporation, plc ("Elan"), and Elan International Services, Ltd. ("EIS") is effective as of November 9, 1998.

RECITALS

A. The Company has issued 437,768 shares of the Company's Common Stock (the "Shares") and Zero Coupon Convertible Senior Notes due 2008 with an aggregate issue price of $40,000,000, and may in the future issue additional Zero Coupon Convertible Senior Notes due 2008 with up to an aggregate issue price of $70,000,000 (collectively, the "Notes"), to EIS pursuant to Section 1 of that certain Securities Purchase Agreement dated the date hereof among the Company. Elan and EIS (the "Securities Purchase Agreement").

B. The Company and Elan have entered into that certain Development, License and Supply Agreement dated the date hereof (the "License Agreement") pursuant to which the Company has issued 429,185 shares of Common Stock (the "License Shares"), and may in the future issue additional shares of its Common Stock to Elan in satisfaction of certain royalty payments provided for therein.

C. This Addendum serves to include the Shares and any shares of the Company's Common Stock issuable upon the conversion of the Notes or pursuant to the terms of the License Agreement within the definition of "Registrable Securities" under the Registration Rights Agreement, to modify Schedule A to the Registration Rights Agreement to include the Shares, and to provide that Schedule A to the Registration Rights Agreement shall be further updated to include any shares issued upon the conversion of the Notes or pursuant to the terms of the License Agreement, all pursuant to Section 2.6(a) of the Registration Rights Agreement.

NOW, THEREFORE, in consideration of the mutual promises and covenants set forth in the Registration Rights Agreement, the parties agree as follows:

1. Section 1. 1, paragraph (f) of the Registration Rights Agreement is hereby restated in its entirety as follows:

"(f) The term "Registrable Securities" means (i) the Common Stock issuable or issued upon exercise of those warrants issued to certain Existing Investors and pursuant to which such Existing Investors were previously granted registration rights by the Company, (ii) the shares of Common Stock (or the shares of such other class of stock into which the Common Stock is converted) issuable upon conversion of those certain Unsecured Convertible Promissory Notes issued to American Home Products Corporation pursuant to the Stock and Note Purchase Agreement dated September 2, 1994, (iii) the 35,957 shares of Common Stock issuable or issued upon exercise of the Warrant issued to

Genentech, Inc. in connection with the merger of L.G. Acquisition Corp., a wholly-owned subsidiary of the Company, with and into Glycomed Incorporated, which shares are reflected on Schedule A attached to the Fourth Addendum to this Agreement, (iv) the 164,474 shares of Common Stock (or that number of shares of such other class of stock into which the Common Stock is converted) issued to S.R. One Limited pursuant to a Stock and Note Purchase Agreement dated February 3, 1995 (the "Stock and Note Purchase Agreement"), which shares are reflected on Schedule A attached to the Eighth Addendum to this Agreement, and the shares of Common Stock (or the shares of such other class of stock into which the Common Stock is converted) issuable upon conversion of those certain Unsecured Convertible Promissory Notes dated October 30, 1997 (the "S.R. One Notes") issued pursuant to the Stock and Note Purchase Agreement

(and upon such conversion of the S.R. One Notes, Schedule A shall be updated to include such shares), (v) the 274,423 shares of Common Stock (or that number of shares of such other class of stock into which the Common Stock is converted) issued to SmithKline Beecham plc pursuant to a Stock Purchase Agreement dated April 24, 1998 (the "SmithKline Stock Purchase Agreement"), which shares are reflected on Schedule A attached to the Ninth Addendum to this Agreement, and the shares of Common Stock (or the shares of such other class of stock into which the Common Stock is converted) issuable upon conversion of that certain Warrant (the "Warrant") issued pursuant to the SmithKline Stock Purchase Agreement (and upon such conversion of the Warrant, Schedule A shall be updated to include such shares), (vi) the 1,278,970 shares of Common Stock (or that number of shares of such other class of stock into which the Common Stock is converted) issued to Elan International Services, Ltd. pursuant to the Stock Purchase Agreement dated September 30, 1998, which shares are reflected on Schedule A attached to the Tenth Addendum to this Agreement, (vii) the 437,768 shares of Common Stock (or that number of shares of such other class of stock into which the Common Stock is converted) issued to Elan International Services, Ltd. pursuant to the Securities Purchase Agreement, dated November 6, 1998 (the "Securities Purchase Agreement") (viii) the shares of Common Stock (or the shares of such other class of stock into which the Common Stock is converted) issuable upon conversion of the Notes issued pursuant to the Securities Purchase Agreement (and upon such conversion of the Notes, Schedule A shall be updated to include such shares), (viii) the 429,185 shares of Common Stock (or the shares of such other class of stock into which the Common Stock is converted) issued to Elan Corporation, plc pursuant to the Development, License and Supply Agreement dated November 9, 1998 (the "License Agreement"), (ix) the shares of Common Stock that may be issued to Elan Corporation, plc pursuant to the License Agreement (and upon each such issuance, Schedule A shall be updated to include such shares), and (x) any Common Stock of the Company issued as (or issuable upon the conversion or exercise of any warrant, right or other security which is issued as) a dividend or other distribution with respect to, or in exchange for or in replacement of the shares referenced in (i), (ii), (iii), (iv), (v), (vi), (vii), (viii), and (ix) above, excluding in all cases, however, any Registrable Securities

sold by a person in a transaction in which rights under this Agreement are not assigned."

2. Schedule A of the Registration Rights Agreement is hereby restated in its entirety as attached to this Addendum.

3. This Addendum may be executed in one or more counterparts.

4. This Addendum shall be binding upon the Company, Elan and EIS and each holder of Registrable Securities and each future holder of Registrable Securities pursuant to Section 2.6(a) of the Registration Rights Agreement.

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, the parties have executed this Addendum as of the date first above written.

ELAN INTERNATIONAL SERVICES, LTD.	LIGAND PHARMACEUTICALS INCORPORATED
By: ----------	By: /s/ William L. Respess ----------
Title ----------	Senior Vice President, General Title: Counsel, Government Affairs ----------

ELAN CORPORATION, PLC

By:

Title:

[SIGNATURE PAGE TO ELEVENTH ADDENDUM TO
AMENDED REGISTRATION RIGHTS AGREEMENT]

IN WITNESS WHEREOF, the parties have executed this Addendum as of the date first above written.

ELAN INTERNATIONAL SERVICES, LTD.	LIGAND PHARMACEUTICALS INCORPORATED
By: /s/ Kevin Insley	By:
Title PRESIDENT & CFO	Title:

ELAN CORPORATION, PLC

By:

Title:

[SIGNATURE PAGE TO ELEVENTH ADDENDUM TO
AMENDED REGISTRATION RIGHTS AGREEMENT]

IN WITNESS WHEREOF, the parties have executed this Addendum as of the date first above written.

ELAN INTERNATIONAL SERVICES, LTD.	LIGAND PHARMACEUTICALS INCORPORATED
By:	By:
Title	Title:

ELAN CORPORATION, PLC

By: /s/ William F. Daniel

Title: GROUP VICE PRESIDENT, FINANCE

[SIGNATURE PAGE TO ELEVENTH ADDENDUM TO
AMENDED REGISTRATION RIGHTS AGREEMENT]

EXHIBIT 10.195

THE SECURITY EVIDENCED HEREBY HAS NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT UNDER THE ACT OR PURSUANT TO A VALID EXEMPTION THEREFROM AND HAS BEEN SOLD IN RELIANCE ON THE EXEMPTION FROM REGISTRATION PROVIDED BY REGULATION S UNDER THE ACT ("REGULATION S"). THE SECURITY EVIDENCED HEREBY MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF EXCEPT IN ACCORDANCE WITH THE PROVISIONS OF REGULATION S (SECTION 230.901 THROUGH SECTION 230.905, AND PRELIMINARY NOTES).

THE TRANSFER OF THE SECURITY EVIDENCED HEREBY IS SUBJECT TO THE CONDITIONS SPECIFIED IN A SECURITIES PURCHASE AGREEMENT, DATED AS OF NOVEMBER 6, 1998, BY AND AMONG THE COMPANY, ELAN INTERNATIONAL SERVICES, LTD. AND ELAN CORPORATION, PLC, AND THE COMPANY RESERVES THE RIGHT TO REFUSE THE TRANSFER OF SUCH SECURITY UNTIL SUCH CONDITIONS HAVE BEEN FULFILLED WITH RESPECT TO SUCH TRANSFER. A COPY OF SUCH CONDITIONS WILL BE FURNISHED BY THE COMPANY TO THE HOLDER HEREOF WITHOUT CHARGE.

LIGAND PHARMACEUTICALS INCORPORATED

ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

No. R-1

Issue Date: November 9, 1998

Issue Price: $30,000,000
($456.39 for each $1,000 Principal Amount)

Original Issue Discount at Maturity: $35,733,694
($543.61 for each $1,000 Principal Amount)

Ligand Pharmaceuticals Incorporated, a Delaware corporation, promises to pay to Elan International Services, Ltd. or registered assigns, on November 9, 2008, the Principal Amount of SIXTY FIVE MILLION SEVEN HUNDRED AND THIRTY THREE THOUSAND SIX HUNDRED AND NINETY FOUR DOLLARS ($65,733,694) or such Principal Amount as may result from an Accrual Increase as specified on the other side of this Security.

This Security shall not bear interest except as specified on the other side of this Security. Original Issue Discount will accrue as specified on the other side of this Se-

curity. This Security is convertible into Common Stock as specified on the other side of this Security.

Additional provisions of this Security are set forth on the other side of this Security.

This Security is one of the Zero Coupon Convertible Senior Notes due 2008 issued pursuant to the Securities Purchase Agreement, dated as of November 6, 1998, by and among Ligand Pharmaceuticals Incorporated, Elan International Services, Ltd. and Elan Corporation, plc (the "Purchase Agreement").

IN WITNESS WHEREOF, Ligand Pharmaceuticals Incorporated has caused this instrument to be duly executed.

LIGAND PHARMACEUTICALS
INCORPORATED

By: /s/ WILLIAM L. RESPESS

Name: William L. Respess
Title: Senior Vice President, General Counsel, Government Affairs

Attest

By: /s/ DAVID E. ROBINSON

Name: David E. Robinson
Title: President and Chief Executive Officer

Dated:

FORM OF REVERSE SIDE OF SECURITY

LIGAND PHARMACEUTICALS INCORPORATED

ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

1. INTEREST

(a) This Security shall not bear interest, except as specified in this paragraph or in paragraph 12 hereof. If the Principal Amount hereof or any portion of such Principal Amount is not paid when due (whether upon acceleration pursuant to paragraph 9 hereof, upon the date set for payment of the Redemption Price pursuant to paragraph 3 hereof, upon the date set for payment of a Purchase Price or a Company Change of Control Purchase Price pursuant to paragraph 4 hereof, upon the date set for payment of the Elan Change of Control Purchase Price pursuant to paragraph 5 hereof or upon the Stated Maturity of this Security) or if shares of Common Stock (and cash in lieu of fractional shares) in respect of a conversion of this Security in accordance with paragraph 6 hereof are not delivered when due, then, in each such case, the overdue amount shall bear interest at the rate of 10.0% per annum, compounded semiannually (to the extent that the payment of such interest shall be legally enforceable), which interest shall accrue from the date such overdue amount was due to the date payment of such amount, including interest thereon, has been made. All such interest shall be payable on demand. The accrual of such interest on overdue amounts shall be in lieu of, and not in addition to, the continued accrual of Original Issue Discount.

(b) Original Issue Discount (the difference between the Issue Price and the Principal Amount of a Security) in the period during which a Security remains outstanding shall accrue at 8.0% per annum, on a semiannual bond equivalent basis using a 360-day year consisting of twelve 30-day months, commencing on the Issue Date of this Security, and shall cease to accrue on the earlier of (i) the date on which the Principal Amount hereof or any portion of such Principal Amount becomes due and payable and (ii) any Redemption Date, Purchase Date, Company Change of Control Payment Date, Elan Change of Control Payment Date or Conversion Date.

(c) In the event that the Company defaults in the performance or observance of any agreement, covenant, term or condition contained in the Registration Rights Agreement or the New Registration Rights Agreement, as the case may be, and such

default continues for a period of 30 days after receipt by the Company of notice thereof (provided that, if such default is not cured on or prior to the last day of such 30 day period and such breach is then capable of being cured and the

Company is then working in good faith to cure such default, such 30 day period shall be extended by an additional 20 days from the last day of such 30 day period) (a "Registration Rights Default"), the Company acknowledges that the Holders of the Securities will suffer damages and that it would not be feasible to ascertain the extent of such damages with precision. Accordingly, the Company agrees that, as liquidated damages, the rate at which Original Issue Discount or interest pursuant to paragraph 1(a) or 12 hereof, if any, accrues shall be increased over and above the rate stated in paragraph 1(b), 1(a) and 12(a), respectively (an "Accrual Increase"), by an additional 50 basis points for each 90-day period in which a Registration Rights Default continues; provided that the aggregate of such Accrual Increase shall not exceed 200 basis points over and above the rate set forth in paragraph 1(b), 1(a) and 12(a) hereof, as the case may be; provided, further, that any Accrual Increase shall immediately cease upon the cure of any such Registration Rights Default. Whenever, in this Security, there is mentioned, in any context, Principal Amount, Original Issue Discount or interest, or any other amount payable under or with respect to this Security, including the Redemption Price, the Purchase Price, the Company Change of Control Purchase Price and the Elan Change of Control Purchase Price, such mention shall be deemed to include mention of an Accrual Increase to the extent that, in such context, such Accrual Increase is, was or would be in effect.

2. METHOD OF PAYMENT

Holders must surrender Securities to the Company to collect payments in respect of the Securities. The Company will pay cash amounts in money of the United States that at the time of payment is legal tender for payment of public and private debts (and all references in the Securities to "$" or "dollars" shall refer to such currency) by wire transfer in immediately available funds, to an account or accounts designated in writing by each Holder not less than 5 Business Days prior to the date of the applicable payment.

3. REDEMPTION AT THE OPTION OF THE COMPANY

(a) No sinking fund is provided for the Securities. The Securities are redeemable as a whole at any time, or in part from time to time, at the option of the Company, at the redemp-

tion prices (each, a "Redemption Price") set forth in paragraph 3(b) hereof; provided that the Securities are not redeemable prior to November 9, 2001.

(b) The table below shows the Redemption Prices of a Security per $1,000 Principal Amount on the dates shown below and at Stated maturity, which prices reflect accrued Original Issue Discount calculated to each such date. The Redemption Price of a Security redeemed between such dates would include an additional amount reflecting the additional Original Issue Discount accrued since the next preceding date in the table to the actual Redemption Date.

<TABLE>
<CAPTION>

Redemption date	(1) Security Issue Price	(2) Accrued Original Issue Discount At 8.0%	(3) Redemption Price (1) + (2)
<S>	<C>	<C>	<C>
November 9, 2001	$456.39	$121.09	$577.48
November 9, 2002	456.39	168.21	624.60
November 9, 2003	456.39	219.17	675.56
November 9, 2004	456.39	274.30	730.69
November 9, 2005	456.39	333.92	790.31
November 9, 2006	456.39	398.41	854.80
November 9, 2007	456.39	468.17	924.56

At maturity.....	456.39	543.61	1,000.00

</TABLE>

If converted to a semiannual coupon note following the occurrence of a Tax Event, the Securities will be redeemable at the Restated Principal Amount plus interest accrued and unpaid from, and including, the date of such conversion to, but excluding, the Redemption Date.

(c) If less than all of the Securities are to be redeemed, the Company shall select the Securities to be redeemed pro rata. If any Security selected for redemption is thereafter surrendered for conversion in part, the converted portion of such Security shall be deemed (so far as may be), solely for purposes of determining the aggregate Principal Amount of Securities to be redeemed by the Company, the portion selected for redemption. Nothing in this paragraph 3 shall affect the right of any Holder to convert any Security pursuant to paragraph 6 hereof.

(d) Provisions of this Security that apply to the redemption of all of a Security also apply to the redemption of any portion of such Security.

(e) At least 30 days but not more than 60 days before a Redemption Date, the Company shall cause notice of redemption to be mailed, by first-class mail, postage prepaid, to each Holder of Securities at such Holder's address appearing on the register maintained by the Company. Such notice shall identify the Securities to be redeemed and shall state:

(i) the Redemption Date;

(ii) the Redemption Price;

(iii) the Conversion Price in effect on the date of such notice;

(iv) that Securities called for redemption may be converted at any time prior to the close of business on the Redemption Date;

(v) that Securities called for redemption must be surrendered to the Company to collect the Redemption Price and the procedures to be followed to so surrender such Securities;

(vi) if fewer than all the outstanding Securities are to be redeemed, the identification and Principal Amounts of the particular Securities to be redeemed;

(vii) that, unless the Company defaults in payment of the Redemption Price, Original Issue Discount on the Securities called for redemption and interest, if any, will cease to accrue on and after the Redemption Date;

(viii) that Holders whose Securities are being redeemed only in part will, without charge, be issued a new Security equal in Principal Amount to the unredeemed portion of the Securities; and

(ix) that the Redemption Price for any Security called for redemption will be paid one Business Day following the later of (x) the Redemption Date and (y) the date such Security is surrendered to the Company.

(f) Once notice of redemption is given, Securities called for redemption shall become due and payable on the Redemption

Date and at the Redemption Price stated in such notice, except for Securities that are converted. The Redemption Price for the Securities called for redemption shall be paid one Business Day following the later of (x) the Redemption Date and (y) the date such Securities are surrendered to the Company.

(g) Receipt by the Company of the Securities called for redemption prior to, on or after the Redemption Date shall be a condition to the receipt by the Holder of the Redemption Price therefor.

(h) Upon surrender of a Security that is redeemed in part, the Company shall, without charge, execute and deliver to the Holder a new Security equal in Principal Amount to the unredeemed portion of such Security.

4. PURCHASE BY THE COMPANY AT THE OPTION OF THE HOLDER

(a) Purchase at the Option of the Holder. The Company shall be obligated to purchase, at the option of the Holder, the Securities held by such Holder on the following purchase dates (each, a "Purchase Date") and at the following purchase prices per $1,000 Principal Amount (each, a "Purchase Price"), which Purchase Prices reflect accrued Original Issue Discount to each such date. Such Purchase Prices may be paid, at the option of the Company, in cash or by the issuance and delivery of shares of Common Stock, subject to the conditions set forth in paragraph 4(a)(iv) hereof.

<TABLE>
<CAPTION>

Purchase Date	(1) Security Issue Price	(2) Accrued Original Issue Discount At 8.0%	(3) Purchase Price (1) + (2)
<S>	<C>	<C>	<C>
November 9, 2002.....	456.39	168.21	624.60
November 9, 2005.....	456.39	333.92	790.31

</TABLE>

If, prior to the Purchase Date, the Securities have been converted to a semiannual coupon note following the occurrence of a Tax Event, the Purchase Price will be equal to the Restated Principal Amount plus interest accrued and unpaid from, and including, the date of such conversion to, but excluding, the Purchase Date.

(i) in order to have Securities purchased pursuant to this paragraph 4(a), the Holder shall (x) deliver to the Company (for each Security or portion thereof to be

purchased) a written notice of purchase in the form attached to this Security as Annex A (a "Purchase Notice") at any time on or prior to the close of business on such Purchase Date and (y) surrender such Securities to the Company prior to, on or after the Purchase Date, such surrender being a condition to receipt by the Holder of the Purchase Price therefor.

Provisions of this Security that apply to the purchase of all of a Security also apply to the purchase of any portion of such Security.

Subject to the right of a Holder to convert Securities as to which a Purchase Notice has been delivered into Common Stock at any time prior to the close of business on the Purchase Date, such Holder may not withdraw such Purchase Notice.

Any purchase of Securities contemplated pursuant to this paragraph 4(a) shall be consummated by the delivery of the Purchase Price to be received by the Holder (in cash or Common Stock, as the case may be) one Business Day following the later of (x) the Purchase Date and (y) the date such Securities are surrendered to the Company.

(ii) The Securities to be purchased pursuant to this paragraph 4(a) may be paid for, at the option of the Company, in cash or Common

Stock, subject to the conditions set forth in paragraph 4(a)(iv) hereof. The Company shall designate, in the Company Notice (as defined below) delivered pursuant to paragraph 4(a)(v) hereof, whether the Company will purchase the Securities for cash or Common Stock; provided that the Company will pay cash for fractional shares of Common Stock pursuant to paragraph 4(a)(iv)(A) hereof. The Company may not change its election with respect to the consideration to be paid once the Company has given the Company Notice, except pursuant to paragraph 4(a)(iv)(B) hereof.

(iii) On each Purchase Date, if the Company Notice shall state that the Company will purchase Securities for cash, the Securities in respect of which a Purchase Notice has been given shall be purchased by the Company with cash in an amount equal to the aggregate Purchase Price of such Securities.

(iv) On each Purchase Date, if the Company Notice shall state that the Company will purchase Securities for

Common Stock, the Securities in respect of which a Purchase Notice has been given shall be purchased by the Company by the issuance of a number of whole shares of Common Stock equal to the quotient obtained by dividing (x) the amount of cash to which the Holder would have been entitled had the Company elected to pay the Purchase Price of such Securities in cash by (y) the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately preceding the Purchase Date, subject to paragraph 4(a)(iv)(A) hereof.

(A) The Company will not issue a fractional share of Common Stock in payment of the Purchase Price. Instead, the Company will pay cash in an amount equal to the current market value of the fractional share. The current market value of a fraction of a share of Common Stock shall be determined by multiplying the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately preceding the Purchase Date by such fraction and rounding to the nearest whole cent, with one-half cent being rounded upward. It is understood that if a Holder elects to have more than one Security purchased, the number of whole shares of Common Stock shall be based on the aggregate amount of Securities to be purchased.

(B) The Company's right to elect to purchase the Securities of any Holder through the issuance of shares of Common Stock shall be conditioned upon the following: (x) assuming compliance with all applicable state securities or "Blue Sky" laws, and assuming the accuracy of the statements of such Holder set forth in the Purchase Notice, the issuance of such shares of Common Stock shall be exempt from the registration requirements of Section 5 of the Securities Act, (y) no consent, approval, authorization or order of any court or governmental agency or body or third party shall be required for the issuance by the Company of such shares of Common Stock and (z) such Holder shall have received an Opinion of Counsel (which shall be included with the Company Notice) stating that the terms of the issuance of such Common Stock are in conformity with this paragraph 4(a), that such Common Stock has been duly authorized and, upon issuance, will be validly issued, nonassessable

and fully paid, will not be issued in violation of any preemptive or similar rights and will be free of any liens, encumbrances or restrictions on transfer imposed by the Company other than those imposed by the Securities Act and applicable state securities or "Blue Sky" laws (provided that such Opinion of Counsel may state that, insofar as it relates to the absence of preemptive or similar rights, it is given upon the best knowledge of such counsel) and that clause (x) of this paragraph 4(a)(iv)(B) has been satisfied.

(C) if the conditions set forth in paragraph 4(a)(iv)(B) hereof are not satisfied as of the Purchase Date, and the Company shall have elected to purchase the Securities through the issuance of shares of Common Stock, the Company shall, without further notice, pay the Purchase Price in cash.

(v) The Company shall cause a notice of its election to pay the Purchase Price with cash or Common Stock (the "Company Notice") to be sent by first-class mail, postage prepaid, to the Holders at their addresses appearing in the register maintained by the Company. The Company Notice shall be sent to Holders on a date not less than 20 Business Days prior to the Purchase Date (such date being herein referred to as the "Company Notice Date"); provided that, in the event that the Company shall not have delivered the Company Notice on or prior to the Company Notice Date, the Company shall be deemed to have irrevocably elected to pay the Purchase Price in cash. The Company Notice shall state the manner of payment elected and shall contain the following information:

In the event that the Company has elected to pay the Purchase Price with Common Stock, the Company Notice shall state that each Holder will receive Common Stock (except for any cash amount to be paid in lieu of fractional shares) in accordance with this paragraph 4(a) and shall be accompanied by the Opinion of Counsel described in paragraph 4(a)(iv)(B) hereof.

In any case, each Company Notice will include the Purchase Notice to be completed by the Holder and shall state:

(A) the Purchase Price on such Purchase Date and the Conversion Price in effect on the date of the Company Notice;

(B) that Securities must be surrendered to the Company to collect payment and any procedures to be followed in so surrendering the Securities;

(C) that Securities as to which a Purchase Notice has been given may be converted at any time prior to the close of business on the applicable Purchase Date;

(D) that, unless the Company defaults in the payment of the Purchase Price, Original Issue Discount on all Securities in respect of which a Purchase Notice has been delivered or interest, if any, will cease to accrue on and after the Purchase Date;

(E) that Holders whose Securities are being purchased only in part will, without charge, be issued a new Security equal in Principal Amount to the unpurchased portion of the Securities; and

(F) that the Purchase Price for any Security as to which a Purchase Notice has been given will be paid one Business Day following the later of (x) the Purchase Date and (y) the date such Security is surrendered to the Company.

(vi) All shares of Common Stock delivered upon purchase of the Securities shall be newly issued shares or treasury shares, shall be duly and validly issued, fully paid and nonassessable, shall not be issued in violation of any preemptive or similar rights and shall be free of any liens, encumbrances or restrictions on transfer other than those imposed by the Securities Act and applicable state securities or "Blue Sky" laws.

(vii) Receipt of such Security by the Company prior to, on or after the Purchase Date shall be a condition to the receipt by the Holder of the Purchase Price therefor.

(viii) on the Business Date immediately following the later of (x) the Purchase Date and (y) the date on which such Securities are surrendered to the Company, the Company shall deliver to each Holder entitled to receive Common Stock a certificate for the number of full shares of

Common Stock issuable in payment of the Purchase Price and cash in lieu of any fractional shares.

(ix) If a Holder is paid in Common Stock, the Company shall pay any documentary, stamp or similar issue or transfer tax due on such issuance of Common Stock.

(x) Upon surrender of a Security that is to be purchased only in part, the Company shall, without charge, execute and deliver to the Holder a new Security equal in Principal Amount to the unpurchased portion of such Security.

(b) Purchase at the Option of the Holder upon Company Change of Control. Upon a Change of Control of the Company, the Company shall be obligated to make an offer to purchase all outstanding Securities (the "Company Change of Control Offer") at a purchase price per $1,000 Principal Amount (the "Company Change of Control Purchase Price") equal to the sum of (x) the Issue Price plus (y) accrued Original Issue Discount to the Company Change of Control Payment Date. If, prior to the Company Change of Control Payment Date, the Securities have been converted to a semiannual coupon note following the occurrence of a Tax Event, the Company Change of Control Purchase Price will be equal to the Restated Principal Amount plus interest accrued and unpaid from, and including, the date of such conversion to, but excluding, the Company Change of Control Payment Date.

(i) within 10 days after the occurrence of a Change of Control of the Company, the Company shall cause a notice of the Company Change of Control Offer (the "Company Change of Control Offer Notice") to be sent by first-class mail, postage prepaid, to the Holders at their addresses appearing in the register maintained by the Company, stating:

(A) the event or events causing such Change of Control of the Company and the date such Change of Control occurred;

(B) that the Company Change of Control Offer is being made pursuant to this paragraph 4(b);

(C) the Company Change of Control Purchase Price and the purchase date (which shall be a Business Day no earlier than 10 days nor later than 30

days from the date such notice is mailed (the "Company Change of Control Payment Date"));

(D) that a Company Change of Control Purchase Notice (as defined below) must be delivered to the Company on or prior to the close of business on the Company Change of Control Payment Date and that Securities must be surrendered to the Company prior to, on or after the Company Change of Control Payment Date to collect payment, including any procedures to be followed in so surrendering the Securities;

(E) that any Security as to which a Company Change of Control Purchase Notice has not been delivered will continue to

accrue Original Issue Discount or interest, if any;

(F) the Conversion Price in effect on the date of the Company Change of Control Offer Notice and any adjustments thereto resulting from such Change of Control;

(G) that the Securities as to which a Company Change of Control Purchase Notice has been given may be converted into Common Stock at any time prior to the close of business on the Company Change of Control Payment Date;

(H) that, unless the Company defaults in the payment of the Company Change of Control Payment, Original Issue Discount on all Securities as to which a Company Change of Control Purchase Notice has been delivered or interest, if any, will cease to accrue on and after the Company Change of Control Payment Date;

(I) that Holders whose Securities are being purchased only in part will, without charge, be issued a new Security equal in Principal Amount to the unpurchased portion of the Securities; and

(J) that the Company Change of Control Purchase Price for any Security as to which a Company Change of Control Purchase Notice has been given will be paid one Business Day following the later of (x) the Company Change of Control Payment Date and (y) the date such Security is surrendered to the Company.

(ii) A Holder may elect to have its Securities purchased pursuant to a Company Change of Control Offer upon delivery of a written notice of purchase (the "Company Change of Control Purchase Notice") to the Company at any time prior to the close of business on the Company Change of Control Payment Date, stating:

(A) the certificate number of each Security which the Holder will deliver to be purchased; and

(B) the portion of the Principal Amount of such Security which the Holder has elected to have purchased.

(iii) Receipt of such Security by the Company prior to, on or after the Company Change of Control Payment Date shall be a condition to the receipt by the Holder of the Company Change of Control Purchase Price therefor.

(iv) Provisions of this Security that apply to the purchase of all of a Security also apply to the purchase of any portion of such Security.

(v) Any purchase of Securities contemplated pursuant to this paragraph 4(b) shall be consummated by the delivery of the Company Change of Control Purchase Price to be received by the Holder one Business Day following the later of (x) the Company Change of Control Payment Date and (y) the date such Securities are surrendered to the Company.

(vi) If any Security is to be purchased only in part, the Company shall, without charge, issue to the Holder a new Security equal in Principal Amount to the unpurchased portion of such Security.

(vii) The Company will comply with the requirements of Section 14(e) under the Exchange Act and any other securities laws and regulations thereunder to the extent such laws and regulations are applicable in connection with the repurchase of the Securities pursuant

to a Company Change of Control Offer. To the extent that the provisions of any securities laws or regulations conflict with the provisions of this paragraph 4(b), the Company shall comply with the applicable securities laws and regulations and shall not be deemed to have breached its obligations under this paragraph 4(b) by virtue thereof.

5. PURCHASE AT THE OPTION OF THE COMPANY UPON ELAN CHANGE OF CONTROL

(a) Upon a Change of Control of Elan occurring prior to November 9, 2001, the Company may, at its option, repurchase (the "Elan Change of Control Purchase") the Securities held by Elan or any of its Affiliates on the date of such Change of Control, in whole but not in part, at a cash purchase price per $1,000 Principal Amount (the "Elan Change of Control Purchase Price") equal to the greater of (i) the sum of (A) the Issue Price plus (B) accrued Original Issue Discount to the Elan Change of Control Payment Date (provided that if, prior to the Elan Change of Control Payment Date, the Securities have been converted to a semiannual coupon note following the occurrence of a Tax Event, the sum set forth in this clause (i) shall be the Restated Principal Amount plus interest accrued and unpaid from, and including, the date of such conversion to, but excluding, the Elan Change of Control Payment Date) and (ii) the product of (a) the number of shares of Common Stock into which the Securities to be redeemed may be converted pursuant to paragraph 6 hereof on the day immediately preceding the Elan Change of Control Payment Date and (b) the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to the Elan Change of Control Payment Date (as defined below); provided that, as a condition to any such repurchase, the Company shall repurchase all, but not less than all, of the Initial Shares, the Shares, the Conversion Shares and the License Shares, in each case, held by Elan and its Affiliates on the date of such Change of Control, pursuant to and in accordance with the terms of the Purchase Agreement.

(b) If an Elan Change of Control Purchase is to be made by the Company, the Company shall, on or prior to the 10th day following receipt of an Elan Change of Control Notice, cause an irrevocable notice of the Elan Change of Control Purchase (the "Elan Change of Control Purchase Notice") to be sent by first-class mail, postage prepaid, to Elan stating:

(i) that the Elan Change of Control Purchase is being made pursuant to this paragraph 5;

(ii) the Elan Change of Control Purchase Price and the purchase date (which shall be a Business Day no earlier than 10 days nor later than 20 days from the date of the Elan Change of Control Purchase Notice (the "Elan Change of Control Payment Date"));

(iii) that the Elan Change of Control Purchase Price for any Security as to which the Elan Change of Control Purchase Notice relates will be paid on the Business Day following the later of (x) the Elan Change of Control Payment Date and (y) the date such Security is surrendered to the Company;

(iv) that Elan shall, and shall cause its Affiliates to, surrender to the Company on or prior to the Elan Change of Control Payment Date all Securities owned by any of them on the date of the Change of Control of Elan and the procedures to be followed in so surrendering such Securities; and

(v) that, unless the Company defaults in the payment of the Elan Change of Control Purchase Price, original Issue Discount on all such Securities or interest, if any, will cease to accrue on and after the Elan Change of Control Payment Date and, effective upon the date of the

Change of Control of Elan, such Securities shall cease to be convertible.

(c) In the event that the Company fails to deliver the Elan Change of Control Purchase Notice on or prior to the 10th day following receipt of an Elan Change of Control Notice pursuant to paragraph 5(b) hereof, such failure shall be deemed to be a waiver by the Company of its right to repurchase the Securities pursuant to this paragraph 5.

(d) Upon the giving of the Elan Change of Control Purchase Notice pursuant to this paragraph 5, such notice may not be revoked by the Company and all Securities as to which such Elan Change of Control Purchase Notice relates shall become due and payable in accordance with this paragraph 5 at the Elan Change of Control Purchase Price.

(e) Receipt of such Securities by the Company prior to, on or after the Elan Change of Control Payment Date shall be a condition to the receipt by the Holder of the Elan Change of Control Purchase Price therefor.

6. CONVERSION

(a) A Holder of a Security may, on or prior to November 9, 2008, convert in whole at any time or in part from time to time such Security into Common Stock; provided, however, that if a Security is called for redemption, the Holder may convert it at any time before the Redemption Date. A Security

in respect of which the Holder has delivered a Purchase Notice or a Company Change of Control Purchase Notice exercising the option of such Holder to require the Company to purchase such Security may, notwithstanding such notice, convert the Security in accordance with this paragraph 6 until the close of business on the Payment Date or the Company Change of Control Payment Date, as the case may be. Upon the occurrence of a Change of Control of Elan, the Securities then held by Elan and its Affiliates may not be converted on or prior to the 10th day following the giving of an Elan Change of Control Notice; provided that, if an Elan Change of Control Purchase Notice is given by the Company pursuant to paragraph 5(b) hereof, the Securities may not be converted unless the Company defaults in the payment of the Elan Change of Control Purchase Price for all Securities as to which such Elan Change of Control Purchase Notice relates. Notwithstanding the foregoing, neither Elan nor any of its Affiliates may convert any Security held by it if, at the time of such conversion, Elan is in violation of Section 14(c) of the Purchase Agreement.

(b) This Security shall be convertible into a number shares of Common Stock equal to (x) the Issue Price plus all accrued Original Issue Discount to the applicable Conversion Date (as defined below) (provided that if, prior to the applicable Conversion Date, the Securities have been converted to a semiannual coupon note following the occurrence of a Tax Event, this clause (x) shall be the Restated Principal Amount plus interest accrued and unpaid from, and including, the date of such conversion to, but excluding, such Conversion Date) provided by (y) $14.00, as adjusted to the Conversion Date (the "Conversion Price"). Provisions of this Security that apply to conversion of all of a Security also apply to conversion of a portion of such Security.

(c) The shares of Common Stock issuable upon conversion of this Security shall, to the extent required, bear the following legends:

> THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), AND MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT UNDER THE ACT OR PURSUANT TO A VALID EXEMPTION THEREFROM. THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE

DISPOSED OF EXCEPT IN ACCORDANCE WITH THE PROVISIONS OF REGULATION S (SECTION 230.901 THROUGH SECTION 230.905, AND PRELIMINARY NOTES). HEDGING TRANSACTIONS INVOLVING THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE CONDUCTED UNLESS IN COMPLIANCE WITH THE ACT.

THE TRANSFER OF THE SHARES REPRESENTED BY THIS CERTIFICATE IS SUBJECT TO THE CONDITIONS SPECIFIED IN A SECURITIES PURCHASE AGREEMENT, DATED AS OF NOVEMBER 6, 1998, BY AND AMONG THE COMPANY, ELAN INTERNATIONAL SERVICES, LTD. AND ELAN CORPORATION, PLC, AND THE COMPANY RESERVES THE RIGHT TO REFUSE THE TRANSFER OF SUCH SHARES UNTIL SUCH CONDITIONS HAVE BEEN FULFILLED WITH RESPECT TO SUCH TRANSFER. A COPY OF SUCH CONDITIONS WILL BE FURNISHED BY THE COMPANY TO THE HOLDER HEREOF WITHOUT CHARGE.

(d) To convert this Security a Holder must (i) complete and duly sign a conversion notice in the form attached hereto as Annex B (the "Conversion Notice") and deliver such notice to the Company and (ii) surrender this Security to the Company. The date on which a Holder of Securities satisfies all the foregoing requirements is the conversion date (the "Conversion Date"). Not more than three Business Days after the Conversion Date, the Company shall deliver to the Holder a certificate for the number of full shares of Common Stock issuable upon such conversion and cash in lieu of any fractional share. The Person in whose name the certificate is registered shall be treated as a stockholder of record on and after the Conversion Date; provided, however, that no surrender of a Security on any date when the stock transfer books of the Company shall be closed shall be effective to constitute the Person or Persons entitled to receive the shares of Common Stock upon such conversion as the record holder or holders of such shares of Common Stock on such date, but such surrender shall be effective to constitute the Person or Persons entitled to receive such shares of Common Stock as the record holder or holders thereof for all purposes at the close of business on the next succeeding day on which such stock transfer books are open; such conversion shall be at the Conversion Price in effect on the date that such Security shall have been surrendered for conversion, as if the stock transfer books of the Company had not been closed. Upon conversion of a Security, such Person shall no

longer be a Holder of such Security. Any Security for which a Conversion Notice is delivered on any Business Day shall be deemed to be converted simultaneously with all other Securities for which a Conversion Notice is delivered on such Business Day, subject to the surrender of such Securities to the Company pursuant to this paragraph 6.

(e) if a Holder converts more than one Security at the same time, the number of shares of Common Stock issuable upon such conversion shall be based on the sum of (x) the aggregate Issue Price plus (y) the aggregate accrued Original Issue Discount, in each case, of the Securities converted; provided that if, prior to the applicable Conversion Date, the Securities have been converted to a semiannual coupon note following the occurrence of a Tax Event, such conversion shall be based on the sum of (x) the aggregate Restated Principal Amount plus (y) the aggregate interest accrued and unpaid from, and including, the date of such conversion to, but excluding, such Conversion Date. Upon surrender of a Security that is converted in part, the Company shall execute and deliver to the Holder a new Security in a denomination equal in Principal Amount to the unconverted portion of the Security surrendered. If the last day on which a Security may be converted is not a Business Day, such Security may be surrendered to the Company on the next succeeding Business Day.

(f) The Company shall not issue a fractional share of Common Stock upon conversion of a Security. Instead, the Company shall deliver cash in an amount equal to the current market value of the fractional share. The current market value of a fraction of a share shall be determined to the nearest 1/10,000th of a share by multiplying the average of the Closing Prices of the Common Stock for the 20 consecutive trading days immediately prior to the applicable Conversion Date by such fraction and rounding to the nearest whole cent, with one-half cent being rounded upward.

(g) If a Holder converts a Security, the Company shall pay any documentary, stamp or similar issue or transfer tax due on the issue of shares of Common Stock upon such conversion.

(h) The Company shall reserve out of its authorized but unissued Common Stock a sufficient number of shares of Common Stock to permit the conversion of the Securities. All shares of Common Stock delivered upon conversion of the Securities shall be newly issued shares or treasury shares, shall be validly issued, nonassessable and fully paid, shall not be issued in violation of any preemptive or similar rights and shall be

free of any liens, encumbrances or restrictions on transfer imposed by the Company other than those imposed by the Securities Act and applicable state securities or "Blue Sky" laws. The Company shall cause all such reserved shares of Common Stock to be listed on the Nasdaq National Market or any other United States securities exchange or market where the Common Stock is principally traded.

(i) The Conversion Price shall be adjusted from time to time by the Company as follows:

(i) In case the Company shall, at any time or from time to time on or after the Issue Date, (A) pay a dividend or make a distribution on its Common Stock in shares of Common Stock, (B) subdivide its outstanding Common Stock into a greater number of shares, (B) combine its outstanding Common Stock into a smaller number of shares or (D) issue by reclassification of its Common Stock any other shares of its Capital Stock, then, in each such case, the Conversion Price in effect immediately prior to such action shall be adjusted so that the Holder of any Security thereafter surrendered for conversion shall be entitled to receive the number of shares of Common Stock or other Capital Stock of the Company which such Holder would have owned or have been entitled to receive after the happening of any of the events described above had such Security been converted immediately prior to the happening of such event. If any dividend or distribution of the type described in clause (A) above is not so paid or made, the Conversion Price shall again be adjusted to the Conversion Price which would then be in effect if such dividend or distribution had not been declared. An adjustment made pursuant to this paragraph 6(i)(i) shall become effective immediately after the record date in the case of a dividend or distribution and shall become effective immediately after the effective date in the case of subdivision, combination or reclassification. If, after an adjustment made pursuant to this paragraph 6(i)(i), the Holder of any Security thereafter converted shall become entitled to receive shares of two or more classes of Capital Stock of the Company, the board of directors of the Company shall determine the allocation of the adjusted Conversion Price between or among such classes of Capital Stock, which determination shall be final and binding on all Holders. After such allocation, the Conversion Price of each class of Capital Stock of the Company shall thereafter be subject to adjustment on terms comparable to those applicable to Common Stock in this paragraph 6(i).

(ii) If, at any time or from time to time on or after the Issue Date, the Company issues or sells any Common Stock for consideration in an amount per share less than the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to such issuance or sale, the Conversion Price shall be adjusted in accordance with the following formula:

$$E' = E \times \frac{O + M}{P}$$

A

where:

E' = the adjusted Conversion Price.

E = the then current Conversion Price.

O = the number of shares of Common stock outstanding immediately prior to the issuance or sale of such additional shares of Common Stock.

P = the aggregate consideration received for the issuance or sale of such additional shares of Common Stock.

M = the average Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to the date of the issuance or sale of such additional shares of Common Stock.

A = the number of shares of Common Stock outstanding immediately after the issuance or sale of such additional shares of Common Stock.

The adjustments shall be made successively whenever any such issuance or sale is made, and shall become effective immediately after such issuance or sale.

This paragraph 6(i)(ii) does not apply to:

(A) the issuance of the License Shares pursuant to and in accordance with the License Agreement and the Purchase Agreement;

(B) the conversion of the Securities or the conversion, exercise or exchange of any other securities convertible into, or exercisable or exchangeable for, Common Stock;

(C) the issuance of Common Stock pursuant to a valid and binding written agreement with any Person, the terms of which provide that such Common Stock is to be issued on a date after the execution of such agreement and upon the occurrence of specified events (other than solely the passage of time);

(D) the issuance Common Stock to the shareholders of any Person which mergers into the Company or any Subsidiary of the Company in proportion to such shareholders' ownership of the securities of such Person, upon such merger; or

(E) Common Stock issued in a bona fide public offering pursuant to a firm commitment or "best efforts" underwriting.

(iii) If, at any time or from time to time on or after the Issue Date, the Company shall issue rights, options or warrants to all holders of its Common Stock entitling them (for a period expiring within 60 days after the record date mentioned below) to subscribe for or purchase shares of Common Stock at a Price per share less than the greater of (x) the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to the record date and (y) the then current Conversion Price, the Conversion Price shall be adjusted in accordance with the following formula:

N x P

$$E' = \frac{E \times O + M}{O + N}$$

where:

E' = the adjusted Conversion Price.

E = the then current Conversion Price.

O = the number of shares of Common Stock outstanding on the record date fixed for determination of

stockholders entitled to participate in such issuance.

N = the number of additional shares of Common Stock offered pursuant to such issuance.

P = the offering price per share of such additional shares of Common Stock.

M = the greater of (x) the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to the record date and (y) the then current Conversion Price.

The adjustment shall be made successively whenever any such issuance is made and shall become effective immediately after the record date fixed for the determination of stockholders entitled to participate in such issuance.

To the extent that shares of Common Stock are not delivered after the expiration of such rights, options or warrants, the Conversion Price shall be readjusted to the Conversion Price which would then be in effect had the adjustments made upon the issuance of such rights, options or warrants been made on the basis of delivery of only the number of shares of Common Stock actually delivered. If such rights, options or warrants are not so issued, the Conversion Price shall again be adjusted to be the Conversion Price which would then be in effect if the record date for the determination of stockholders entitled to participate in such distribution had not been fixed. In determining whether any rights, options or warrants entitle the Holders to subscribe for or purchase shares of Common Stock at a price per share less than the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately preceding the record date, and in determining the aggregate offering price of such shares of Common Stock, there shall be taken into account any consideration received by the Company for such rights, options or warrants, the value of such consideration, if other than cash, to be determined in good faith by the board of directors of the Company (irrespective of the accounting treatment thereof), which determination shall be final and binding on all Holders. Such determination shall be described in a board resolution. Notwithstanding the foregoing provisions of this paragraph 6(i)(iii), an

event which would otherwise give rise to an adjustment under this paragraph 6(i)(iii) shall not give rise to such an adjustment if the

Company includes the Holders in such distribution on a pro rata basis as if each such Holder held the number of shares of Common Stock into which such Holder's Securities are convertible on the record date fixed for determination of the stockholders entitled to participate in such distribution and with the same notice as is provided to such stockholders.

This paragraph 6(i)(iii) does not apply to transactions described in paragraph 6(i)(iv).

(iv) If, at any time or from time to time on or after the Issue Date, the Company shall, by dividend or otherwise, distribute to all holders of its Common Stock any class of Capital Stock of the Company (other than Common Stock) or evidences of its indebtedness or assets (excluding cash dividends or other cash distributions from current or retained earnings other than any Extraordinary Cash Dividend) or rights, options or warrants to subscribe for or purchase any of the foregoing, the Conversion Price shall be adjusted in accordance with the following formula:

$$E' = \frac{E \times M - F}{M}$$

where

E' = the adjusted Conversion Price.

E = the then current Conversion Price.

M = the greater of (x) the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to the record date mentioned below and (y) the then current Conversion Price.

F = the fair market value on the record date fixed for determination of the stockholders entitled to participate in such distribution of the assets, securities, rights, options or warrants applicable to one share of Common stock. The board of directors shall determine such fair market value in good faith (irrespective of the

accounting treatment thereof), which determination shall be final and binding on the Holders. Such determination shall be described in a board resolution.

The adjustment shall be made successively whenever any such distribution is made and shall become effective immediately after the record date fixed for the determination of stockholders entitled to receive such distribution. To the extent that shares of Common Stock are not so delivered after the expiration of such rights, options, or warrants, the Conversion Price shall be readjusted to the Conversion Price which would then be in effect had the adjustment made upon the issuance of such rights, options or warrants been made on the basis of the delivery of only the number of shares of Common Stock actually delivered. Notwithstanding the foregoing provisions of this paragraph 6(i)(iv), an event which would otherwise give rise to an adjustment under this paragraph 6(i)(iv) shall not give rise to such an adjustment if the Company includes the Holders in such distribution on a pro rata basis as if each such Holder held the number of shares of Common Stock into which such Holder's Securities are convertible on the record date fixed for determination of the stockholders entitled to participate in such distribution and with the same notice as is provided to such stockholders.

This paragraph 6(i)(iv) does not apply to any transaction described in paragraph 6(i)(iii) hereof.

(v) If, at any time or from time to time on or after the Issue Date, the Company shall (x) enter into any valid and binding written agreement with any Person to issue or sell Common Stock on a date after the execution of such agreement and upon the occurrence of specified events (other than solely the passage of time) or (y) issue or sell any securities convertible into, or exercisable or exchangeable for, Common Stock, in each case, for consideration per share of Common Stock less than the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to, in the case of clause (x), the date of execution of such agreement, and, in the case of clause (y), the date of such issuance or sale, the Conversion Price shall be adjusted in accordance with the following formula:

$$E' = E \times \frac{O + \frac{P}{M}}{O + D}$$

where:

E' = the adjusted Conversion Price.

E = the then current Conversion Price.

O = the number of shares of Common Stock outstanding immediately prior to, in the case of clause (x) above, the date of execution of such agreement, and, in the case of clause (y) above, the issuance or sale of such securities.

P = (a) in the case of clause (x) above, the minimum aggregate amount of consideration payable to the Company upon the issuance or sale of such Common Stock (including the minimum aggregate amount of cash payments to be made by the Company to the other Person or Persons party to such agreement in lieu of which such Common Stock may be issued) and (b) in the case of clause (y) above, the aggregate consideration received for the issuance or sale of such securities plus the minimum aggregate amount of additional consideration, other than the surrender of such securities, payable to the Company upon conversion, exercise or exchange of such securities.

M = the Closing Prices of the Common stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to, in the case of clause (x) above, the date of execution of such agreement, and, in the case of clause (y) above, the date of such issuance or sale.

D = the maximum stated number of shares deliverable pursuant to such agreement or upon conversion, exercise or exchange of such securities, as the case may be.

The adjustment shall be made successively whenever any such agreement is executed or such issuance or sale is made, and shall become effective immediately after the execution of such agreement or such issuance or sale.

If all of the Common Stock deliverable pursuant to any such agreement or upon conversion, exercise or exchange of such securities have not been issued upon the expiration or termination of such agreement or when such securities are no longer outstanding, as the case may be, then the Conversion Price shall be readjusted to the Conversion Price which would then be in effect had the adjustment made upon the execution of such agreement or the issuance or sale of such securities been made on the basis of the actual number of shares of Common Stock issued pursuant to such agreement or upon conversion, exercise or exchange of such securities.

This paragraph 6(i)(v) does not apply to:

(A) any stock options issued to employees and consultants (other than officers or directors) of the Company pursuant to any employee stock option or purchase plan or program approved by the board of directors of the Company;

(B) the issuance of the Securities; or

(C) any transaction described in paragraph 6 (i) (iii) or (iv).

In the event of any change in the number of shares of Common Stock deliverable, or in the consideration payable to the Company, pursuant to any such agreement or upon the conversion, exercise or exchange of such securities, including, but not limited to, a change resulting from any anti-dilution provisions thereof, the Conversion Price shall, on the date of such change, be recomputed to reflect such change.

(vi) For purposes of any computation respecting consideration received pursuant to paragraph 6(i)(ii) and (v) hereof, the following shall apply:

(A) in the case of the issuance or sale of shares of Common Stock for cash, the consideration shall be the amount of such cash; provided that in no event shall any deduction be made for any commissions, discounts or other expenses incurred by the Company in connection therewith;

(B) in the case of the issuance or sale of shares of Common Stock for a consideration in whole or in part other than cash, the consideration other than cash shall be deemed to be the fair market value thereof as determined in good faith by the board of directors of the Company (irrespective of the accounting treatment thereof), which determination shall be final and binding on the Holders. Such determination shall be described in a board resolution; and

(C) in the case of any agreement referred to in clause (x) of paragraph 6(i)(v) hereof or the issuance or sale of securities referred to in clause (y) of paragraph 6(i)(v) hereof, the consideration, if any, to be received by the Company for the issuance or sale of Common Stock pursuant to such agreement or upon the conversion, exercise or exchange of such securities shall determined in the same manner as provided in clauses (A) and (B) of this paragraph 6(i)(vi).

(vii) No adjustment in the Conversion Price need be made unless the adjustment would require a decrease of at least 1% in the Conversion Price then in effect; provided that any adjustment that would otherwise be required to be made shall be carried forward and taken into account

in any subsequent adjustment. All calculations under this paragraph 6(i) shall be made to the nearest cent or to the nearest 1/10,000th of a share, as the case may be.

(viii) No adjustment need be made for rights to purchase Common Stock pursuant to a Company plan for reinvestment of dividends or interest. No adjustment need be made for a change in the par value or no par value of the Common Stock. To the extent that the Securities become convertible into cash, no adjustment need be made thereafter as to the amount of cash into which such Securities are convertible. Neither Original Issue Discount nor interest will accrue on cash.

(ix) Whenever the Conversion Price is adjusted, the Company shall promptly mail to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, a notice of the adjustment.

(x) In case:

(A) the Company shall take any action that would require an adjustment in the Conversion Price pursuant to paragraph 6(i)(i), (ii), (iii), (iv) or (v) hereof;

(B) of any event described in paragraph 6(i)(xi) hereof; or

(C) of the voluntary or involuntary dissolution, liquidation or winding-up of the Company;

the Company shall cause to be mailed to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, as promptly as possible but in any event at least 15 days prior to the applicable date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of any dividend or distribution or (y) the date on which any reclassification, consolidation, merger, sale, transfer, dissolution, liquidation or winding-up is expected to become effective or occur. Failure to give such notice, or any defect therein, shall not affect the legality or validity of such dividend, distribution, reclassification, consolidation, merger, sale, transfer, dissolution, liquidation or winding-up.

(xi) In the event of: (a) any reclassification or change of outstanding shares of Common Stock (other than a change in par value, or from par value to no par value, or from no par value to par value, or as a result of a subdivision or combination), (b) any consolidation or amalgamation with, or merger with or into, another Person as a result of which holders of Common Stock shall be entitled to receive cash, securities or other property with respect to or in exchange for such Common Stock or (c) any sale, transfer, assignment, lease, conveyance or other disposition of all or substantially all of the assets of the Company (in one transaction or series of related transactions) to any other Person as a result of which holders of Common Stock shall be entitled to receive cash, securities or other property with respect to or in exchange for such Common Stock, then the Company or the Person (if other than the Company) formed by such consolidation or amalgamation or into which the Company is merged or to which the properties and assets are sold, assigned, transferred, leased, conveyed or otherwise disposed of, as the case may be, shall expressly agree in writing, in form and substance satisfactory to a majority of Holders of Securities

then outstanding (excluding Securities then held by the Company or any of its Affiliates), that each Security shall be convertible into the kind and amount of securities, cash or other assets which the Holder of such Security would have owned immediately after such reclassification, change, consolidation, amalgamation, merger, sale, transfer, assignment, lease, conveyance or other disposition if such Holder had exercised such Security immediately before the record date or effective date, as the case may be, of the transaction. Such written agreement shall provide for adjustments which shall be as nearly equivalent as may be practicable to the adjustments provided for in this paragraph 6(i).

The Company shall cause notice of the execution of such written agreement to be mailed to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, within 20 days after execution thereof. Failure to deliver such notice shall not affect the legality or validity of such agreement.

The above provisions of this paragraph 7(i)(xi) shall similarly apply to successive reclassifications, changes, consolidations, amalgamations, mergers, sales, transfers, assignments, leases, conveyances or other dispositions.

If this paragraph 6(i)(ix) applies to any event or occurrence, paragraph 6(i)(i), (ii), (iii), (iv) and (v) hereof shall not apply.

(xii) Rights or warrants distributed by the Company to all holders of Common Stock entitling the holders thereof to subscribe for or purchase shares of the Company's Capital Stock (either initially or under certain circumstances), which rights or warrants, until the occurrence of a specified event or events (each, a "Trigger Event"): (i) are deemed to be transferred with such shares of Common Stock, (ii) are not exercisable and (iii) are also issued in respect of future issuances of Common Stock, shall be deemed not to have been distributed for purposes of this paragraph 6(i) (and no adjustment to the Conversion Price under this paragraph 6(i) will be required) until the occurrence of the earliest Trigger Event, whereupon such rights and warrants shall be deemed to have been distributed and an appropriate adjustment (if any is required) to the Conversion Price shall be made under this paragraph 6(i). If any such right or warrant, including

any such existing rights or warrants distributed prior to the Issue Date, are subject to events, upon the occurrence of which such rights or warrants become exercisable to purchase different securities, evidences of indebtedness or other assets, then the date of the occurrence of any and each such event shall be deemed to be the date of distribution with respect to new rights or warrants with such rights (and a termination or expiration of the existing rights or warrants without exercise by any of the holders thereof). In addition, in the event of any distribution (or deemed distribution) of rights or warrants, or any Trigger Event or other event (of the type described in the preceding sentence) with respect thereto that was counted for purposes of calculating a distribution amount for which an adjustment to the Conversion Price under this paragraph 6(i) was made, (A) in the case of any such rights or warrants which shall have been redeemed or repurchased without exercise by any holders thereof, the Conversion Price shall be readjusted upon such final redemption or repurchase to give effect to such distribution or Trigger Event, as the case may be, as though it were a cash distribution, equal to the per share redemption or repurchase price received by a holder or holders of Common Stock with respect to such rights or warrants (assuming such holder had retained such rights or warrants), made to all holders of Common Stock as of the date of such redemption or repurchase and (B) in the case of such rights or warrants which shall have expired or been terminated without exercise by any holders thereof, the Conversion Price shall be readjusted as if

such rights and warrants had not been issued. Notwithstanding the foregoing, no Holder shall be entitled to any adjustment in the Conversion Price of the Notes held by such Holder pursuant to this paragraph 6(i) if the applicable Trigger Event shall have been caused by the acquisition of securities of the Company by such Holder or any of its Affiliates.

(j) After an adjustment to the Conversion Price under paragraph 6(i), (ii), (iii), (iv) or (v) hereof, any subsequent event requiring an adjustment shall cause an adjustment to the Conversion Price as so adjusted.

(k) No adjustment shall be made pursuant to paragraph 6(i)(i), (ii), (iii), (iv) or (v) hereof if, as a result thereof, the Conversion Price would be increased.

7. COVENANTS

(a) Payment of Securities. The Company shall promptly make all payments in respect of the Securities on the dates and in the manner provided herein.

The Company shall, to the extent permitted by law, pay interest on overdue amounts at the rate set forth in paragraph 1 of the Securities, which interest on overdue amounts (to the extent that the payment of such interest shall be legally enforceable) shall accrue from the date such amounts became overdue.

(b) SEC Reports. The Company shall deliver to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, at the time the Company distributes them to the holders of its Common Stock, copies of its annual reports to shareholders and its proxy statements. In addition, the Company shall deliver to Elan, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, within 30 days after the Company files them with the SEC, copies of all other information, documents and reports (or copies of such portions of any of the foregoing as the SEC may by rules and regulations prescribe) which the Company is required to file with the SEC pursuant to Section 13 or 15(d) of the Exchange Act (or any successor provision thereof). In the event that the Company is at any time no longer subject to the reporting requirements of the Exchange Act (or any such successor provision), it shall deliver to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, reports containing substantially the same information as would have been required to be filed with the SEC had the Company continued to have been subject to such reporting requirements, including, with respect to annual information only, a report thereon by the Company's certified independent public accountants as such would be required in such reports to the SEC and, in each case, together with a management's discussion and analysis of financial condition and results of operations as such would be so required. In such event, such reports shall be so delivered at the time the Company would have been required to provide such reports had it continued to have been subject to such reporting requirements.

(c) Compliance Certificates; Notice of defaults.

(i) The Company shall deliver to each Holder, within 90 days after the end of each fiscal year, an Officers'

Certificate stating that a review of the activities of the Company and its Subsidiaries during such fiscal year has been made under the supervision of the signing Officers with a view to determining whether the Company has kept, observed, performed and fulfilled its obligations under the Securities, and further stating, as to each such Officer signing such certificate, that to the best of his or her knowledge, the Company has kept, observed, performed and fulfilled each and every covenant contained in the Securities and is not in default in the performance or observance of any of the terms, provisions and conditions contained in the Securities (or, if a Default or Event of Default shall have occurred, describing all such Defaults or Events of Default of which he or she may have knowledge and what action the Company is taking or proposes to take with respect thereto).

(ii) The Company shall, so long as any of the Securities are outstanding, deliver to each Holder, forthwith upon any officer becoming aware of any Default or Event of Default, an Officers' Certificate specifying such Default or Event of Default and what action the Company is taking or proposes to take with respect thereto.

(d) Further Instruments and Acts. Upon request of the Holders of at least a majority in the aggregate Principal Amount of the outstanding Securities (excluding Securities at the time owed by the Company and its Affiliates), the Company will execute and deliver such further instruments and do such further acts as may be reasonably necessary or proper to carry out more effectively the provisions of the Securities.

(e) Taxes. The Company shall, and shall cause each of its Subsidiaries to, pay prior to delinquency all material taxes, assessments and governmental levies, except as contested in good faith and by appropriate proceedings.

(f) Legal Existence. Subject to paragraph 8 hereof, the Company shall do or cause to be done all things necessary to preserve and keep in full force and effect its legal existence, and the corporate, partnership or other existence of each of its Subsidiaries, in accordance with their respective organizational documents (as the same may be amended from time to time) and the rights (charter and statutory), licenses and franchises of the Company and its Subsidiaries; provided that the Company shall not be required to preserve any such right, license or franchise, or the corporate, partnership or other existence of any of its Subsidiaries if the board of directors of the Com-

pany shall determine that the preservation thereof is no longer desirable in the conduct of the business of the Company and its Subsidiaries, taken as a whole.

(g) Withholding Taxes. All transfers of Securities by the Holders thereof and all payments made by the Company under or with respect to the Securities (including the issuance of securities upon the conversion of the Securities) shall be made free and clear of and without withholding or deduction for or on account of any present or future Taxes, unless the Company is required to withhold or deduct Taxes by law or by the interpretation or administration thereof. If the Company is required by law or by the interpretation or administration thereof to withhold or deduct any amount of Taxes in connection with the Securities, such amount shall be withheld and deducted by the Company without alteration of or increase in its obligations under the Securities; provided, however, that, if the Holder thereof has delivered to the Company a complete, manually-signed copy of Internal Revenue Service Form 1001 (or any successor form) or Internal Revenue Service Form 4224 (or any successor form) properly certifying to such Holder's entitlement to a complete exemption from U.S. withholding Tax with respect to such payment under applicable United States Treasury Regulations, such payment shall be made free and clear of and without withholding or deduction for or on account of any Taxes. In connection with any payment made by the Company under any Security which is made in whole or in part through the delivery of shares of Common Stock of the Company (including upon the conversion of the Securities), the amount required to be withheld or deducted shall first be withheld or deducted from the amount of cash (up to the total amount thereof) which would otherwise be paid at such time. Any additional amount required to be withheld or deducted, unless otherwise agreed by the Company and the Holder of a Security, shall be withheld and deducted by reducing the number of shares of Common Stock to be delivered by that number of shares of Common Stock equal to the remaining amount required to be withheld or deducted divided by the Conversion Price in effect on the date of such payment.

(h) Line of Business. The Company and its Subsidiaries will not engage in any businesses other than the business of researching, developing, marketing, selling, manufacturing, distributing or licensing pharmaceutical, medical, biologic, genetic or related products and services and financing activities related solely thereto, including the businesses in which the Company and its Subsidiaries are engaged on the Issue Date.

(i) Use of Proceeds. The Company will use the gross proceeds from the issuance of any Additional Notes in accordance with Section 1(b) of the Purchase

Agreement and otherwise in accordance with the Purchase Request related thereto.

(j) Maintenance of Properties; Insurance; Books and Records; Compliance with Law.

(i) The Company shall, and shall cause each of its Subsidiaries to, at all times cause all material properties used or useful in the conduct of its business to be maintained and kept in good condition, repair and working order (reasonable wear and tear excepted) and supplied with all necessary equipment, and shall cause to be made all necessary repairs, renewals, replacements, betterments and improvements thereto; provided that, subject to the other provisions of the Securities, nothing in this paragraph 7(j)(i) shall prevent the Company or any of its Subsidiaries from selling, abandoning or otherwise disposing of any property (including any lease of property) if in the judgment of the Company the same is no longer useful in the business of the Company or such Subsidiary, as the case may be.

(ii) The Company shall maintain, and shall cause to be maintained for each of its Subsidiaries, insurance covering such risks as are usually and customarily insured against by corporations similarly situated, in such amounts as shall be customary for corporations similarly situated and with such deductibles and by such methods as shall be customary and reasonably consistent with past practice.

(iii) The Company shall, and shall cause each of its Subsidiaries to, keep proper books of record and account, in which full and correct entries shall be made of all financial transactions and the assets and business of the Company and each Subsidiary of the Company, in accordance with U.S. generally accepted accounting principles consistently applied to the Company and its Subsidiaries, taken as a whole.

(iv) The Company shall, and shall cause each of its Subsidiaries to, comply with all statutes, laws, ordinances or government rules and regulations to which they are subject, non-compliance with which would materially adversely affect the business, prospects, earnings, prop-

erties, assets or financial condition of the Company and its Subsidiaries, taken as a whole.

8. SUCCESSOR CORPORATION

(a) The Company shall not consolidate with, amalgamate with, merge with or into, or sell, assign, transfer, lease, convey or otherwise dispose of all or substantially all of its assets (as an entirety or substantially as an entirety in one transaction or a series of related transactions), to any Person unless:

(i)(x) the Company shall be the continuing Person, or (y) the Person (if other than the Company) formed by such consolidation or amalgamation or into which the Company is merged or to which the properties and assets of the Company are sold, assigned, transferred, leased, conveyed or otherwise disposed of (in any case, the "Successor Company") shall be a corporation organized and existing under the laws of the United States or any State thereof or the District of Columbia and the Successor Company shall expressly affirm, in writing, the due and punctual performance of all of the terms, covenants, agreements and conditions of the Securities to be performed or observed by the Company, and such obligations shall remain in full force and effect; and

(i) immediately before and immediately after giving effect to such transaction, no Default or Event of Default shall have occurred and be continuing.

(b) In connection with any consolidation, amalgamation, merger or sale, assignment, transfer, lease, conveyance or other disposition of assets contemplated by this paragraph 8, prior to the consummation of such transaction or transactions the Company shall deliver, or cause to be delivered, to each Holder, by first-class mail, postage prepaid, at its address appearing in the register maintained by the Company, an Opinion of Counsel stating that (i) such consolidation, amalgamation, merger or sale, assignment, transfer, lease, conveyance or other disposition of assets complies with this paragraph 8, (ii)

all conditions precedent herein provided for relating to such transaction or transactions have been complied with and (iii) the affirmation provided for in this paragraph 8 has been duly authorized, executed and delivered by the Successor Company and the Securities are valid and legally binding obligations of the Successor Company enforceable against it in accordance with their terms (subject to bankruptcy, insolvency, re-

organization and similar laws affecting the rights and remedies of creditors generally and general equitable principles).

(c) For purposes of paragraph 8(a) and (b) hereof, the transfer (by sale, assignment, lease, conveyance or other disposition, in a single transaction or series of related transactions) of all or substantially all of the properties or assets of one or more Subsidiaries of the Company, the Capital Stock of which constitutes all or substantially all of the properties and assets of the Company, shall be deemed to be the transfer of all or substantially all of the properties and assets of the Company.

(d) Upon any consolidation, amalgamation or merger, or any sale, assignment, transfer, lease, conveyance or other disposition of all or substantially all of the assets of the Company in accordance with this paragraph 8, the Successor Company shall succeed to, and be substituted for, and may exercise every right and power of, the Company under the Securities with the same effect as if such Successor Company had been named as the Company in the Securities, and thereafter the predecessor corporation shall be relieved of all obligations and covenants under the Securities.

9. DEFAULTS AND REMEDIES

(a) An "Event of Default" occurs if:

(i) after exercise of its option pursuant to paragraph 12 hereof following a Tax Event, the Company defaults in the payment of interest upon any Security or delivery of any Tax Event Option related thereto, when such interest becomes due and payable, and such default continues for a period of 30 days;

(ii) the Company defaults in the payment of the Principal Amount, Issue Price, accrued Original Issue Discount, Redemption Price, Purchase Price, Company Change of Control Purchase Price or Elan Change of Control Purchase Price on any Security when the same becomes due and payable at its Stated Maturity, upon redemption, upon declaration, when due for purchase by the Company or otherwise;

(iii) the Company defaults in the observance or performance of any agreement, covenant, term or condition contained in any Security (other than those referred to in clause (i) and (ii) above) and such failure continues for 30 days after receipt by the Company of notice thereof

(except in the case of a failure or default with respect to paragraph 8 hereof, which shall constitute an Event of Default with such notice requirement but without such passage of time requirement);

(iv) the Company defaults in any payment of principal of or interest on any other obligation for money borrowed or the Company fails to perform or observe any other agreement, covenant, term or condition contained in any agreement under which any such obligation is created and the effect of such default or failure is to cause, or the holder or holders of such obligation (or a trustee on behalf of such holder or holders), as a consequence of such default or failure shall take action to cause, such obligation to become due prior to any stated maturity thereof; provided that the aggregate amount of all obligations as to which such acceleration shall occur is equal to or greater than $4.0 million;

(v) any final judgment or judgments which can no longer be appealed for the payment of money in excess of $4.0 million (in excess of amounts covered by insurance and as to which the insurer has acknowledged coverage) shall be rendered against the Company or any Subsidiary thereof, and shall not be discharged for any period of 60 consecutive days during

which a stay of enforcement shall not be in effect;

(vi) the Company or any Subsidiary thereof pursuant to or within the meaning of any Bankruptcy Law:

(A) commences a voluntary case,

(B) consents to the entry of an order for relief against it in an involuntary case,

(C) consents to the appointment of a Custodian of it or for all or substantially all of its property,

(D) makes a general assignment for the benefit of its creditors, or

(E) generally is not paying its debts as they become due;

(vii) a court of competent jurisdiction enters an order or decree under any Bankruptcy Law that:

(A) is for relief against either of the Company or any Subsidiary thereof in an involuntary case,

(B) appoints a Custodian of either of the Company or any Subsidiary thereof or for all or substantially all of the property of either of the Company or any Subsidiary thereof, or

(C) orders the liquidation of either of the Company or any Subsidiary thereof,

and the order or decree remains unstayed and in effect for 60 days; or

(viii) the Company fails to deliver shares of Common Stock (or cash in lieu of fractional shares) when such Common Stock (or cash in lieu of fractional shares) is required to be delivered, upon conversion of a Security and such failure is not remedied for a period of 10 days.

(b) If an Event of Default (other than an Event of Default specified in paragraph 9(a)(vi) or (vii) hereof occurs and is continuing, the Holders of at least 25% in aggregate Principal Amount of the Securities at the time outstanding (excluding Securities at the time owned by the Company and its Affiliates) by notice to the Company, may declare the Issue Price and accrued Original Issue Discount (or, if the Securities have been converted to a semiannual coupon note following a Tax Event, the Restated Principal Amount and accrued and unpaid interest) through the date of declaration on all the Securities to be immediately due and payable. Upon such a declaration, such Issue Price and accrued Original Issue Discount (or, if the Securities have been converted to a semiannual coupon note following a Tax Event, the Restated Principal Amount and accrued and unpaid interest) shall become and be due and payable immediately. If an Event of Default specified in paragraph 9(a)(vi) or (vii) hereof occurs and is continuing, the Issue Price and accrued Original Issue Discount (or, if the Securities have been converted to a semiannual coupon note following a Tax Event, the Restated Principal Amount and accrued and unpaid interest) on all the Securities shall become and be immediately due and payable without any declaration or other act on the part of any Holders. The Holders of a majority in aggregate Principal Amount of the Securities at the time outstanding (excluding Securities at the time owned by the Company (and its Affiliates), by notice to the Company (and without notice to any other Holder), may rescind an acceleration and its consequences if the rescission would not conflict with any

judgment or decree and if all existing Events of Default have been cured or waived except nonpayment of the Issue Price and accrued Original Issue Discount (or accrued and unpaid interest) that have become due solely as a result of acceleration. No such rescission shall affect any subsequent or other Default or Event of Default or impair any consequent right.

(c) If an Event of Default occurs and is continuing, any Holder may pursue any available remedy to collect the payment of the Issue Price and accrued Original Issue Discount (or, if the Securities have been converted to a semiannual coupon note following a Tax Event, the Restated Principal Amount and accrued and unpaid interest) on the Securities or to enforce the performance of any provision of the Securities.

A delay or omission by any Holder in exercising any right or remedy accruing upon an Event of Default shall not impair the right or remedy or constitute a waiver of, or acquiescence in, the Event of Default. No remedy is exclusive of any other remedy. All available remedies are cumulative.

(d) The Holders of a majority in aggregate Principal Amount of the Securities at the time outstanding (excluding Securities at the time owned by the Company and its Affiliates), by notice to the Company (and without notice to any other Holder), may waive an existing Default or Event of Default and its consequences except (i) an Event of Default described in paragraph 9(a)(i), (ii) or (viii) hereof or (ii) a Default in respect of a provision that under paragraph 11 hereof cannot be amended without the consent of each Holder affected. When a Default or Event of Default is waived, it is deemed cured, but no such waiver shall extend to any subsequent or other Default or Event of Default or impair any consequent right.

(e) Notwithstanding any other provision of the Securities, the right of any Holder to receive payment of the Principal Amount, Issue Price, accrued Original Issue Discount, Redemption Price, Purchase Price, Company Change of Control Purchase Price, Elan Change of Control Purchase Price or interest, if any, in respect of the Securities held by such Holder, on or after the respective due dates expressed in the Securities and to convert the Securities in accordance with paragraph 6 hereof, or to bring suit for the enforcement of any such payment on or after such respective dates or the right to convert the Securities, shall not be impaired or affected adversely without the consent of each such Holder.

(f) The Company covenants (to the extent it may lawfully do so) that it will not at any time insist upon, or plead, or in any manner whatsoever claim or take the benefit or advantage of, any stay or extension law or any usury or other law wherever enacted, now or at any time hereafter in force, which would prohibit or forgive the Company from paying all or any portion of the Principal Amount, Issue Price plus accrued Original Issue Discount, Redemption Price, Purchase Price, Company Change of Control Purchase Price or Elan Change of Control Purchase Price, in each case, in respect of Securities, or any interest on such amounts, as contemplated herein, or which may affect the covenants or the performance of the Securities; and the Company (to the extent it may lawfully do so) hereby expressly waives all benefit or advantage of any such law, and covenants that it will not hinder, delay or impede the execution of any power herein granted to the Holders, but will suffer and permit the execution of every power as though no such law had been enacted.

10. REGISTRATION, REGISTRATION OF TRANSFER AND EXCHANGE

(a) The Company shall cause to be kept at its offices a register in which the Company shall provide for the registration of Securities and of transfers of Securities. Upon surrender for registration of transfer of any Security, the Company shall execute, in the name of the designated transferee or transferees, one or more Securities of a like aggregate Principal Amount and bearing such restrictive legends as may be required by the terms of the Securities.

At the option of the Holder, and subject to the other provisions of the Securities, Securities may be exchanged for other Securities of a like aggregate Principal Amount, upon surrender of the Securities to be exchanged to the Company. Whenever any Securities are so surrendered for exchange, and subject to the other provisions of the Securities, the Company shall execute and deliver the Securities which the Holder making the exchange is entitled to receive. Every Security presented for registration of transfer or exchange shall be accompanied by the written instrument of transfer in the form attached hereto as Annex C, duly executed by the Holder thereof.

All Securities issued upon any registration of transfer or exchange of

Securities shall be the valid obligations of the Company, evidencing the same debt, and subject to the same provisions as the Securities surrendered upon such registration of transfer or exchange.

Subject to paragraph 7(g) hereof and notwithstanding any other provision of this Section 10(a), no transfer of any Security shall be permitted, and no registration of transfer shall be effected unless, prior to the time of such transfer or registration of transfer, the Holder has made arrangements reasonably satisfactory to the Company for payment or reimbursement of any and all Taxes which would, in the absence of payment by the transferor, be required to be paid by the Company as a result of such transfer. No service charge shall be made for any registration of transfer or exchange. The Company acknowledges that Treasury Regulation Section 1.441-2(b)(3) (effective January 1, 1999) is not applicable to any Security issued prior to January 1, 1999.

In the event of a redemption of the Securities, the Company will not be required (i) to register the transfer of or exchange Securities for a period of 5 days immediately preceding the date notice of any redemption is given pursuant to paragraph 3(e) hereof or (ii) to register the transfer of or exchange any Security, or portion thereof, called for redemption.

(b) Except as permitted by this paragraph (b), each Security (and all Securities issued in exchange therefor or substitution thereof) shall, so long as appropriate, bear a legend (the "Legend") to substantially the following effect (each, a "Transferred Restricted Security"):

> THE SECURITY EVIDENCED HEREBY HAS NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT UNDER THE ACT OR PURSUANT TO A VALID EXEMPTION THEREFROM.
>
> THE TRANSFER OF THE SECURITY EVIDENCED HEREBY IS SUBJECT TO THE CONDITIONS SPECIFIED IN A SECURITIES PURCHASE AGREEMENT, DATED AS OF NOVEMBER 6, 1998, BY AND AMONG THE COMPANY, ELAN INTERNATIONAL SERVICES, LTD. AND ELAN CORPORATION, PLC, AND THE COMPANY RESERVES THE RIGHT TO REFUSE THE TRANSFER OF SUCH SECURITY UNTIL SUCH CONDITIONS HAVE BEEN FULFILLED WITH RESPECT TO SUCH TRANSFER. A COPY OF SUCH CONDITIONS WILL BE FURNISHED BY THE COMPANY TO THE HOLDER HEREOF WITHOUT CHARGE.

At such time as any Transfer Restricted Security may be freely transferred without registration under the Securities Act and without being subject to transfer restrictions pursuant to the Securities Act, the Company shall permit the Holder of such Transfer Restricted Security to exchange such Transfer Restricted Security for a new Security which does not bear the applicable portion of the Legend upon receipt of certification from such Holder substantially in the form attached hereto as Annex D and, at the request of the Company, upon receipt of an opinion of counsel addressed to the Company that the transfer restrictions contained in the Legend are no longer applicable. In addition, at such time as such Security is no longer subject to the transfer conditions set forth in the Purchase Agreement, the Company shall permit the Holder of such Security to exchange such Security for a new Security which does not bear the portion of the Legend referring to such transfer conditions.

In addition to the Legend, until the expiration of the "one-year distribution compliance period" within the meaning of Rule 903 of Regulation S under the Securities Act, each Security (and all Securities issued in exchange therefor or substitution thereof) shall bear a legend (the "Reg. S Legend") to substantially the following effect:

> THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF EXCEPT IN ACCORDANCE WITH THE PROVISIONS OF REGULATION S (SECTION 230.901 THROUGH SECTION 230.905, AND PRELIMINARY NOTES). HEDGING TRANSACTIONS INVOLVING THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE CONDUCTED UNLESS IN COMPLIANCE WITH THE ACT.

At the expiration of such "one-year distribution compliance period," the

Company shall permit the Holder of such Security to exchange such Security for a new Security which does not bear the Reg. S Legend.

(c) If any mutilated Security is surrendered to the Company, the Company shall execute and deliver a new Security of like aggregate Principal Amount.

If there is delivered to the Company:

(i) evidence to its reasonable satisfaction of the destruction, loss or theft of any Security; and

(ii) such security or indemnity as may be reasonably satisfactory to the Company to save it harmless,

then, in the absence of actual notice to the Company that such Security has been acquired by a bona fide purchaser, the Company shall execute and deliver, in lieu of any such destroyed, lost or stolen Security, a new Security of like aggregate Principal Amount.

In case any such mutilated, destroyed, lost or stolen Security has become or is about to become due and payable, the Company, in its discretion, but subject to conversion rights, may, instead of issuing a new Security, pay such Security, upon satisfaction of the conditions set forth in the preceding paragraph.

11. AMENDMENTS AND WAIVERS

(a) Any term, covenant, agreement or condition of the Securities may, with the consent of the Company, be amended, or compliance therewith may be waived (either generally or in a particular instance and either retroactively or prospectively), by one or more substantially concurrent written instruments signed by the Holders of at least a majority in aggregate Principal Amount of the Securities at the time outstanding (excluding Securities at the time owned by the Company and its Affiliates); provided that, without the consent of each Holder affected, no such amendment or waiver, including a waiver pursuant to paragraph 9(d) hereof, shall:

(i) make any change in the Principal Amount of Securities whose Holders must consent to an amendment or waiver;

(ii) make any change to the manner or rate of accrual in connection with original Issue Discount, reduce the interest rate referred to in paragraph 1 of the Securities, reduce the rate of interest referred to in paragraph 12 of the Securities upon the occurrence of a Tax Event or extend the time for payment of accrued original Issue Discount or interest, if any, on any Security;

(iii) reduce the Principal Amount or the Issue Price of or extend the Stated Maturity of any Security;

(iv) reduce the Redemption Price, Purchase Price, Company Change of Control Purchase Price or Elan Change of Control Purchase Price or extend the date on which the Re-

demption Price, Purchase Price, Company Change of Control Purchase Price or Elan Change of Control Purchase Price of any Security is payable;

(v) make any Security payable in money or securities other than that stated in the Securities;

(vi) make any change in paragraph 9(d) hereof or this paragraph 11(a), except to increase any percentage referred to, or make any change in paragraph 9(e) hereof;

(vii) make any change that adversely affects the right to convert any Security (including the right to receive cash in lieu of fractional shares);

(viii) make any change that adversely affects the right to require the Company to purchase Securities in accordance with their terms; or

(ix) impair the right to institute suit for the enforcement of any payment with respect to, or conversion of, the Securities.

(b) No waiver shall extend to or affect any obligation not expressly waived or impair any right consequent thereto.

(c) The Company will not solicit, request or negotiate for or with respect to any proposed amendment or waiver of any provisions of any Security unless each Holder of Securities (irrespective of the amount of Securities then owned by it) shall be informed thereof by the Company and shall be afforded the opportunity of considering the same and shall be supplied by the Company with sufficient information to enable it to make an informed decision with respect thereto; provided, however, that preliminary discussions with one or more Holders regarding any such proposed amendment shall not constitute any such solicitation, request or negotiation. Executed or true copies of any amendment or waiver effected pursuant to this paragraph 11 shall be delivered by the Company to each Holder of Securities, by first class mail, postage prepaid, at its address appearing on the register maintained by the Company, forthwith following the date on which the same shall have been executed and delivered by the Holder or Holders of the requisite amount of outstanding Securities. The Company will not, directly or indirectly, pay or cause to be paid, remuneration, whether by way of fees or otherwise, to any Holder of Securities as consideration for or as an inducement to the entering into by such Holder of any amendment or waiver unless such remuneration is

concurrently paid, on the same terms, ratably to the Holders of all Securities then outstanding.

(d) Any amendment or waiver pursuant to this paragraph 11 shall (except as provided in paragraph 11(a)(i) through (ix) above) apply equally to all Holders and shall be binding upon them, upon each future Holder and upon the Company.

(e) In determining whether the Holders of the requisite amount of outstanding Securities have given any authorization, consent or waiver under this paragraph 11, Securities owned by the Company or any of its Affiliates shall be disregarded and deemed not to be outstanding.

12. TAX EVENT CONVERSION

(a) From and after the date (the "Tax Event Date") of the occurrence of a Tax Event, at the option of the Company, interest in lieu of future Original Issue Discount shall accrue at 8.0% per annum on a principal amount per Security (the "Restated Principal Amount") equal to the Issue Price plus accrued Original Issue Discount to the date immediately prior to the Tax Event Date or the date on which the Company exercises the option described in this paragraph 12(a), whichever is later (such date, the "Option Exercise Date"). Such interest shall accrue from the Option Exercise Date and shall be payable on November 9 and May 9 of each year (the "Interest Payment Date") to the Holders of record at the close of business on October 25 and April 24 (each, a "Regular Record Date") immediately preceding such Interest Payment Date. Interest will be computed on the basis of a 360-day year consisting of twelve 30-day months and will accrue from the most recent date on which interest has been paid or, if no interest has been paid, from the Option Exercise Date. Within 15 days of the occurrence of a Tax Event, the Company shall mail a written notice of such Tax Event to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company.

(b) On each Interest Payment Date, concurrently with the payment of the interest due and payable on such date, the Company shall issue and deliver to each Holder of a Security to whom such interest is paid, an option (which option shall be in the form of a written instrument duly executed by the Company (a "Tax Event Option") to purchase a number of shares of Common Stock equal to the quotient obtained by dividing (x) the aggregate amount of such interest due and payable to such Holder on

such Interest Payment Date in respect of such Security by (y) the Conversion Price of such Security in effect on the Business Day immediately prior to such Interest Payment Date. Such Tax Event Option shall be exercisable, in whole at any time or in part from time to time, on or prior to November 9, 2008. Each Tax Event Option shall include provisions substantially similar to those set forth in paragraph 6(c), (d), (e), (f), (g), (h) and (i) hereof. Each Tax Event Option shall be transferable by the holder thereof only together with the Security in respect of which such Tax Event option was issued, subject to compliance with all applicable transfer restrictions of federal and state securities laws.

(c) Interest on any Security that is payable, and is punctually paid or duly provided for, on any Interest Payment Date shall be paid to the person in whose name that Security is registered at the close of business on the Regular Record Date for such interest. Each installment of interest on any Security shall be paid by wire transfer in immediately - available funds to an account designated in writing by the payee at least 2 Business Days prior to the Interest Payment Date applicable thereto.

(d) Subject to the foregoing provisions of this paragraph 12, each Security upon registration of transfer, or in exchange for or in lieu of any other Security, shall carry the rights to interest accrued and unpaid, and to accrue, which were carried by such other Security.

13. MISCELLANEOUS

(a) Any notices or other communications required or permitted hereunder shall be sufficiently given if delivered personally, sent by nationally recognized overnight delivery service or facsimile (receipt confirmed) or mailed by first-class mail, postage prepaid, addressed as follows:

(i) if to the Company, to:

Ligand Pharmaceuticals Incorporated
10275 Science Center Drive
San Diego, California 92121
Attn: General Counsel
Fax No.: (619) 550-1825

with a copy to:

Brobeck, Phleger & Harrison LLP

550 West C Street, Suite 1300
San Diego, California 92101-3532
Attn: Faye H. Russell, Esq.
Fax No.: (619) 234-3848

(ii) if to any Holder, at its address appearing in the register maintained by the Company pursuant to paragraph 10(a) hereof

(iii) (x) on the date delivered, if delivered by facsimile or personally, (y) on the day after the notice is delivered into the possession and control of a nationally recognized overnight delivery service, duly marked for delivery to the receiving party or (z) three Business Days after being mailed by first-class mail, postage prepaid. The Company, by written notice to each of the Holders, may designate a different address for subsequent notices or communications.

(b) All agreements of the Company in this Security shall bind its successor.

(c) Each provision of this Security shall be considered separable and if for any reason any provision which is not essential to the effectuation of the basic purpose of this Security shall be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

(d) THIS SECURITY SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK, AS APPLIED TO CONTRACTS MADE AND PERFORMED WITHIN THE STATE OF NEW YORK, WITHOUT GIVING EFFECT TO THE PRINCIPLES OF CONFLICTS OF

LAW TO THE EXTENT THAT THE APPLICATION OF LAWS OF ANOTHER JURISDICTION WOULD BE REQUIRED THEREBY.

(e) Upon conversion of this Security in accordance with the terms hereof, the Holder will be entitled to the benefits of the Registration Rights Agreement or the New Registration Rights Agreement, as the case may be, with respect to the shares of Common Stock issuable to such Holder upon such conversion.

14. DEFINITIONS

"Accrual Increase" has the meaning specified in paragraph 1(c) hereof.

"Additional Amounts" has the meaning specified in paragraph 7(g) hereof.

"Affiliate" of any specified Person means any other Person directly or indirectly controlling or controlled by or under direct or indirect common control with such specified Person. For the purposes of this definition, "control," when used with respect to any specified Person means the power to direct or cause the direction of the management and policies of such Person, directly or indirectly, whether through the ownership of Voting Stock, by contract or otherwise; and the terms "controlling" and "controlled" have meanings correlative to the foregoing.

"Bankruptcy Law" means Title 11, U.S. Code or any similar federal or state law for the relief of debtors.

"Business Day" means each day of the year on which banking institutions are not required or authorized to close in The City of New York.

"Capital Stock" means, with respect to any Person, any and all shares, interests, participations or other equivalents (however designated and whether or not voting) of corporate stock, partnership interests or any other participation, right or other interest in the nature of an equity interest in such Person including, without limitation, common stock and preferred stock of such Person, or any option, warrant or other security convertible into any of the foregoing.

A "Change of Control" of any Person shall be deemed to have occurred at such time as (i) any other Person or group of related Persons for purposes of Section 13(d) of the Exchange Act ("Group") becomes the beneficial owner (as defined under Rule l3d-3 under the Exchange Act), directly or indirectly, of 50.0% or more of the total Voting Stock of such specified Person, (ii) there shall be consummated any consolidation or merger of such specified Person in which such specified Person is not the continuing or surviving corporation or pursuant to which the Voting Stock of such specified Person would be converted into cash, securities or other property, other than a merger or consolidation of such specified Person in which the holders of the Voting Stock of such specified Person outstanding immediately prior to the consolidation or merger hold, directly or indirectly, at least a majority of all Voting Stock of the continuing or surviving corporation immediately after such consolidation or merger or (iii) during any period of two consecutive years, individuals who at the beginning of such pe-

riod constituted the board of directors of such specified Person (together with any new directors whose election by such board of directors or whose nomination for election by the shareholders of such specified Person has been approved by a majority of the directors then still in office who either were directors at the beginning of such period or whose election or recommendation for election was previously so approved) cease to constitute a majority of the board of directors of such specified Person.

"close of business" means, with respect to any date, 5:00 PM, San Diego time, on such date, or such other city in which the Company's principal place of business may then be located.

"Closing Price" means, with respect to the Common Stock on any trading day, the last reported per share sales price of the Common Stock on such trading day, as reported by the Nasdaq National Market or, if the Common Stock is listed on a United States securities exchange, the closing per share sales price, regular

way, on such trading day on the principal United States securities exchange on which the Common Stock is traded or, if no such sale takes place on such trading day, the average of the closing bid and asked prices on such day.

"Common Stock" means the common stock, par value $0.001 per share, of the Company, as such class exists on the date of this Security as originally executed or any other shares of Capital Stock into which such common stock shall be reclassified or changed.

"Company" means Ligand Pharmaceuticals Incorporated, a Delaware corporation.

"Company Change of Control Offer" has the meaning specified in paragraph 4(b) hereof.

"Company Change of Control Offer Notice" has the meaning specified in paragraph 4(b)(i) hereof.

"Company Change of Control Payment Date" has the meaning specified in paragraph 4(b)(i)(C) hereof.

"Company Change of Control Purchase Price" has the meaning specified in paragraph 4(b) hereof.

"Company Notice" has the meaning specified in paragraph 4(a)(v) hereof.

"Company Notice Date" has the meaning referred to in paragraph 4(a)(v) hereof.

"Conversion Date" has the meaning specified in paragraph 6(d) hereof.

"Conversion Notice" has the meaning specified in paragraph 6(d) hereof.

"Conversion Price" has the meaning specified in paragraph 6(b) hereof.

"Conversion Shares" has the meaning specified in the Purchase Agreement.

"Custodian" means any receiver, trustee, assignee, liquidator or similar official under any Bankruptcy Law.

"Default" means any event which is, or after notice or passage of time or both would be, an Event of Default.

"Distributed Securities" has the meaning specified in paragraph 6(i)(iv) hereof.

"Elan" means Elan Corporation, plc, a public limited company organized and existing under the laws of Ireland.

"Elan Change of Control Notice" has the meaning specified in the Purchase Agreement.

"Elan Change of Control Payment Date" has the meaning specified in paragraph 5(b)(ii) hereof.

"Elan Change of Control Purchase" has the meaning specified in paragraph 5(a) hereof.

"Elan Change of Control Purchase Notice" has the meaning specified in paragraph 5(b) hereof.

"Elan Change of Control Purchase Price" has the meaning specified in paragraph 5(a) hereof.

"Event of Default" has the meaning specified in paragraph 10(a).

"Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations of the SEC promulgated thereunder.

"Extraordinary Cash Dividend" means cash dividends with respect to the

Common Stock the aggregate amount of which in any fiscal year exceeds the greater of (i) 10% of the consolidated net income of the Company for the fiscal year immediately preceding the payment of such dividend and (ii) $200,000.

"Holder" means a Person in whose name this Security is registered on the books of the Company.

"Initial Shares" has the meaning specified in the Purchase Agreement.

"Interest Payment Date" has the meaning specified in paragraph 12(a) hereof.

"Issue Date" of this Security means the date on which this Security was originally issued or deemed issued as set forth on the face of this Security.

"Issue Price" of this Security means, in connection with the original issuance of this Security, the initial issue price at which this Security is issued as set forth on the face of this Security.

"Legend" has the meaning specified in paragraph 10(b) hereof.

"License Agreement" has the meaning specified in the Purchase Agreement.

"License Shares" has the meaning specified in the Purchase Agreement.

"Nasdaq National Market" means the electronic interdealer quotation system operated by Nasdaq Stock Market, Inc., a subsidiary of the National Association of Securities Dealers, Inc.

"New Registration Rights Agreement" has the meaning specified in the Purchase Agreement.

"Officer" means the Chief Executive Officer, the President, any Vice President, the Treasurer or the Secretary of the Company.

"Officers' Certificate" means a written certificate, signed in the name of the Company by (i) its Chief Executive

Officer, its President or any Vice President and (ii) its Treasurer or its Secretary.

"Opinion of Counsel" means a written opinion from legal counsel. The counsel may be an employee of, or counsel to, the Company or any Successor Company.

"Option Exercise Date" has the meaning specified in paragraph 12(a) hereof.

"Original Issue Discount" of this Security means the difference between the Issue Price and the Principal Amount of this Security as set forth on the face of this Security. For purposes of this Security, accrual of Original Issue Discount shall be calculated on a semi-annual bond equivalent basis using a 360 day year consisting of twelve 30-day months.

"Person" means any individual, corporation, partnership, limited liability company, joint venture, association, joint-stock company, trust, unincorporated organization or government, or any agency or political subdivision thereof.

"Principal" or "Principal Amount" of this Security means the Principal Amount as set forth on the face of this Security.

"Purchase Agreement" has the meaning specified on the face of this Security.

"Purchase Date" has the meaning specified in paragraph 4(a) hereof.

"Purchase Notice" has the meaning specified in paragraph 4(a)(i) hereof.

"Purchase Price" has the meaning specified in paragraph 4(a) hereof.

"Purchase Request" has the meaning specified in the Purchase Agreement.

"Redemption Date" means a date specified for redemption of this Security in

accordance with the terms hereof.

"Redemption Price" has the meaning specified in paragraph 3(a) hereof.

"Registration Rights Agreement" has the meaning specified in the Purchase Agreement.

"Registration Rights Default" has the meaning specified in paragraph 1(c) hereof.

"Regular Record Date" has the meaning specified in paragraph 12(a) hereof.

"Restated Principal Amount" has the meaning specified in paragraph 12(a) hereof.

"SEC" means the Securities and Exchange Commission.

"Securities" means any of the Company's Zero Coupon Convertible Senior Notes due 2008, as amended and supplemented from time to time in accordance with the terms hereof, issued pursuant to the Purchase Agreement.

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations of the SEC promulgated thereunder.

"Shares" has the meaning specified in the Purchase Agreement.

"Stated Maturity" means November 9, 2008.

"Subsidiary" of any specified Person means any corporation, partnership, joint venture, limited liability company, association or other business entity, whether now existing or hereafter organized or acquired, (i) in the case of a corporation, of which more than 50% of the total voting power of the Capital Stock entitled (without regard to the occurrence of any contingency) to vote in the election of directors, officers or trustees thereof is held by such specified Person or any of its Subsidiaries or (ii) in the case of a partnership, joint venture, limited liability company, association or other business entity, with respect to which such specified Person or any of its Subsidiaries has the power to direct or cause the direction of the management and policies of such entity by contract or otherwise.

"Successor Company" has the meaning specified in paragraph 8(a)(1) hereof.

"Tax Event" means that the Company shall have received an opinion from independent tax counsel experienced in such matters to the effect that, on or after the date of this Security, as a result of (a) any amendment to, or change (including any announced prospective change) in, the laws (or any regulations

thereunder) of the United Sates or any political subdivision or taxing authority thereof or therein or (b) any amendment to, or change in, an interpretation or application of such laws or regulations by any legislative body, court, governmental agency or regulatory authority, in each case, which amendment or change is enacted, promulgated, issued or announced or which interpretation is issued or announced or which action is taken, on or after the date of this Security, there is more than an insubstantial risk that interest (including Original Issue Discount) payable on the Securities either (i) would not be deductible on a current accrual basis or (ii) would not be deductible under any other method, in either case, in whole or in part, by the Company, by reason of deferral, disallowance or otherwise) for United States federal income tax purposes.

"Tax Event Date" has the meaning specified in paragraph 12(a) hereof.

"Tax Event Option" has the meaning specified in paragraph 12(b) hereof.

"Taxes" means any present or future tax, duty, levy, impost, assessment or other government charge (including penalties, interest and any other liabilities related thereto) imposed or levied by or on behalf of a any government or any

political subdivision or territory or possession of any government or any authority or agency therein or thereof having power to tax.

"Transfer Restricted Security" has the meaning specified in paragraph 10(b) hereof.

"Voting Stock" means stock of any class or classes, however designated, having general voting power under ordinary circumstances to elect a majority of the board of directors, managers or trustees of a Person, other than stock having such power only by reason of the occurrence of a contingency.

ANNEX A

FORM OF PURCHASE NOTICE
OF
ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

Ligand Pharmaceuticals Incorporated
10275 Science Center Drive
San Diego, California 92121

Attention: General Counsel

1. Pursuant to the terms of the Zero Coupon Convertible Senior Note due 2008 (certificate no. [ ] in the Principal Amount of $[ ] (the "Security"), the undersigned hereby elects to cause Ligand Pharmaceuticals incorporated (the "Company") to purchase $[ ] Principal Amount of the Security at the Purchase Price set forth in the Security on [November 9, 2002] [November 9, 2005], subject to the right of the undersigned to convert the Security at any time prior to the close of business on the Purchase Date. Capitalized terms used herein and not otherwise defined have the meanings specified in the Security.

2. In the event that the Security is purchased in part, please execute and deliver to the undersigned a new Security in a denomination equal in Principal Amount to the unpurchased portion of the Security.

3. In the event that the Company has elected to pay the Purchase Price with Common Stock (the "Shares") Pursuant to paragraph 4(a)(iv) of the Security, the undersigned confirms that:

(a) We understand that the Shares have not been registered under the Securities Act and may not be offered or sold except as permitted in the following sentence. We agree that if we should sell or otherwise transfer the Shares, we will do so only (i) to the Company or its Subsidiaries, (ii) inside the United States to an institutional "accredited investor" (as defined below), (iii) outside the United States in accordance with Regulation S under the Securities Act, (iv) pursuant to the exemption from registration provided by Rule 144 under the Securities Act (if available) or (v) pursuant to an effective registration statement under the Securities Act.

(b) We understand that the certificates representing the Shares will, so long as appropriate, bear the following legends:

THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT UNDER THE ACT OR PURSUANT TO A VALID EXEMPTION THEREFROM. THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF EXCEPT IN ACCORDANCE WITH THE PROVISIONS OF REGULATION S (SECTION 230.901 THROUGH SECTION 230.905, AND PRELIMINARY NOTES). HEDGING TRANSACTIONS INVOLVING THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE CONDUCTED UNLESS IN COMPLIANCE WITH THE ACT.

THE TRANSFER OF THE SECURITY EVIDENCED HEREBY IS SUBJECT TO THE CONDITIONS SPECIFIED IN A SECURITIES PURCHASE AGREEMENT,

DATED AS OF NOVEMBER 6, 1998, BY AND AMONG THE COMPANY, ELAN INTERNATIONAL SERVICES, LTD. AND ELAN CORPORATION, PLC, AND THE COMPANY RESERVES THE RIGHT TO REFUSE THE TRANSFER OF SUCH SECURITY UNTIL SUCH CONDITIONS HAVE BEEN FULFILLED WITH RESPECT TO SUCH TRANSFER. A COPY OF SUCH CONDITIONS WILL BE FURNISHED BY THE COMPANY TO THE HOLDER HEREOF WITHOUT CHARGE.

(c) We are acquiring the Shares for our own account and are either (i) an institutional "accredited investor" (as defined in Rule 501(a)(1), (2), (3) or (7) of Regulation D under the Securities Act) or (ii) a foreign purchaser that is outside the United States (as such terms are used under Regulations S under the Securities Act). We have such knowledge and experience in financial and business matters to be capable of evaluating the merits and risks of our investment in the Shares and we are able to bear the economic risk of our investment for an indefinite period of time.

This certificate and the statements contained herein are made for the benefit of the Company.

Signature of Holder

Date:

ANNEX B

CONVERSION NOTICE
OF
ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

Ligand Pharmaceuticals Incorporated
10275 Science Center Drive
San Diego, California 92121

Attention: General Counsel

1. Pursuant to the terms of the Zero Coupon Convertible Senior Note due 2008 (certificate no. [ ] in the Principal Amount of $[ ] attached hereto (the "Security"), the undersigned hereby elects to cause Ligand Pharmaceuticals Incorporated (the "Company") to convert $[ ] Principal Amount of the Security pursuant to paragraph 6 of the Security at the Conversion Price. Capitalized terms used herein and not otherwise defined have the meanings specified in the Security.

2. In the event that the undersigned has elected to convert the Security in part, please execute and deliver to the undersigned a new Security in a denomination equal in Principal Amount to the unconverted portion of the Security.

3. In connection with the conversion of the Security, the undersigned confirms that:

(a) We understand that the securities to be issued upon such conversion have not been registered under the Securities Act and may not be offered or sold except as permitted in the following sentence. We agree that if we should sell or otherwise transfer such securities, we will do so only (i) to the Company or its Subsidiaries, (ii) inside the United States to an institutional "accredited investor" (as defined below), (iii) outside the United States in accordance with Regulation S under the Securities Act, (iv) pursuant to the exemption from registration provided by Rule 144 under the Securities Act (if available) or (v) pursuant to an effective registration statement under the Securities Act.

(b) We understand that the certificates representing such securities will, so long as appropriate, bear the following legends:

THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES

ACT OF 1933, AS AMENDED (THE "ACT"), MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT UNDER THE ACT OR PURSUANT TO A VALID EXEMPTION THEREFROM. THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF EXCEPT IN ACCORDANCE WITH THE PROVISIONS OF REGULATION S (SECTION 230.901 THROUGH SECTION 230.905, AND PRELIMINARY NOTES). HEDGING TRANSACTIONS INVOLVING THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE CONDUCTED UNLESS IN COMPLIANCE WITH THE ACT.

THE TRANSFER OF THE SECURITY EVIDENCED HEREBY IS SUBJECT TO THE CONDITIONS SPECIFIED IN A SECURITIES PURCHASE AGREEMENT, DATED AS OF NOVEMBER 6, 1998, BY AND AMONG THE COMPANY, ELAN INTERNATIONAL SERVICES, LTD. AND ELAN CORPORATION, PLC, AND THE COMPANY RESERVES THE RIGHT TO REFUSE THE TRANSFER OF SUCH SECURITY UNTIL SUCH CONDITIONS HAVE BEEN FULFILLED WITH RESPECT TO SUCH TRANSFER. A COPY OF SUCH CONDITIONS WILL BE FURNISHED BY THE COMPANY TO THE HOLDER HEREOF WITHOUT CHARGE.

(c) We are acquiring the securities to be issued upon conversion of the Security for our own account and are either (i) an institutional "accredited investor" (as defined in Rule 501(a)(1), (2), (3) or (7) of Regulation D under the Securities Act) or (ii) a foreign purchaser that is outside the United States. We have such knowledge and experience in financial and business matters to be capable of evaluating the merits and risks of our investment in the securities and we are able to bear the economic risk of our investment for an indefinite period of time.

This certificate and the statements contained herein are made for the benefit of the Company.

Signature of Holder

Date:

ANNEX C

FORM OF CERTIFICATE FOR
REGISTRATION OF TRANSFER
OR EXCHANGE
OF
ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

Ligand Pharmaceuticals Incorporated
10275 Science Center Drive
San Diego, California 92121

Attention: General Counsel

1. Reference is hereby made to the Zero Coupon Convertible Senior Note due 2008 (certificate no. [ ] in the Principal Amount of $[ ] attached hereto (the "Security"). Capitalized terms used herein and not otherwise defined have the meanings specified in the Security.

2. In connection with the registration of transfer or exchange of such Security, the undersigned hereby certifies that:

CHECK ONE

_____ The Security is being acquired for the undersigned's own account, without transfer; or

_____ The Security is being transferred to the Company; or

_____ The Security is being transferred in a transaction permitted by Rule 144 under the Securities Act; or

_____ The Security is being transferred pursuant to an effective registration statement; or

_____ The Security is being transferred in a transaction permitted by Rule 904 under the Securities Act; or

_____ The Security is being transferred pursuant to an exemption from the registration requirements of the Securities Act other than Rule 144 or Rule 904, and the undersigned hereby further certifies that the Security is being transferred in compliance with the exemption claimed, which certification is supported by an opinion of

counsel, if required by the Company, provided by the undersigned or the transferee (a copy of which the undersigned has attached to this certification) in form reasonably satisfactory to the Company, to the effect that such transfer is in compliance with the Securities Act;

and the Security is being transferred in compliance with any applicable state securities or "Blue Sky" laws of any state of the United States.

(3) This certificate and the statements contained herein are made for the benefit of the Company.

Signature of Holder

Date:

ANNEX D

FORM OF UNRESTRICTED SECURITIES CERTIFICATE
OF
ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

Ligand Pharmaceuticals Incorporated
10275 Science Center Drive
San Diego, California 92121

Attention: General Counsel

1. Reference is hereby made to the Zero Coupon Convertible Senior Note due 2008 (certificate no. [ ] in the Principal Amount of $[ ] attached hereto (the "Security"). Capitalized terms used herein and not otherwise defined have the meanings specified in the Security.

2. The undersigned, the registered owner of the Security, has requested that the Security be exchanged for a new Security bearing no portion of the Legend (excluding that portion of the Legend relating to transfer conditions set forth in the Purchase Agreement). In connection with such exchange, the undersigned hereby certifies that the exchange is occurring after a period of at least two years has elapsed since the date the Security was acquired from the Company or any affiliate (as such term is defined under Rule 144 under the Securities Act) of the Company, whichever is later, and the undersigned is not, and during the preceding three months has not been, an affiliate of the Company. The undersigned also acknowledges that future transfers of the Security must comply with all applicable state securities or "Blue Sky" laws.

3. This certificate and the statements contained herein are made for the benefit of the Company.

Signature of Holder

Date:

EXHIBIT 10.196

THE SECURITY EVIDENCED HEREBY HAS NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT UNDER THE ACT OR PURSUANT TO A VALID EXEMPTION THEREFROM AND HAS BEEN SOLD IN RELIANCE ON THE EXEMPTION FROM REGISTRATION PROVIDED BY REGULATION S UNDER THE ACT ("REGULATION S"). THE SECURITY EVIDENCED HEREBY MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF EXCEPT IN ACCORDANCE WITH THE PROVISIONS OF REGULATION S (SECTION 230.901 THROUGH SECTION 230.905, AND PRELIMINARY NOTES).

THE TRANSFER OF THE SECURITY EVIDENCED HEREBY IS SUBJECT TO THE CONDITIONS SPECIFIED IN A SECURITIES PURCHASE AGREEMENT, DATED AS OF NOVEMBER 6, 1998, BY AND AMONG THE COMPANY, ELAN INTERNATIONAL SERVICES, LTD. AND ELAN CORPORATION, PLC, AND THE COMPANY RESERVES THE RIGHT TO REFUSE THE TRANSFER OF SUCH SECURITY UNTIL SUCH CONDITIONS HAVE BEEN FULFILLED WITH RESPECT TO SUCH TRANSFER. A COPY OF SUCH CONDITIONS WILL BE FURNISHED BY THE COMPANY TO THE HOLDER HEREOF WITHOUT CHARGE.

LIGAND PHARMACEUTICALS INCORPORATED

ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

No. R-2

Issue Date: November 9, 1998

Issue Price: $10,000,000
($456.39 for each $1,000 Principal Amount)

Original Issue Discount at Maturity: $11,911,231
($543.61 for each $1,000 Principal Amount)

Ligand Pharmaceuticals Incorporated, a Delaware corporation, promises to pay to Elan International Services, Ltd. or registered assigns, on November 9, 2008, the Principal Amount of TWENTY ONE MILLION NINE HUNDRED AND ELEVEN THOUSAND TWO HUNDRED AND THIRTY ONE DOLLARS ($21,911,231) or such Principal Amount as may result from an Accrual Increase as specified on the other side of this Security.

This Security shall not bear interest except as specified on the other side of this Security. Original Issue Discount will accrue as specified on the other side of this Se-

curity. This Security is convertible into Common Stock as specified on the other side of this Security.

Additional provisions of this Security are set forth on the other side of this Security.

This Security is one of the Zero Coupon Convertible Senior Notes due 2008 issued pursuant to the Securities Purchase Agreement, dated as of November 6, 1998, by and among Ligand Pharmaceuticals Incorporated, Elan International Services, Ltd. and Elan Corporation, plc (the "Purchase Agreement").

IN WITNESS WHEREOF, Ligand Pharmaceuticals Incorporated has caused this instrument to be duly executed.

LIGAND PHARMACEUTICALS INCORPORATED

By: /s/ WILLIAM L. RESPESS

Name: William L. Respess
Title: Senior Vice President, General Counsel, Government Affairs

Attest

By: /s/ DAVID E. ROBINSON

Name: David E. Robinson
Title: President and Chief Executive Officer

Dated:

FORM OF REVERSE SIDE OF SECURITY

LIGAND PHARMACEUTICALS INCORPORATED

ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

1. INTEREST

(a) This Security shall not bear interest, except as specified in this paragraph or in paragraph 12 hereof. If the Principal Amount hereof or any portion of such Principal Amount is not paid when due (whether upon acceleration pursuant to paragraph 9 hereof, upon the date set for payment of the Redemption Price pursuant to paragraph 3 hereof, upon the date set for payment of a Purchase Price or a Company Change of Control Purchase Price pursuant to paragraph 4 hereof, upon the date set for payment of the Elan Change of Control Purchase Price pursuant to paragraph 5 hereof or upon the Stated Maturity of this Security) or if shares of Common Stock (and cash in lieu of fractional shares) in respect of a conversion of this Security in accordance with paragraph 6 hereof are not delivered when due, then, in each such case, the overdue amount shall bear interest at the rate of 10.0% per annum, compounded semiannually (to the extent that the payment of such interest shall be legally enforceable), which interest shall accrue from the date such overdue amount was due to the date payment of such amount, including interest thereon, has been made. All such interest shall be payable on demand. The accrual of such interest on overdue amounts shall be in lieu of, and not in addition to, the continued accrual of Original Issue Discount.

(b) Original Issue Discount (the difference between the Issue Price and the Principal Amount of a Security) in the period during which a Security remains outstanding shall accrue at 8.0% per annum, on a semiannual bond equivalent basis using a 360-day year consisting of twelve 30-day months, commencing on the Issue Date of this Security, and shall cease to accrue on the earlier of (i) the date on which the Principal Amount hereof or any portion of such Principal Amount becomes due and payable and (ii) any Redemption Date, Purchase Date, Company Change of Control Payment Date, Elan Change of Control Payment Date or Conversion Date.

(c) In the event that the Company defaults in the performance or observance of any agreement, covenant, term or condition contained in the Registration Rights Agreement or the New Registration Rights Agreement, as the case may be, and such

default continues for a period of 30 days after receipt by the Company of notice thereof (provided that, if such default is not cured on or prior to the last day of such 30 day period and such breach is then capable of being cured and the Company is then working in good faith to cure such default, such 30 day period shall be extended by an additional 20 days from the last day of such 30 day period) (a "Registration Rights Default"), the Company acknowledges that the Holders of the Securities will suffer damages and that it would not be feasible to ascertain the extent of such damages with precision. Accordingly, the Company agrees that, as liquidated damages, the rate at which Original Issue Discount or interest pursuant to paragraph 1(a) or 12 hereof, if any, accrues shall be increased over and above the rate stated in paragraph 1(b), 1(a) and 12(a), respectively (an "Accrual Increase"), by an additional 50 basis points for each 90-day period in which a Registration Rights Default continues; provided that the aggregate of such Accrual Increase shall not exceed 200 basis points over and above the rate set forth in paragraph l(b), 1(a) and 12(a) hereof, as the case may be; provided, further, that any Accrual Increase shall immediately

cease upon the cure of any such Registration Rights Default. Whenever, in this Security, there is mentioned, in any context, Principal Amount, Original Issue Discount or interest, or any other amount payable under or with respect to this Security, including the Redemption Price, the Purchase Price, the Company Change of Control Purchase Price and the Elan Change of Control Purchase Price, such mention shall be deemed to include mention of an Accrual Increase to the extent that, in such context, such Accrual Increase is, was or would be in effect.

2. METHOD OF PAYMENT

Holders must surrender Securities to the Company to collect payments in respect of the Securities. The Company will pay cash amounts in money of the United States that at the time of payment is legal tender for payment of public and private debts (and all references in the Securities to "$" or "dollars" shall refer to such currency) by wire transfer in immediately available funds, to an account or accounts designated in writing by each Holder not less than 5 Business Days prior to the date of the applicable payment.

3. REDEMPTION AT THE OPTION OF THE COMPANY

(a) No sinking fund is provided for the Securities. The Securities are redeemable as a whole at any time, or in part from time to time, at the option of the Company, at the redemp-

tion prices (each, a "Redemption Price") set forth in paragraph 3(b) hereof; provided that the Securities are not redeemable prior to November 9, 2001.

(b) The table below shows the Redemption Prices of a Security per $1,000 Principal Amount on the dates shown below and at Stated Maturity, which prices reflect accrued Original Issue Discount calculated to each such date. The Redemption Price of a Security redeemed between such dates would include an additional amount reflecting the additional Original Issue Discount accrued since the next preceding date in the table to the actual Redemption Date.

<TABLE>
<CAPTION>

Redemption Date	(1) Security Issue Price	(2) Accrued Original Issue Discount At 8.0	(3) Redemption Price (1) + (2)
<S>	<C>	<C>	<C>
November 9, 2001	$456.39	$121.09	$ 577.48
November 9, 2002	456.39	168.21	624.60
November 9, 2003	456.39	219.17	675.56
November 9, 2004	456.39	274.30	730.69
November 9, 2005	456.39	333.92	790.31
November 9, 2006	456.39	398.41	854.80
November 9, 2007	456.39	468.17	924.56
At maturity	456.39	543.61	1,000.00

</TABLE>

If converted to a semiannual coupon note following the occurrence of a Tax Event, the Securities will be redeemable at the Restated Principal Amount plus interest accrued and unpaid from, and including, the date of such conversion to, but excluding, the Redemption Date.

(c) If less than all of the Securities are to be redeemed, the Company shall select the Securities to be redeemed pro rata. If any Security selected for redemption is thereafter surrendered for conversion in part, the converted portion of such Security shall be deemed (so far as may be), solely for purposes of determining the aggregate Principal Amount of Securities to be redeemed by the Company, the portion selected for redemption. Nothing in this paragraph 3 shall affect the right of any Holder to convert any Security pursuant to paragraph 6 hereof.

(d) Provisions of this Security that apply to the redemption of all of a Security also apply to the redemption of any portion of such Security.

(e) At least 30 days but not more than 60 days before a Redemption Date, the Company shall cause notice of redemption to be mailed, by first-class mail, postage prepaid, to each Holder of Securities at such Holder's address appearing on the register maintained by the Company. Such notice shall identify the Securities to he redeemed and shall state:

(i) the Redemption Date;

(ii) the Redemption Price;

(iii) the Conversion Price in effect on the date of such notice;

(iv) that Securities called for redemption may be converted at any time prior to the close of business on the Redemption Date;

(v) that Securities called for redemption must be surrendered to the Company to collect the Redemption Price and the procedures to be followed to so surrender such Securities;

(vi) if fewer than all the outstanding Securities are to be redeemed, the identification and Principal Amounts of the particular Securities to be redeemed;

(vii) that, unless the Company defaults in payment of the Redemption Price, Original Issue Discount on the Securities called for redemption and interest, if any, will cease to accrue on and after the Redemption Date;

(viii) that Holders whose Securities are being redeemed only in part will, without charge, be issued a new Security equal in Principal Amount to the unredeemed portion of the Securities; and

(ix) that the Redemption Price for any Security called for redemption will be paid one Business Day following the later of (x) the Redemption Date and (y) the date such Security is surrendered to the Company.

(f) Once notice of redemption is given, Securities called for redemption shall become due and payable on the Redemption

Date and at the Redemption Price stated in such notice, except for Securities that are converted. The Redemption Price for the Securities called for redemption shall be paid one Business Day following the later of (x) the Redemption Date and (y) the date such Securities are surrendered to the Company.

(g) Receipt by the Company of the Securities called for redemption prior to, on or after the Redemption Date shall be a condition to the receipt by the Holder of the Redemption Price therefor.

(h) Upon surrender of a Security that is redeemed in part, the Company shall, without charge, execute and deliver to the Holder a new Security equal in Principal Amount to the unredeemed portion of such Security.

4. PURCHASE BY THE COMPANY AT THE OPTION OF THE HOLDER

(a) Purchase at the option of the Holder. The Company shall be obligated to purchase, at the option of the Holder, the Securities held by such Holder on the following purchase dates (each, a "Purchase Date") and at the following purchase prices per $1,000 Principal Amount (each, a "Purchase Price"), which Purchase Prices reflect accrued original Issue Discount to each such date. Such Purchase Prices may be paid, at the option of the Company, in cash or by the issuance and delivery of shares of Common Stock, subject to the conditions set forth in paragraph 4(a)(iv) hereof.

<TABLE>
<CAPTION>

Purchase Date	(1) Security Issue Price	Accrued Original Issue Discount at 8.0%	(3) Purchase Price (1) + (2)
<S>	<C>	<C>	<C>
November 9, 2002.....	456.39	$ 168.21	$624.60
November 9, 2005.....	456.39	333.92	790.31

</TABLE>

If, prior to the Purchase Date, the Securities have been converted to a semiannual coupon note following the occurrence of a Tax Event, the Purchase Price will be equal to the Restated Principal Amount plus interest accrued and unpaid from, and including, the date of such conversion to, but excluding, the Purchase Date.

(i) In order to have Securities purchased pursuant to this paragraph 4(a), the Holder shall (x) deliver to the Company (for each Security or portion thereof to be

purchased) a written notice of purchase in the form attached to this Security as Annex A (a "Purchase Notice") at any time on or prior to the close of business on such Purchase Date and (y) surrender such Securities to the Company prior to, on or after the Purchase Date, such surrender being a condition to receipt by the Holder of the Purchase Price therefor.

Provisions of this Security that apply to the purchase of all of a Security also apply to the purchase of any portion of such Security.

Subject to the right of a Holder to convert Securities as to which a Purchase Notice has been delivered into Common Stock at any time prior to the close of business on the Purchase Date, such Holder may not withdraw such Purchase Notice.

Any purchase of Securities contemplated pursuant to this paragraph 4(a) shall be consummated by the delivery of the Purchase Price to be received by the Holder (in cash or Common Stock, as the case may be) one Business Day following the later of (x) the Purchase Date and (y) the date such Securities are surrendered to the Company.

(ii) The Securities to be purchased pursuant to this paragraph 4(a) may be paid for, at the option of the Company, in cash or Common Stock, subject to the conditions set forth in paragraph 4(a)(iv) hereof. The Company shall designate, in the Company Notice (as defined below) delivered pursuant to paragraph 4(a)(v) hereof, whether the Company will purchase the Securities for cash or Common Stock; provided that the Company will pay cash for fractional shares of Common Stock pursuant to paragraph 4(a)(iv)(A) hereof. The Company may not change its election with respect to the consideration to be paid once the Company has given the Company Notice, except pursuant to paragraph 4(a)(iv)(B) hereof.

(iii) on each Purchase Date, if the Company Notice shall state that the Company will purchase Securities for cash, the Securities in respect of which a Purchase Notice has been given shall be purchased by the Company with cash in an amount equal to the aggregate Purchase Price of such Securities.

(iv) on each Purchase Date, if the Company Notice shall state that the Company will purchase Securities for

Common Stock, the Securities in respect of which a Purchase Notice has been given shall be purchased by the Company by the issuance of a number of whole shares of Common Stock equal to the quotient obtained by dividing (x) the amount of cash to which the Holder would have been entitled had the Company elected to pay the Purchase Price of such Securities in cash by (y) the average of the Closing Prices of the Common Stock for the 20

consecutive trading days ending on and including the second trading day immediately preceding the Purchase Date, subject to paragraph 4(a)(iv)(A) hereof.

(A) The Company will not issue a fractional share of Common Stock in payment of the Purchase Price. Instead, the Company will pay cash in an amount equal to the current market value of the fractional share. The current market value of a fraction of a share of Common Stock shall be determined by multiplying the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately preceding the Purchase Date by such fraction and rounding to the nearest whole cent, with one-half cent being rounded upward. It is understood that if a Holder elects to have more than one Security purchased, the number of whole shares of Common Stock shall be based on the aggregate amount of Securities to be purchased.

(B) The Company's right to elect to purchase the Securities of any Holder through the issuance of shares of Common Stock shall be conditioned upon the following: (x) assuming compliance with all applicable state securities or "Blue Sky" laws, and assuming the accuracy of the statements of such Holder set forth in the Purchase Notice, the issuance of such shares of Common Stock shall be exempt from the registration requirements of Section 5 of the Securities Act, (y) no consent, approval, authorization or order of any court or governmental agency or body or third party shall be required for the issuance by the Company of such shares of Common Stock and (z) such Holder shall have received an Opinion of Counsel (which shall be included with the Company Notice) stating that the terms of the issuance of such Common stock are in conformity with this paragraph 4(a), that such Common Stock has been duly authorized and, upon issuance, will be validly issued, nonassessable

and fully paid, will not be issued in violation of any preemptive or similar rights and will be free of any liens, encumbrances or restrictions on transfer imposed by the Company other than those imposed by the Securities Act and applicable state securities or "Blue Sky" laws (provided that such Opinion of Counsel may state that, insofar as it relates to the absence of preemptive or similar rights, it is given upon the best knowledge of such counsel) and that clause (x) of this paragraph 4(a)(iv)(B) has been satisfied.

(C) If the conditions set forth in paragraph 4(a)(iv)(B) hereof are not satisfied as of the Purchase Date, and the Company shall have elected to purchase the Securities through the issuance of shares of Common Stock, the Company shall, without further notice, pay the Purchase Price in cash.

(v) The Company shall cause a notice of its election to pay the Purchase Price with cash or Common Stock (the "Company Notice") to be sent by first-class mail, postage prepaid, to the Holders at their addresses appearing in the register maintained by the Company. The Company Notice shall be sent to Holders on a date not less than 20 Business Days prior to the Purchase Date (such date being herein referred to as the "Company Notice Date"); provided that, in the event that the Company shall not have delivered the Company Notice on or prior to the Company Notice Date, the Company shall be deemed to have irrevocably elected to pay the Purchase Price in cash. The Company Notice shall state the manner of payment elected and shall contain the following information:

In the event that the Company has elected to pay the Purchase Price with Common Stock, the Company Notice shall state that each Holder will receive Common Stock (except for any cash amount to be paid in lieu of fractional shares) in accordance with this paragraph 4(a) and shall be accompanied by the Opinion of Counsel described in paragraph 4(a)(iv)(B) hereof.

In any case, each Company Notice will include the Purchase Notice to be completed by the Holder and shall state:

(A) the Purchase Price on such Purchase Date and the Conversion Price in effect on the date of the Company Notice;

(B) that Securities must be surrendered to the Company to collect payment and any procedures to be followed in so surrendering the Securities,

(C) that Securities as to which a Purchase Notice has been given may be converted at any time prior to the close of business on the applicable Purchase Date;

(D) that, unless the Company defaults in the payment of the Purchase Price, Original Issue Discount on all Securities in respect of which a Purchase Notice has been delivered or interest, if any, will cease to accrue on and after the Purchase Date;

(E) that Holders whose Securities are being purchased only in part will, without charge, be issued a new Security equal in Principal Amount to the unpurchased portion of the Securities; and

(F) that the Purchase Price for any Security as to which a Purchase Notice has been given will be paid one Business Day following the later of (x) the Purchase Date and (y) the date such Security is surrendered to the Company.

(vi) All shares of Common Stock delivered upon purchase of the Securities shall be newly issued shares or treasury shares, shall be duly and validly issued, fully paid and nonassessable, shall not be issued in violation of any preemptive or similar rights and shall be free of any liens, encumbrances or restrictions on transfer other than those imposed by the Securities Act and applicable state securities or "Blue Sky" laws.

(vii) Receipt of such Security by the Company prior to, on or after the Purchase Date shall be a condition to the receipt by the Holder of the Purchase Price therefor.

(viii) on the Business Date immediately following the later of (x) the Purchase Date and (y) the date on which such Securities are surrendered to the Company, the Company shall deliver to each Holder entitled to receive Common Stock a certificate for the number of full shares of

Common Stock issuable in payment of the Purchase Price and cash in lieu of any fractional shares.

(ix) If a Holder is paid in Common Stock, the Company shall pay any documentary, stamp or similar issue or transfer tax due on such issuance of Common Stock.

(x) Upon surrender of a Security that is to be purchased only in part, the Company shall, without charge, execute and deliver to the Holder a new Security equal in Principal Amount to the unpurchased portion of such Security.

(b) Purchase at the Option of the Holder upon Company Change of Control. Upon a Change of Control of the Company, the Company shall be obligated to make an offer to purchase all outstanding Securities (the "Company Change of Control Offer") at a purchase price per $1,000 Principal Amount (the "Company Change of Control Purchase Price") equal to the sum of (x) the Issue Price plus (y) accrued Original Issue Discount to the Company Change of Control Payment Date. If, prior to the Company Change of Control Payment Date, the Securities have been converted to a semiannual coupon note following the occurrence of a Tax Event, the Company Change of Control Purchase Price will be equal to the Restated Principal Amount plus interest accrued and unpaid from, and including, the date of such conversion to, but excluding, the Company Change of Control Payment Date.

(i) within 10 days after the occurrence of a Change of Control of the

Company, the Company shall cause a notice of the Company Change of Control Offer (the "Company Change of Control Offer Notice") to be sent by first-class mail, postage prepaid, to the Holders at their addresses appearing in the register maintained by the Company, stating:

(A) the event or events causing such Change of Control of the Company and the date such Change of Control occurred;

(B) that the Company Change of Control Offer is being made pursuant to this paragraph 4(b);

(C) the Company Change of Control Purchase Price and the purchase date (which shall be a Business Day no earlier than 10 days nor later than 30

days from the date such notice is mailed (the "Company Change of Control Payment Date"));

(D) that a Company Change of Control Purchase Notice (as defined below) must be delivered to the Company on or prior to the close of business on the Company Change of Control Payment Date and that Securities must be surrendered to the Company prior to, on or after the Company Change of Control Payment Date to collect payment, including any procedures to be followed in so surrendering the Securities;

(E) that any Security as to which a Company Change of Control Purchase Notice has not been delivered will continue to accrue Original Issue Discount or interest, if any;

(F) the Conversion Price in effect on the date of the Company Change of Control Offer Notice and any adjustments thereto resulting from such Change of Control;

(G) that the Securities as to which a Company Change of Control Purchase Notice has been given may be converted into Common Stock at any time prior to the close of business on the Company Change of Control Payment Date;

(H) that, unless the Company defaults in the payment of the Company Change of Control Payment, Original Issue Discount on all Securities as to which a Company Change of Control Purchase Notice has been delivered or interest, if any, will cease to accrue on and after the Company Change of Control Payment Date;

(I) that Holders whose Securities are being purchased only in part will, without charge, be issued a new Security equal in Principal Amount to the unpurchased portion of the Securities; and

(J) that the Company Change of Control Purchase Price for any Security as to which a Company Change of Control Purchase Notice has been given will be paid one Business Day following the later of (x) the Company Change of Control Payment Date and (y) the date such Security is surrendered to the Company.

(ii) A Holder may elect to have its Securities purchased pursuant to a Company Change of Control Offer upon delivery of a written notice of purchase (the "Company Change of Control Purchase Notice") to the Company at any time prior to the close of business on the Company Change of Control Payment Date, stating:

(A) the certificate number of each Security which the Holder will deliver to be purchased; and

(B) the portion of the Principal Amount of such Security which the Holder has elected to have purchased.

(iii) Receipt of such Security by the Company prior to, on or after the Company Change of Control Payment Date shall be a condition to the

receipt by the Holder of the Company Change of Control Purchase Price therefor.

(iv) Provisions of this Security that apply to the purchase of all of a Security also apply to the purchase of any portion of such Security.

(v) Any purchase of Securities contemplated pursuant to this paragraph 4(b) shall be consummated by the delivery of the Company Change of Control Purchase Price to be received by the Holder one Business Day following the later of (x) the Company Change of Control Payment Date and (y) the date such Securities are surrendered to the Company.

(vi) If any Security is to be purchased only in part, the Company shall, without charge, issue to the Holder a new Security equal in Principal Amount to the unpurchased portion of such Security.

(vii) The Company will comply with the requirements of Section 14(e) under the Exchange Act and any other securities laws and regulations thereunder to the extent such laws and regulations are applicable in connection with the repurchase of the Securities pursuant to a Company Change of Control Offer. To the extent that the provisions of any securities laws or regulations conflict with the provisions of this paragraph 4(b), the Company shall comply with the applicable securities laws and regulations and shall not be deemed to have breached its obligations under this paragraph 4(b) by virtue thereof.

5. PURCHASE AT THE OPTION OF THE COMPANY UPON ELAN CHANGE OF CONTROL

(a) Upon a Change of Control of Elan occurring prior to November 9, 2001, the Company may, at its option, repurchase (the "Elan Change of Control Purchase") the Securities held by Elan or any of its Affiliates on the date of such Change of Control, in whole but not in part, at a cash purchase price per $1,000 Principal Amount (the "Elan Change of Control Purchase Price") equal to the greater of (i) the sum of (A) the Issue Price plus (B) accrued Original Issue Discount to the Elan Change of Control Payment Date (provided that if, prior to the Elan Change of Control Payment Date, the Securities have been converted to a semiannual coupon note following the occurrence of a Tax Event, the sum set forth in this clause (i) shall be the Restated Principal Amount plus interest accrued and unpaid from, and including, the date of such conversion to, but excluding, the Elan Change of Control Payment Date) and (ii) the product of (a) the number of shares of Common Stock into which the Securities to be redeemed may be converted pursuant to paragraph 6 hereof on the day immediately preceding the Elan Change of Control Payment Date and (b) the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to the Elan Change of Control Payment Date (as defined below); provided that, as a condition to any such repurchase, the Company shall repurchase all, but not less than all, of the Initial Shares, the Shares, the Conversion Shares and the License Shares, in each case, held by Elan and its Affiliates on the date of such Change of Control, pursuant to and in accordance with the terms of the Purchase Agreement.

(b) If an Elan Change of Control Purchase is to be made by the Company, the Company shall, on or prior to the 10th day following receipt of an Elan Change of Control Notice, cause an irrevocable notice of the Elan Change of Control Purchase (the "Elan Change of Control Purchase Notice") to be sent by first-class mail, postage prepaid, to Elan stating:

(i) that the Elan Change of Control Purchase is being made pursuant to this paragraph 5;

(ii) the Elan Change of Control Purchase Price and the purchase date (which shall be a Business Day no earlier than 10 days nor later than 20 days from the date of the Elan Change of Control Purchase Notice (the "Elan Change of Control Payment Date"));

(iii) that the Elan Change of Control Purchase Price for any Security as to which the Elan Change of Control Purchase Notice relates will be paid on the Business Day following the later of (x) the Elan Change of Control

Payment Date and (y) the date such Security is surrendered to the Company;

(iv) that Elan shall, and shall cause its Affiliates to, surrender to the Company on or prior to the Elan Change of Control Payment Date all Securities owned by any of them on the date of the Change of Control of Elan and the procedures to be followed in so surrendering such Securities; and

(v) that, unless the Company defaults in the payment of the Elan Change of Control Purchase Price, Original Issue Discount on all such Securities or interest, if any, will cease to accrue on and after the Elan Change of Control Payment Date and, effective upon the date of the Change of Control of Elan, such Securities shall cease to be convertible.

(c) In the event that the Company fails to deliver the Elan Change of Control Purchase Notice on or prior to the 10th day following receipt of an Elan Change of Control Notice pursuant to paragraph 5(b) hereof, such failure shall be deemed to be a waiver by the Company of its right to repurchase the Securities pursuant to this paragraph 5.

(d) Upon the giving of the Elan Change of Control Purchase Notice pursuant to this paragraph 5, such notice may not be revoked by the Company and all Securities as to which such Elan Change of Control Purchase Notice relates shall become due and payable in accordance with this paragraph 5 at the Elan Change of Control Purchase Price.

(e) Receipt of such Securities by the Company prior to, on or after the Elan Change of Control Payment Date shall be a condition to the receipt by the Holder of the Elan Change of Control Purchase Price therefor.

6. CONVERSION

(a) A Holder of a Security may, on or prior to November 9, 2008, convert in whole at any time or in part from time to time such Security into Common Stock; provided, however, that if a Security is called for redemption, the Holder may convert it at any time before the Redemption Date. A Security

in respect of which the Holder has delivered a Purchase Notice or a Company Change of Control Purchase Notice exercising the option of such Holder to require the Company to purchase such Security may, notwithstanding such notice, convert the Security in accordance with this paragraph 6 until the close of business on the Payment Date or the Company Change of Control Payment Date, as the case may be. Upon the occurrence of a Change of Control of Elan, the Securities then held by Elan and its Affiliates may not be converted on or prior to the 10th day following the giving of an Elan Change of Control Notice; provided that, if an Elan Change of Control Purchase Notice is given by the Company pursuant to paragraph 5(b) hereof, the Securities may not be converted unless the Company defaults in the payment of the Elan Change of Control Purchase Price for all Securities as to which such Elan Change of Control Purchase Notice relates. Notwithstanding the foregoing, neither Elan nor any of its Affiliates may convert any Security held by it if, at the time of such conversion, Elan is in violation of Section 14(c) of the Purchase Agreement.

(b) This Security shall be convertible into a number shares of Common Stock equal to (x) the Issue Price plus all accrued Original Issue Discount to the applicable Conversion Date (as defined below) (provided that if, prior to the applicable Conversion Date, the Securities have been converted to a semiannual coupon note following the occurrence of a Tax Event, this clause (x) shall be the Restated Principal Amount plus interest accrued and unpaid from, and including, the date of such conversion to, but excluding, such Conversion Date) divided by (y) $14.00, as adjusted to the Conversion Date (the "Conversion Price"). Provisions of this Security that apply to conversion of all of a Security also apply to conversion of a portion of such Security.

(c) The shares of Common Stock issuable upon conversion of this Security shall, to the extent required, bear the following legends:

THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), AND MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF AN EFFECTIVE

REGISTRATION STATEMENT UNDER THE ACT OR PURSUANT TO A VALID EXEMPTION THEREFROM. THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE

DISPOSED OF EXCEPT IN ACCORDANCE WITH THE PROVISIONS OF REGULATION S (SECTION 230.901 THROUGH SECTION 230.905, AND PRELIMINARY NOTES). HEDGING TRANSACTIONS INVOLVING THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE CONDUCTED UNLESS IN COMPLIANCE WITH THE ACT.

THE TRANSFER OF THE SHARES REPRESENTED BY THIS CERTIFICATE IS SUBJECT TO THE CONDITIONS SPECIFIED IN A SECURITIES PURCHASE AGREEMENT, DATED AS OF NOVEMBER 6, 1998, BY AND AMONG THE COMPANY, ELAN INTERNATIONAL SERVICES, LTD. AND ELAN CORPORATION, PLC, AND THE COMPANY RESERVES THE RIGHT TO REFUSE THE TRANSFER OF SUCH SHARES UNTIL SUCH CONDITIONS HAVE BEEN FULFILLED WITH RESPECT TO SUCH TRANSFER. A COPY OF SUCH CONDITIONS WILL BE FURNISHED BY THE COMPANY TO THE HOLDER HEREOF WITHOUT CHARGE.

(d) To convert this Security a Holder must (i) complete and duly sign a conversion notice in the form attached hereto as Annex B (the "Conversion Notice") and deliver such notice to the Company and (ii) surrender this Security to the Company. The date on which a Holder of Securities satisfies all the foregoing requirements is the conversion date (the "Conversion Date"). Not more than three Business Days after the Conversion Date, the Company shall deliver to the Holder a certificate for the number of full shares of Common Stock issuable upon such conversion and cash in lieu of any fractional share. The Person in whose name the certificate is registered shall be treated as a stockholder of record on and after the Conversion Date; provided, however, that no surrender of a Security on any date when the stock transfer books of the Company shall be closed shall be effective to constitute the Person or Persons entitled to receive the shares of Common Stock upon such conversion as the record holder or holders of such shares of Common Stock on such date, but such surrender shall be effective to constitute the Person or Persons entitled to receive such shares of Common Stock as the record holder or holders thereof for all purposes at the close of business on the next succeeding day on which such stock transfer books are open; such conversion shall be at the Conversion Price in effect on the date that such Security shall have been surrendered for conversion, as if the stock transfer books of the Company had not been closed. Upon conversion of a Security, such Person shall no

longer be a Holder of such Security. Any Security for which a Conversion Notice is delivered on any Business Day shall be deemed to be converted simultaneously with all other Securities for which a Conversion Notice is delivered on such Business Day, subject to the surrender of such Securities to the Company pursuant to this paragraph 6.

(e) If a Holder converts more than one Security at the same time, the number of shares of Common Stock issuable upon such conversion shall be based on the sum of (x) the aggregate Issue Price plus (y) the aggregate accrued Original Issue Discount, in each case, of the Securities converted; provided that if, prior to the applicable Conversion Date, the Securities have been converted to a semiannual coupon note following the occurrence of a Tax Event, such conversion shall be based on the sum of (x) the aggregate Restated Principal Amount plus (y) the aggregate interest accrued and unpaid from, and including, the date of such conversion to, but excluding, such Conversion Date. Upon surrender of a Security that is converted in part, the Company shall execute and deliver to the Holder a new Security in a denomination equal in Principal Amount to the unconverted portion of the Security surrendered. If the last day on which a Security may be converted is not a Business Day, such Security may be surrendered to the Company on the next succeeding Business Day.

(f) The Company shall not issue a fractional share of Common Stock upon conversion of a Security. Instead, the Company shall deliver cash in an amount equal to the current market value of the fractional share. The current market value of a fraction of a share shall be determined to the nearest 1/10,000th of a share by multiplying the average of the Closing Prices of the Common Stock for the 20 consecutive trading days immediately prior to the applicable Conversion Date by such fraction and rounding to the nearest whole cent, with one-half cent

being rounded upward.

(g) If a Holder converts a Security, the Company shall pay any documentary, stamp or similar issue or transfer tax due on the issue of shares of Common Stock upon such conversion.

(h) The Company shall reserve out of its authorized but unissued Common Stock a sufficient number of shares of Common Stock to permit the conversion of the Securities. All shares of Common Stock delivered upon conversion of the Securities shall be newly issued shares or treasury shares, shall be validly issued, nonassessable and fully paid, shall not be issued in violation of any preemptive or similar rights and shall be

free of any liens, encumbrances or restrictions on transfer imposed by the Company other than those imposed by the Securities Act and applicable state securities or "Blue Sky" laws. The Company shall cause all such reserved shares of Common Stock to be listed on the Nasdaq National Market or any other United States securities exchange or market where the Common Stock is principally traded.

(i) The Conversion Price shall be adjusted from time to time by the Company as follows:

(i) In case the Company shall, at any time or from time to time on or after the Issue Date, (A) pay a dividend or make a distribution on its Common Stock in shares of Common Stock, (B) subdivide its outstanding Common Stock into a greater number of shares, (B) combine its outstanding Common Stock into a smaller number of shares or (D) issue by reclassification of its Common Stock any other shares of its Capital Stock, then, in each such case, the Conversion Price in effect immediately prior to such action shall be adjusted so that the Holder of any Security thereafter surrendered for conversion shall be entitled to receive the number of shares of Common Stock or other Capital Stock of the Company which such Holder would have owned or have been entitled to receive after the happening of any of the events described above had such Security been converted immediately prior to the happening of such event. If any dividend or distribution of the type described in clause (A) above is not so paid or made, the Conversion Price shall again be adjusted to the Conversion Price which would then be in effect if such dividend or distribution had not been declared. An adjustment made pursuant to this paragraph 6(i)(i) shall become effective immediately after the record date in the case of a dividend or distribution and shall become effective immediately after the effective date in the case of subdivision, combination or reclassification. If, after an adjustment made pursuant to this paragraph 6(i)(i), the Holder of any Security thereafter converted shall become entitled to receive shares of two or more classes of Capital Stock of the Company, the board of directors of the Company shall determine the allocation of the adjusted Conversion Price between or among such classes of Capital Stock, which determination shall be final and binding on all Holders. After such allocation, the Conversion Price of each class of Capital Stock of the Company shall thereafter be subject to adjustment on terms comparable to those applicable to Common Stock in this paragraph 6(i).

(ii) if, at any time or from time to time on or after the Issue Date, the Company issues or sells any Common Stock for consideration in an amount per share less than the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to such issuance or sale, the Conversion Price shall be adjusted in accordance with the following formula:

$$E' = E \times \frac{0 + M}{A}$$

where:

E' = the adjusted Conversion Price.

E = the then current Conversion Price.

O = the number of shares of Common stock outstanding immediately prior to the issuance or sale of such additional shares of Common Stock.

P = the aggregate consideration received for the issuance or sale of such additional shares of Common Stock.

M = the average Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to the date of the issuance or sale of such additional shares of Common Stock.

A = the number of shares of Common Stock outstanding immediately after the issuance or sale of such additional shares of Common Stock.

The adjustments shall be made successively whenever any such issuance or sale is made, and shall become effective immediately after such issuance or sale.

This paragraph 6(i)(ii) does not apply to:

(A) the issuance of the License Shares pursuant to and in accordance with the License Agreement and the Purchase Agreement;

(B) the conversion of the Securities or the conversion, exercise or exchange of any other securities convertible into, or exercisable or exchangeable for, Common Stock;

(C) the issuance of Common Stock pursuant to a valid and binding written agreement with any Person, the terms of which provide that such Common Stock is to be issued on a date after the execution of such agreement and upon the occurrence of specified events (other than solely the passage of time);

(D) the issuance Common Stock to the shareholders of any Person which mergers into the Company or any Subsidiary of the Company in proportion to such shareholders' ownership of the securities of such Person, upon such merger; or

(E) Common Stock issued in a bona fide public offering pursuant to a firm commitment or "best efforts" underwriting.

(iii) if, at any time or from time to time on or after the Issue Date, the Company shall issue rights, options or warrants to all holders of its Common Stock entitling them (for a period expiring within 60 days after the record date mentioned below) to subscribe for or purchase shares of Common Stock at a price per share less than the greater of (x) the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to the record date and (y) the then current Conversion Price, the Conversion Price shall be adjusted in accordance with the following formula:

$$E' = E \times \frac{0 + \frac{N \times P}{M}}{0 + N}$$

where:

E' = the adjusted Conversion Price.

E = the then current Conversion Price.

O = the number of shares of Common Stock outstanding on the record date fixed for determination of

stockholders entitled to participate in such issuance.

N = the number of additional shares of Common Stock offered pursuant to such issuance.

P = the offering price per share of such additional shares of Common Stock.

M = the greater of (x) the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to the record date and (y) the then current Conversion Price.

The adjustment shall be made successively whenever any such issuance is made and shall become effective immediately after the record date fixed for the determination of stockholders entitled to participate in such issuance.

To the extent that shares of Common Stock are not delivered after the expiration of such rights, options or warrants, the Conversion Price shall be readjusted to the Conversion Price which would then be in effect had the adjustments made upon the issuance of such rights, options or warrants been made on the basis of delivery of only the number of shares of Common Stock actually delivered. If such rights, options or warrants are not so issued, the Conversion Price shall again be adjusted to be the Conversion Price which would then be in effect if the record date for the determination of stockholders entitled to participate in such distribution had not been fixed. In determining whether any rights, options or warrants entitle the Holders to subscribe for or purchase shares of Common Stock at a price per share less than the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately preceding the record date, and in determining the aggregate offering price of such shares of Common Stock, there shall be taken into account any consideration received by the Company for such rights, options or warrants, the value of such consideration, if other than cash, to be determined in good faith by the board of directors of the Company (irrespective of the accounting treatment thereof), which determination shall be final and binding on all Holders. Such determination shall be described in a board resolution. Notwithstanding the foregoing provisions of this paragraph 6(i)(iii), an

event which would otherwise give rise to an adjustment under this paragraph 6(i)(iii) shall not give rise to such an adjustment if the Company includes the Holders in such distribution on a pro rata basis as if each such Holder held the number of shares of Common Stock into which such Holder's Securities are convertible on the record date fixed for determination of the stockholders entitled to participate in such distribution and with the same notice as is provided to such stockholders.

This paragraph 6(i)(iii) does not apply to transactions described in paragraph 6(i)(iv).

(iv) If, at any time or from time to time on or after the Issue Date, the Company shall, by dividend or otherwise, distribute to all holders of its Common Stock any class of Capital Stock of the Company (other than Common Stock) or evidences of its indebtedness or assets (excluding cash dividends or other cash distributions from current or retained earnings other than any Extraordinary Cash Dividend) or rights, options or warrants to subscribe for or purchase any of the foregoing, the Conversion Price shall be adjusted in accordance with the following formula:

$$E' = \frac{E \times M - F}{M}$$

where

E' = the adjusted Conversion Price.

E = the then current Conversion Price.

M = the greater of (x) the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to the record date mentioned below and (y) the then current Conversion Price.

F = the fair market value on the record date fixed for determination of the stockholders entitled to participate in such distribution of the assets, securities, rights, options or warrants applicable to one share of Common stock. The board of directors shall determine such fair market value in good faith (irrespective of the

accounting treatment thereof), which determination shall be final and binding on the Holders. Such determination shall be described in a board resolution.

The adjustment shall be made successively whenever any such distribution is made and shall become effective immediately after the record date fixed for the determination of stockholders entitled to receive such distribution. To the extent that shares of Common Stock are not so delivered after the expiration of such rights, options, or warrants, the Conversion Price shall be readjusted to the Conversion Price which would then be in effect had the adjustment made upon the issuance of such rights, options or warrants been made on the basis of the delivery of only the number of shares of Common Stock actually delivered. Notwithstanding the foregoing provisions of this paragraph 6(i)(iv), an event which would otherwise give rise to an adjustment under this paragraph 6(i)(iv) shall not give rise to such an adjustment if the Company includes the Holders in such distribution on a pro rata basis as if each such Holder held the number of shares of Common Stock into which such Holder's Securities are convertible on the record date fixed for determination of the stockholders entitled to participate in such distribution and with the same notice as is provided to such stockholders.

This paragraph 6(i)(iv) does not apply to any transaction described in paragraph 6(i)(iii) hereof.

(v) If, at any time or from time to time on or after the Issue Date, the Company shall (x) enter into any valid and binding written agreement with any Person to issue or sell Common Stock on a date after the execution of such agreement and upon the occurrence of specified events (other than solely the passage of time) or (y) issue or sell any securities convertible into, or exercisable or exchangeable for, Common Stock, in each case, for consideration per share of Common Stock less than the average of the Closing Prices of the Common Stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to, in the case of clause (x), the date of execution of such agreement, and, in the case of clause (y), the date of such issuance or sale, the Conversion Price shall be adjusted in accordance with the following formula:

$$E' = E \times \frac{O + M}{O + \frac{P}{D}}$$

where:

E' = the adjusted Conversion Price.

E = the then current Conversion Price.

O = the number of shares of Common Stock outstanding immediately prior to, in the case of clause (x) above, the date of execution of such agreement, and, in the case of clause (y) above, the issuance or sale of such securities.

P = (a) in the case of clause (x) above, the minimum aggregate

amount of consideration payable to the Company upon the issuance or sale of such Common Stock (including the minimum aggregate amount of cash payments to be made by the Company to the other Person or Persons party to such agreement in lieu of which such Common Stock may be issued) and (b) in the case of clause (y) above, the aggregate consideration received for the issuance or sale of such securities plus the minimum aggregate amount of additional consideration, other than the surrender of such securities, payable to the Company upon conversion, exercise or exchange of such securities.

M = the Closing Prices of the Common stock for the 20 consecutive trading days ending on and including the second trading day immediately prior to, in the case of clause (x) above, the date of execution of such agreement, and, in the case of clause (y) above, the date of such issuance or sale.

D = the maximum stated number of shares deliverable pursuant to such agreement or upon conversion, exercise or exchange of such securities, as the case may be.

The adjustment shall be made successively whenever any such agreement is executed or such issuance or sale is made, and shall become effective immediately after the execution of such agreement or such issuance or sale.

If all of the Common Stock deliverable pursuant to any such agreement or upon conversion, exercise or exchange of such securities have not been issued upon the expiration or termination of such agreement or when such securities are no longer outstanding, as the case may be, then the Conversion Price shall be readjusted to the Conversion Price which would then be in effect had the adjustment made upon the execution of such agreement or the issuance or sale of such securities been made on the basis of the actual number of shares of Common Stock issued pursuant to such agreement or upon conversion, exercise or exchange of such securities.

This paragraph 6(i)(v) does not apply to:

(A) any stock options issued to employees and consultants (other than officers or directors) of the Company pursuant to any employee stock option or purchase plan or program approved by the board of directors of the Company;

(B) the issuance of the Securities; or

(C) any transaction described in paragraph 6(i)(iii) or (iv).

In the event of any change in the number of shares of Common Stock deliverable, or in the consideration payable to the Company, pursuant to any such agreement or upon the conversion, exercise or exchange of such securities, including, but not limited to, a change resulting from any anti-dilution provisions thereof, the Conversion Price shall, on the date of such change, be recomputed to reflect such change.

(vi) For purposes of any computation respecting consideration received pursuant to paragraph 6(i)(ii) and (v) hereof, the following shall apply:

(A) in the case of the issuance or sale of shares of Common Stock for cash, the consideration shall be the amount of such cash; provided that in no event shall any deduction be made for any commissions, discounts or other expenses incurred by the Company in connection therewith;

(B) in the case of the issuance or sale of shares of Common Stock for a consideration in whole or in part other than cash, the consideration other than cash shall be deemed to be the fair market value thereof as determined in good faith by the board of directors of the Company (irrespective of the accounting treatment thereof), which determination shall be final and binding on the Holders. Such determination shall be described in a board resolution; and

(C) in the case of any agreement referred to in clause (x) of paragraph 6(i)(v) hereof or the issuance or sale of securities referred to in clause (y) of paragraph 6(i)(v) hereof, the consideration, if any, to be received by the Company for the issuance or sale of Common Stock pursuant to such agreement or upon the conversion, exercise or exchange of such securities shall be determined in the same manner as provided in clauses (A) and (B) of this paragraph 6(i)(vi).

(vii) No adjustment in the Conversion Price need be made unless the adjustment would require a decrease of at least 1% in the Conversion Price then in effect; provided that any adjustment that would otherwise be required to be made shall be carried forward and taken into account in any subsequent adjustment. All calculations under this paragraph 6(i) shall be made to the nearest cent or to the nearest 1/10,000th of a share, as the case may be.

(viii) No adjustment need be made for rights to purchase Common Stock pursuant to a Company plan for reinvestment of dividends or interest. No adjustment need be made for a change in the par value or no par value of the Common Stock. To the extent that the Securities become convertible into cash, no adjustment need be made thereafter as to the amount of cash into which such Securities are convertible. Neither Original Issue Discount nor interest will accrue on cash.

(ix) Whenever the Conversion Price is adjusted, the Company shall promptly mail to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, a notice of the adjustment.

(x) In case:

(A) the Company shall take any action that would require an adjustment in the Conversion Price pursuant to paragraph 6(i)(i), (ii), (iii), (iv) or (v) hereof;

(B) of any event described in paragraph 6(i)(xi) hereof; or

(C) of the voluntary or involuntary dissolution, liquidation or winding-up of the Company;

the Company shall cause to be mailed to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, as promptly as possible but in any event at least 15 days prior to the applicable date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of any dividend or distribution or (y) the date on which any reclassification, consolidation, merger, sale, transfer, dissolution, liquidation or winding-up is expected to become effective or occur. Failure to give such notice, or any defect therein, shall not affect the legality or validity of such dividend, distribution, reclassification, consolidation, merger, sale, transfer, dissolution, liquidation or winding-up.

(xi) In the event of: (a) any reclassification or change of outstanding shares of Common Stock (other than a change in par value, or from par value to no par value, or from no par value to par value, or as a result of a subdivision or combination), (b) any consolidation or amalgamation with, or merger with or into, another Person as a result of which holders of Common Stock shall be entitled to receive cash, securities or other property with respect to or in exchange for such Common Stock or (c) any sale, transfer, assignment, lease, conveyance or other disposition of all or substantially all of the assets of the Company (in one transaction or series of related transactions) to any other Person as a result of which holders of Common Stock shall be entitled to receive cash, securities or other property with respect to or in exchange for such Common Stock, then the Company or the Person (if other than the Company) formed by such consolidation or amalgamation or into which the Company is merged or to which the properties and assets are sold, assigned, transferred, leased, conveyed or otherwise disposed of, as the case may be, shall expressly agree in writing, in form and substance satisfactory to a majority of Holders of Securities

then outstanding (excluding Securities then held by the Company or any of its Affiliates), that each Security shall be convertible into the kind and amount of securities, cash or other assets which the Holder of such Security would have owned immediately after such reclassification, change, consolidation, amalgamation, merger, sale, transfer, assignment, lease, conveyance or other disposition if such Holder had exercised such Security immediately before the record date or effective date, as the case may be, of the transaction. Such written agreement shall provide for adjustments which shall be as nearly equivalent as may be practicable to the adjustments provided for in this paragraph 6(i).

The Company shall cause notice of the execution of such written agreement to be mailed to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, within 20 days after execution thereof. Failure to deliver such notice shall not affect the legality or validity of such agreement.

The above provisions of this paragraph 7(i)(xi) shall similarly apply to successive reclassifications, changes, consolidations, amalgamations, mergers, sales, transfers, assignments leases, conveyances or other dispositions.

If this paragraph 6(i)(ix) applies to any event or occurrence, paragraph 6(i)(i), (ii), (iii), (iv) and (v) hereof shall not apply.

(xii) Rights or warrants distributed by the Company to all holders of Common Stock entitling the holders thereof to subscribe for or purchase shares of the Company's Capital Stock (either initially or under certain circumstances), which rights or warrants, until the occurrence of a specified event or events (each, a "Trigger Event"): (i) are deemed to be transferred with such shares of Common Stock, (ii) are not exercisable and (iii) are also issued in respect of future issuances of Common Stock, shall be deemed not to have been distributed for purposes of this paragraph 6(i) (and no adjustment to the Conversion Price under this paragraph 6(i) will be required) until the occurrence of the earliest Trigger Event, whereupon such rights and warrants shall be deemed to have been distributed and an appropriate adjustment (if any is required) to the Conversion Price shall be made under this paragraph 6(i). If any such right or warrant, including

any such existing rights or warrants distributed prior to the Issue Date, are subject to events, upon the occurrence of which such rights or warrants become exercisable to purchase different securities, evidences of indebtedness or other assets, then the date of the occurrence of any and each such event shall be deemed to be the date of distribution with respect to new rights or warrants with such rights (and a termination or expiration of the existing rights or warrants without exercise by any of the holders thereof). In addition, in the event of any distribution (or deemed distribution) of rights or warrants, or any Trigger Event or other event (of the type described in the preceding sentence) with respect thereto that was counted for purposes of calculating a distribution amount for which an adjustment to the Conversion Price under this paragraph 6(i) was made, (A) in the case of any such rights or warrants which shall have been redeemed or repurchased without exercise by any holders thereof, the Conversion Price shall be readjusted upon such final redemption or repurchase to give effect to such distribution or Trigger Event, as the case may be, as though it were a cash distribution, equal to the per share redemption or repurchase price received by a holder or holders of Common Stock with respect to such rights or warrants (assuming such holder had retained such rights or warrants), made to all holders of Common Stock as of the date of such redemption or repurchase and (B) in the case of such rights or warrants which shall have expired or been terminated without exercise by any holders thereof, the Conversion Price shall be readjusted as if such rights and warrants had not been issued. Notwithstanding the foregoing, no Holder shall be entitled to any adjustment in the Conversion Price of the Notes held by such Holder pursuant to this paragraph 6(i) if the applicable Trigger Event shall have been caused by the acquisition of securities of the Company by such Holder or any of its Affiliates.

(j) After an adjustment to the Conversion Price under paragraph 6(i), (ii), (iii), (iv) or (v) hereof, any subsequent event requiring an adjustment shall cause an adjustment to the Conversion Price as so adjusted.

(k) No adjustment shall be made pursuant to paragraph 6(i)(i), (ii), (iii), (iv) or (v) hereof if, as a result thereof, the Conversion Price would be increased.

7. COVENANTS

(a) Payment of Securities. The Company shall promptly make all payments in respect of the Securities on the dates and in the manner provided herein.

The Company shall, to the extent permitted by law, pay interest on overdue amounts at the rate set forth in paragraph 1 of the Securities, which interest on overdue amounts (to the extent that the payment of such interest shall be legally enforceable) shall accrue from the date such amounts became overdue.

(b) SEC Reports. The Company shall deliver to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, at the time the Company distributes them to the holders of its Common Stock, copies of its annual reports to shareholders and its proxy statements. In addition, the Company shall deliver to Elan, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, within 30 days after the Company files them with the SEC, copies of all other information, documents and reports (or copies of such portions of any of the foregoing as the SEC may by rules and regulations prescribe) which the Company is required to file with the SEC pursuant to Section 13 or 15(d) of the Exchange Act (or any successor provision thereof). In the event that the Company is at any time no longer subject to the reporting requirements of the Exchange Act (or any such successor provision), it shall deliver to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company, reports containing substantially the same information as would have been required to be filed with the SEC had the Company continued to have been subject to such reporting requirements, including, with respect to annual information only, a report thereon by the Company's certified independent public accountants as such would be required in such reports to the SEC and, in each case, together with a management's discussion and analysis of financial condition and results of operations as such would be so required. In such event, such reports shall be so delivered at the time the Company would have been required to provide such reports had it continued to have been subject to such reporting requirements.

(c) Compliance Certificates; Notice of Defaults.

(i) The Company shall deliver to each Holder, within 90 days after the end of each fiscal year, an Officers'

Certificate stating that a review of the activities of the Company and its Subsidiaries during such fiscal year has been made under the supervision of the signing Officers with a view to determining whether the Company has kept, observed, performed and fulfilled its obligations under the Securities, and further stating, as to each such Officer signing such certificate, that to the best of his or her knowledge, the Company has kept, observed, performed and fulfilled each and every covenant contained in the Securities and is not in default in the performance or observance of any of the terms, provisions and conditions contained in the Securities (or, if a Default or Event of Default shall have occurred, describing all such Defaults or Events of Default of which he or she may have knowledge and what action the Company is taking or proposes to take with respect thereto).

(ii) The Company shall, so long as any of the Securities are outstanding, deliver to each Holder, forthwith upon any Officer becoming aware of any Default or Event of Default, an Officers' Certificate specifying such Default or Event of Default and what action the Company is taking or proposes to take with respect thereto.

(d) Further Instruments and Acts. Upon request of the Holders of at least a majority in the aggregate Principal Amount of the outstanding Securities (excluding Securities at the time owed by the Company and its Affiliates), the Company will execute and deliver such further instruments and do such further

acts as may be reasonably necessary or proper to carry out more effectively the provisions of the Securities.

(e) Taxes. The Company shall, and shall cause each of its Subsidiaries to, pay prior to delinquency all material taxes, assessments and governmental levies, except as contested in good faith and by appropriate proceedings.

(f) Legal Existence. Subject to paragraph 8 hereof, the Company shall do or cause to be done all things necessary to preserve and keep in full force and effect its legal existence, and the corporate, partnership or other existence of each of its Subsidiaries, in accordance with their respective organizational documents (as the same may be amended from time to time) and the rights (charter and statutory), licenses and franchises of the Company and its Subsidiaries; provided that the Company shall not be required to preserve any such right, license or franchise, or the corporate, partnership or other existence of any of its Subsidiaries if the board of directors of the Com-

pany shall determine that the preservation thereof is no longer desirable in the conduct of the business of the Company and its Subsidiaries, taken as a whole.

(g) Withholding Taxes. All transfers of Securities by the Holders thereof and all payments made by the Company under or with respect to the Securities (including the issuance of securities upon the conversion of the Securities) shall be made free and clear of and without withholding or deduction for or on account of any present or future Taxes, unless the Company is required to withhold or deduct Taxes by law or by the interpretation or administration thereof. If the Company is required by law or by the interpretation or administration thereof to withhold or deduct any amount of Taxes in connection with the Securities, such amount shall be withheld and deducted by the Company without alteration of or increase in its obligations under the Securities; provided, however, that, if the Holder thereof has delivered to the Company a complete, manually-signed copy of Internal Revenue Service Form 1001 (or any successor form) or Internal Revenue Service Form 4224 (or any successor form) properly certifying to such Holder's entitlement to a complete exemption from U.S. withholding Tax with respect to such payment under applicable United States Treasury Regulations, such payment shall be made free and clear of and without withholding or deduction for or on account of any Taxes. In connection with any payment made by the Company under any Security which is made in whole or in part through the delivery of shares of Common Stock of the Company (including upon the conversion of the Securities), the amount required to be withheld or deducted shall first be withheld or deducted from the amount of cash (up to the total amount thereof) which would otherwise be paid at such time. Any additional amount required to be withheld or deducted, unless otherwise agreed by the Company and the Holder of a Security, shall be withheld and deducted by reducing the number of shares of Common Stock to be delivered by that number of shares of Common Stock equal to the remaining amount required to be withheld or deducted divided by the Conversion Price in effect on the date of such payment.

(h) Line of Business. The Company and its Subsidiaries will not engage in any businesses other than the business of researching, developing, marketing, selling, manufacturing, distributing or licensing pharmaceutical, medical, biologic, genetic or related products and services and financing activities related solely thereto, including the businesses in which the Company and its Subsidiaries are engaged on the Issue Date.

(i) Use of Proceeds. The Company will use the gross proceeds from the issuance of any Additional Notes in accordance with Section 1(b) of the Purchase Agreement and otherwise in accordance with the Purchase Request related thereto.

(j) Maintenance of Properties; Insurance; Books and Records; Compliance with Law.

(i) The Company shall, and shall cause each of its Subsidiaries to, at all times cause all material properties used or useful in the conduct of its business to be maintained and kept in good condition, repair and working order (reasonable wear and tear excepted) and supplied with all

necessary equipment, and shall cause to be made all necessary repairs, renewals, replacements, betterments and improvements thereto; provided that, subject to the other provisions of the Securities, nothing in this paragraph 7(j)(i) shall prevent the Company or any of its Subsidiaries from selling, abandoning or otherwise disposing of any property (including any lease of property) if in the judgment of the Company the same is no longer useful in the business of the Company or such Subsidiary, as the case may be.

(ii) The Company shall maintain, and shall cause to be maintained for each of its Subsidiaries, insurance covering such risks as are usually and customarily insured against by corporations similarly situated, in such amounts as shall be customary for corporations similarly situated and with such deductibles and by such methods as shall be customary and reasonably consistent with past practice.

(iii) The Company shall, and shall cause each of its Subsidiaries to, keep proper books of record and account, in which full and correct entries shall be made of all financial transactions and the assets and business of the Company and each Subsidiary of the Company, in accordance with U.S. generally accepted accounting principles consistently applied to the Company and its Subsidiaries, taken as a whole.

(iv) The Company shall, and shall cause each of its Subsidiaries to, comply with all statutes, laws, ordinances or government rules and regulations to which they are subject, non-compliance with which would materially adversely affect the business, prospects, earnings, prop-

erties, assets or financial condition of the Company and its Subsidiaries, taken as a whole.

8. SUCCESSOR CORPORATION

(a) The Company shall not consolidate with, amalgamate with, merge with or into, or sell, assign, transfer, lease, convey or otherwise dispose of all or substantially all of its assets (as an entirety or substantially as an entirety in one transaction or a series of related transactions), to any Person unless:

(i)(x) the Company shall be the continuing Person, or (y) the Person (if other than the Company) formed by such consolidation or amalgamation or into which the Company is merged or to which the properties and assets of the Company are sold, assigned, transferred, leased, conveyed or otherwise disposed of (in any case, the "Successor Company") shall be a corporation organized and existing under the laws of the United States or any State thereof or the District of Columbia and the Successor Company shall expressly affirm, in writing, the due and punctual performance of all of the terms, covenants, agreements and conditions of the Securities to be performed or observed by the Company, and such obligations shall remain in full force and effect; and

(i) immediately before and immediately after giving effect to such transaction, no Default or Event of Default shall have occurred and be continuing.

(b) In connection with any consolidation, amalgamation, merger or sale, assignment, transfer, lease, conveyance or other disposition of assets contemplated by this paragraph 8, prior to the consummation of such transaction or transactions the Company shall deliver, or cause to be delivered, to each Holder, by first-class mail, postage prepaid, at its address appearing in the register maintained by the Company, an Opinion of Counsel stating that (i) such consolidation, amalgamation, merger or sale, assignment, transfer, lease, conveyance or other disposition of assets complies with this paragraph 8, (ii) all conditions precedent herein provided for relating to such transaction or transactions have been complied with and (iii) the affirmation provided for in this paragraph 8 has been duly authorized, executed and delivered by the Successor Company and the Securities are valid and legally binding obligations of the Successor Company enforceable against it in accordance with their terms (subject to bankruptcy, insolvency, re-

organization and similar laws affecting the rights and remedies of creditors generally and general equitable principles).

(c) For purposes of paragraph 8(a) and (b) hereof, the transfer (by sale, assignment, lease, conveyance or other disposition, in a single transaction or series of related transactions) of all or substantially all of the properties or assets of one or more Subsidiaries of the Company, the Capital Stock of which constitutes all or substantially all of the properties and assets of the Company, shall be deemed to be the transfer of all or substantially all of the properties and assets of the Company.

(d) Upon any consolidation, amalgamation or merger, or any sale, assignment, transfer, lease, conveyance or other disposition of all or substantially all of the assets of the Company in accordance with this paragraph 8, the Successor Company shall succeed to, and be substituted for, and may exercise every right and power of, the Company under the Securities with the same effect as if such Successor Company had been named as the Company in the Securities, and thereafter the predecessor corporation shall be relieved of all obligations and covenants under the Securities.

9. DEFAULTS AND REMEDIES

(a) An "Event of Default" occurs if:

(i) after exercise of its option pursuant to paragraph 12 hereof following a Tax Event, the Company defaults in the payment of interest upon any Security or delivery of any Tax Event Option related thereto, when such interest becomes due and payable, and such default continues for a period of 30 days;

(ii) the Company defaults in the payment of the Principal Amount, Issue Price, accrued Original Issue Discount, Redemption Price, Purchase Price, Company Change of Control Purchase Price or Elan Change of Control Purchase Price on any Security when the same becomes due and payable at its Stated Maturity, upon redemption, upon declaration, when due for purchase by the Company or otherwise;

(iii) the Company defaults in the observance or performance of any agreement, covenant, term or condition contained in any Security (other than those referred to in clause (i) and (ii) above) and such failure continues for 30 days after receipt by the Company of notice thereof

(except in the case of a failure or default with respect to paragraph 8 hereof, which shall constitute an Event of Default with such notice requirement but without such passage of time requirement);

(iv) the Company defaults in any payment of principal of or interest on any other obligation for money borrowed or the Company fails to perform or observe any other agreement, covenant, term or condition contained in any agreement under which any such obligation is created and the effect of such default or failure is to cause, or the holder or holders of such obligation (or a trustee on behalf of such holder or holders), as a consequence of such default or failure shall take action to cause, such obligation to become due prior to any stated maturity thereof; provided that the aggregate amount of all obligations as to which such acceleration shall occur is equal to or greater than $4.0 million;

(v) any final judgment or judgments which can no longer be appealed for the payment of money in excess of $4.0 million (in excess of amounts covered by insurance and as to which the insurer has acknowledged coverage) shall be rendered against the Company or any Subsidiary thereof, and shall not be discharged for any period of 60 consecutive days during which a stay of enforcement shall not be in effect;

(vi) the Company or any Subsidiary thereof pursuant to or within the meaning of any Bankruptcy Law:

(A) commences a voluntary case,

(B) consents to the entry of an order for relief against it in an involuntary case,

(C) consents to the appointment of a Custodian of it or for all or substantially all of its property,

(D) makes a general assignment for the benefit of its creditors, or

(E) generally is not paying its debts as they become due;

(vii) a court of competent jurisdiction enters an order or decree under any Bankruptcy Law that:

(A) is for relief against either of the Company or any Subsidiary thereof in an involuntary case,

(B) appoints a Custodian of either of the Company or any Subsidiary thereof or for all or substantially all of the property of either of the Company or any Subsidiary thereof, or

(C) orders the liquidation of either of the Company or any Subsidiary thereof,

and the order or decree remains unstayed and in effect for 60 days; or

(viii) the Company fails to deliver shares of Common Stock (or cash in lieu of fractional shares) when such Common Stock (or cash in lieu of fractional shares) is required to be delivered, upon conversion of a Security and such failure is not remedied for a period of 10 days.

(b) If an Event of Default (other than an Event of Default specified in paragraph 9(a)(vi) or (vii) hereof occurs and is continuing, the Holders of at least 25% in aggregate Principal Amount of the Securities at the time outstanding (excluding Securities at the time owned by the Company and its Affiliates) by notice to the Company, may declare the Issue Price and accrued Original Issue Discount (or, if the Securities have been converted to a semiannual coupon note following a Tax Event, the Restated Principal Amount and accrued and unpaid interest) through the date of declaration on all the Securities to be immediately due and payable. Upon such a declaration, such Issue Price and accrued Original Issue Discount (or, if the Securities have been converted to a semiannual coupon note following a Tax Event, the Restated Principal Amount and accrued and unpaid interest) shall become and be due and payable immediately. If an Event of Default specified in paragraph 9(a)(vi) or (vii) hereof occurs and is continuing, the issue Price and accrued original Issue Discount (or, if the Securities have been converted to a semiannual coupon note following a Tax Event, the Restated Principal Amount and accrued and unpaid interest) on all the Securities shall become and be immediately due and payable without any declaration or other act on the part of any Holders. The Holders of a majority in aggregate Principal Amount of the Securities at the time outstanding (excluding Securities at the time owned by the Company and its Affiliates), by notice to the Company (and without notice to any other Holder), may rescind an acceleration and its consequences if the rescission would not conflict with any

judgment or decree and if all existing Events of Default have been cured or waived except nonpayment of the Issue Price and accrued Original Issue Discount (or accrued and unpaid interest) that have become due solely as a result of acceleration. No such rescission shall affect any subsequent or other Default or Event of Default or impair any consequent right.

(c) If an Event of Default occurs and is continuing, any Holder may pursue any available remedy to collect the payment of the Issue Price and accrued Original Issue Discount (or, if the Securities have been converted to a semiannual coupon note following a Tax Event, the Restated Principal Amount and

accrued and unpaid interest) on the Securities or to enforce the performance of any provision of the Securities.

A delay or omission by any Holder in exercising any right or remedy accruing upon an Event of Default shall not impair the right or remedy or constitute a waiver of, or acquiescence in, the Event of Default. No remedy is exclusive of any other remedy. All available remedies are cumulative.

(d) The Holders of a majority in aggregate Principal Amount of the Securities at the time outstanding (excluding Securities at the time owned by the Company and its Affiliates), by notice to the Company (and without notice to any other Holder), may waive an existing Default or Event of Default and its consequences except (i) an Event of Default described in paragraph 9(a)(i), (ii) or (viii) hereof or (ii) a Default in respect of a provision that under paragraph 11 hereof cannot be amended without the consent of each Holder affected. When a Default or Event of Default is waived, it is deemed cured, but no such waiver shall extend to any subsequent or other Default or Event of Default or impair any consequent right.

(e) Notwithstanding any other provision of the Securities, the right of any Holder to receive payment of the Principal Amount, Issue Price, accrued Original Issue Discount, Redemption Price, Purchase Price, Company Change of Control Purchase Price, Elan Change of Control Purchase Price or interest, if any, in respect of the Securities held by such Holder, on or after the respective due dates expressed in the Securities and to convert the Securities in accordance with paragraph 6 hereof, or to bring suit for the enforcement of any such payment on or after such respective dates or the right to convert the Securities, shall not be impaired or affected adversely without the consent of each such Holder.

(f) The Company covenants (to the extent it may lawfully do so) that it will not at any time insist upon, or plead, or in any manner whatsoever claim or take the benefit or advantage of, any stay or extension law or any usury or other law wherever enacted, now or at any time hereafter in force, which would prohibit or forgive the Company from paying all or any portion of the Principal Amount, Issue Price plus accrued Original Issue Discount, Redemption Price, Purchase Price, Company Change of Control Purchase Price or Elan Change of Control Purchase Price, in each case, in respect of Securities, or any interest on such amounts, as contemplated herein, or which may affect the covenants or the performance of the Securities; and the Company (to the extent it may lawfully do so) hereby expressly waives all benefit or advantage of any such law, and covenants that it will not hinder, delay or impede the execution of any power herein granted to the Holders, but will suffer and permit the execution of every power as though no such law had been enacted.

10. REGISTRATION, REGISTRATION OF TRANSFER AND EXCHANGE

(a) The Company shall cause to be kept at its offices a register in which the Company shall provide for the registration of Securities and of transfers of Securities. Upon surrender for registration of transfer of any Security, the Company shall execute, in the name of the designated transferee or transferees, one or more Securities of a like aggregate Principal Amount and bearing such restrictive legends as may be required by the terms of the Securities.

At the option of the Holder, and subject to the other provisions of the Securities, Securities may be exchanged for other Securities of a like aggregate Principal Amount, upon surrender of the Securities to be exchanged to the Company. Whenever any Securities are so surrendered for exchange, and subject to the other provisions of the Securities, the Company shall execute and deliver the Securities which the Holder making the exchange is entitled to receive. Every Security presented for registration of transfer or exchange shall be accompanied by the written instrument of transfer in the form attached hereto as Annex C, duly executed by the Holder thereof.

All Securities issued upon any registration of transfer or exchange of Securities shall be the valid obligations of the Company, evidencing the same debt, and subject to the same provisions as the Securities surrendered upon such registration of transfer or exchange.

Subject to paragraph 7(g) hereof and notwithstanding any other provision of this Section 10(a), no transfer of any Security shall be permitted, and no registration of transfer shall be effected unless, prior to the time of such transfer or registration of transfer, the Holder has made arrangements reasonably satisfactory to the Company for payment or reimbursement of any and all Taxes which would, in the absence of payment by the transferor, be required to be paid by the Company as a result of such transfer. No service charge shall be made for any registration of transfer or exchange. The Company acknowledges that Treasury Regulation Section 1.441-2(b)(3) (effective January 1, 1999) is not applicable to any Security issued prior to January 1, 1999.

In the event of a redemption of the Securities, the Company will not be required (i) to register the transfer of or exchange Securities for a period of 5 days immediately preceding the date notice of any redemption is given pursuant to paragraph 3(e) hereof or (ii) to register the transfer of or exchange any Security, or portion thereof, called for redemption.

(b) Except as permitted by this paragraph (b), each Security (and all Securities issued in exchange therefor or substitution thereof) shall, so long as appropriate, bear a legend (the "Legend") to substantially the following effect, (each, a "Transferred Restricted Security"):

THE SECURITY EVIDENCED HEREBY HAS NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT UNDER THE ACT OR PURSUANT TO A VALID EXEMPTION THEREFROM.

THE TRANSFER OF THE SECURITY EVIDENCED HEREBY IS SUBJECT TO THE CONDITIONS SPECIFIED IN A SECURITIES PURCHASE AGREEMENT, DATED AS OF NOVEMBER 6, 1998, BY AND AMONG THE COMPANY, ELAN INTERNATIONAL SERVICES, LTD. AND ELAN CORPORATION, PLC, AND THE COMPANY RESERVES THE RIGHT TO REFUSE THE TRANSFER OF SUCH SECURITY UNTIL SUCH CONDITIONS HAVE BEEN FULFILLED WITH RESPECT TO SUCH TRANSFER. A COPY OF SUCH CONDITIONS WILL BE FURNISHED BY THE COMPANY TO THE HOLDER HEREOF WITHOUT CHARGE.

At such time as any Transfer Restricted Security may be freely transferred without registration under the Securities Act and without being subject to transfer restrictions pursuant to the Securities Act, the Company shall permit the Holder of such Transfer Restricted Security to exchange such Transfer Restricted Security for a new Security which does not bear the applicable portion of the Legend upon receipt of certification from such Holder substantially in the form attached hereto as Annex D and, at the request of the Company, upon receipt of an opinion of counsel addressed to the Company that the transfer restrictions contained in the Legend are no longer applicable. In addition, at such time as such Security is no longer subject to the transfer conditions set forth in the Purchase Agreement, the Company shall permit the Holder of such Security to exchange such Security for a new Security which does not bear the portion of the Legend referring to such transfer conditions.

In addition to the Legend, until the expiration of the "one-year distribution compliance period" within the meaning of Rule 903 of Regulation S under the Securities Act, each Security (and all Securities issued in exchange therefor or substitution thereof) shall bear a legend (the "Reg. S Legend") to substantially the following effect:

THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF EXCEPT IN ACCORDANCE WITH THE PROVISIONS OF REGULATION S (SECTION 230.901 THROUGH SECTION 230.905, AND PRELIMINARY NOTES). HEDGING TRANSACTIONS INVOLVING THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE CONDUCTED UNLESS IN COMPLIANCE WITH THE ACT.

At the expiration of such "one-year distribution compliance period," the Company shall permit the Holder of such Security to exchange such Security for a new Security which does not bear the Reg. S Legend.

(c) If any mutilated Security is surrendered to the Company, the Company shall execute and deliver a new Security of like aggregate Principal Amount.

If there is delivered to the Company:

(i) evidence to its reasonable satisfaction of the destruction, loss or theft of any Security; and

(ii) such security or indemnity as may be reasonably satisfactory to the Company to save it harmless,

then, in the absence of actual notice to the Company that such Security has been acquired by a bona fide purchaser, the Company shall execute and deliver, in lieu of any such destroyed, lost or stolen Security, a new Security of like aggregate Principal Amount.

In case any such mutilated, destroyed, lost or stolen Security has become or is about to become due and payable, the Company, in its discretion, but subject to conversion rights, may, instead of issuing a new Security, pay such Security, upon satisfaction of the conditions set forth in the preceding paragraph.

11. AMENDMENTS AND WAIVERS

(a) Any term, covenant, agreement or condition of the Securities may, with the consent of the Company, be amended, or compliance therewith may be waived (either generally or in a particular instance and either retroactively or prospectively), by one or more substantially concurrent written instruments signed by the Holders of at least a majority in aggregate Principal Amount of the Securities at the time outstanding (excluding Securities at the time owned by the Company and its Affiliates); provided that, without the consent of each Holder affected, no such amendment or waiver, including a waiver pursuant to paragraph 9(d) hereof, shall:

(i) make any change in the Principal Amount of Securities whose Holders must consent to an amendment or waiver;

(ii) make any change to the manner or rate of accrual in connection with Original Issue Discount, reduce the interest rate referred to in paragraph 1 of the Securities, reduce the rate of interest referred to in paragraph 12 of the Securities upon the occurrence of a Tax Event or extend the time for payment of accrued Original Issue Discount or interest, if any, on any Security;

(iii) reduce the Principal Amount or the Issue Price of or extend the Stated Maturity of any Security;

(iv) reduce the Redemption Price, Purchase Price, Company Change of Control Purchase Price or Elan Change of Control Purchase Price or extend the date on which the Re-

demption Price, Purchase Price, Company Change of Control Purchase Price or Elan Change of Control Purchase Price of any Security is payable;

(v) make any Security payable in money or securities other than that stated in the Securities;

(vi) make any change in paragraph 9(d) hereof or this paragraph 11(a), except to increase any percentage referred to, or make any change in paragraph 9(e) hereof;

(vii) make any change that adversely affects the right to convert any Security (including the right to receive cash in lieu of fractional shares);

(viii) make any change that adversely affects the right to require the Company to purchase Securities in accordance with their terms; or

(ix) impair the right to institute suit for the enforcement of any payment with respect to, or conversion of, the Securities.

(b) No waiver shall extend to or affect any obligation not expressly waived or impair any right consequent thereto.

(c) The Company will not solicit, request or negotiate for or with respect to any proposed amendment or waiver of any provisions of any Security unless each Holder of Securities (irrespective of the amount of Securities then owned by it) shall be informed thereof by the Company and shall be afforded the opportunity of considering the same and shall be supplied by the Company with sufficient information to enable it to make an informed decision with respect thereto; provided, however, that preliminary discussions with one or more Holders regarding any such proposed amendment shall not constitute any such solicitation, request or negotiation. Executed or true copies of any amendment or waiver effected pursuant to this paragraph 11 shall be delivered by the Company to each Holder of Securities, by first class mail, postage prepaid, at its address appearing on the register maintained by the Company, forthwith following the date on which the same shall have been executed and delivered by the Holder or Holders of the requisite amount of outstanding Securities. The Company will not, directly or indirectly, pay or cause to be paid, remuneration, whether by way of fees or otherwise, to any Holder of Securities as consideration for or as an inducement to the entering into by such Holder of any amendment or waiver unless such remuneration is

concurrently paid, on the same terms, ratably to the Holders of all Securities then outstanding.

(d) Any amendment or waiver pursuant to this paragraph 11 shall (except as provided in paragraph 11(a)(i) through (ix) above) apply equally to all Holders and shall be binding upon them, upon each future Holder and upon the Company.

(e) in determining whether the Holders of the requisite amount of outstanding Securities have given any authorization, consent or waiver under this paragraph 11, Securities owned by the Company or any of its Affiliates shall be disregarded and deemed not to be outstanding.

12. TAX EVENT CONVERSION

(a) From and after the date (the "Tax Event Date") of the occurrence of a Tax Event, at the option of the Company, interest in lieu of future Original Issue Discount shall accrue at 8.0% per annum on a principal amount per Security (the "Restated Principal Amount") equal to the Issue Price plus accrued Original Issue Discount to the date immediately prior to the Tax Event Date or the date on which the Company exercises the option described in this paragraph 12(a), whichever is later (such date, the "Option Exercise Date"). Such interest shall accrue from the Option Exercise Date and shall be payable on November 9 and May 9 of each year (the "Interest Payment Date") to the Holders of record at the close of business on October 25 and April 24 (each, a "Regular Record Date") immediately preceding such Interest Payment Date. Interest will be computed on the basis of a 360-day year consisting of twelve 30-day months and will accrue from the most recent date on which interest has been paid or, if no interest has been paid, from the Option Exercise Date. Within 15 days of the occurrence of a Tax Event, the Company shall mail a written notice of such Tax Event to each Holder, by first-class mail, postage prepaid, at its address appearing on the register maintained by the Company.

(b) On each Interest Payment Date, concurrently with the payment of the interest due and payable on such date, the Company shall issue and deliver to each Holder of a Security to whom such interest is paid, an option (which option shall be in the form of a written instrument duly executed by the Company (a "Tax Event Option") to purchase a number of shares of Common Stock equal to the quotient obtained by dividing (x) the aggregate amount of such interest due and payable to such Holder on

such Interest Payment Date in respect of such Security by (y) the Conversion Price of such Security in effect on the Business Day immediately prior to such Interest Payment Date. Such Tax Event Option shall be exercisable, in whole at any time or in part from time to time, on or prior to November 9, 2008. Each Tax Event Option shall include provisions substantially similar to those set forth

in paragraph 6(c), (d), (e), (f), (g), (h) and (i) hereof. Each Tax Event Option shall be transferable by the holder thereof only together with the Security in respect of which such Tax Event Option was issued, subject to compliance with all applicable transfer restrictions of federal and state securities laws.

(c) Interest on any Security that is payable, and is punctually paid or duly provided for, on any Interest Payment Date shall be paid to the person in whose name that Security is registered at the close of business on the Regular Record Date for such interest. Each installment of interest on any Security shall be paid by wire transfer in immediately - available funds to an account designated in writing by the payee at least 2 Business Days prior to the Interest Payment Date applicable thereto.

(d) Subject to the foregoing provisions of this paragraph 12, each Security upon registration of transfer, or in exchange for or in lieu of any other Security, shall carry the rights to interest accrued and unpaid, and to accrue, which were carried by such other Security.

13. MISCELLANEOUS

(a) Any notices or other communications required or permitted hereunder shall be sufficiently given if delivered personally, sent by nationally recognized overnight delivery service or facsimile (receipt confirmed) or mailed by first-class mail, postage prepaid, addressed as follows:

(i) if to the Company, to:

Ligand Pharmaceuticals Incorporated
10275 Science Center Drive
San Diego, California 92121
Attn: General Counsel
Fax No.: (619) 550-1825

with a copy to:

Brobeck, Phleger & Harrison LLP

550 West C Street, Suite 1300
San Diego, California 92101-3532
Attn: Faye H. Russell, Esq.
Fax No.: (619) 234-3848

(ii) if to any Holder, at its address appearing in the register maintained by the Company pursuant to paragraph 10(a) hereof.

(iii) (x) on the date delivered, if delivered by facsimile or personally, (y) on the day after the notice is delivered into the possession and control of a nationally recognized overnight delivery service, duly marked for delivery to the receiving party or (z) three Business Days after being mailed by first-class mail, postage prepaid. The Company, by written notice to each of the Holders, may designate a different address for subsequent notices or communications.

(b) All agreements of the Company in this Security shall bind its successor.

(c) Each provision of this Security shall be considered separable and if for any reason any provision which is not essential to the effectuation of the basic purpose of this Security shall be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

(d) THIS SECURITY SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK, AS APPLIED TO CONTRACTS MADE AND PERFORMED WITHIN THE STATE OF NEW YORK, WITHOUT GIVING EFFECT TO THE PRINCIPLES OF CONFLICTS OF LAW TO THE EXTENT THAT THE APPLICATION OF LAWS OF ANOTHER JURISDICTION WOULD BE REQUIRED THEREBY.

(e) Upon conversion of this Security in accordance with the terms hereof, the Holder will be entitled to the benefits of the Registration Rights Agreement or the New Registration Rights Agreement, as the case may be, with respect to

the shares of Common Stock issuable to such Holder upon such conversion.

14. DEFINITIONS

"Accrual Increase", has the meaning specified in paragraph 1(c) hereof.

"Additional Amounts" has the meaning specified in paragraph 7(g) hereof.

"Affiliate" of any specified Person means any other Person directly or indirectly controlling or controlled by or under direct or indirect common control with such specified Person. For the purposes of this definition, "control," when used with respect to any specified Person means the power to direct or cause the direction of the management and policies of such Person, directly or indirectly, whether through the ownership of Voting Stock, by contract or otherwise; and the terms "controlling" and "controlled" have meanings correlative to the foregoing.

"Bankruptcy Law" means Title 11, U.S. Code or any similar federal or state law for the relief of debtors.

"Business Day" means each day of the year on which banking institutions are not required or authorized to close in The City of New York.

"Capital Stock" means, with respect to any Person, any and all shares, interests, participations or other equivalents (however designated and whether or not voting) of corporate stock, partnership interests or any other participation, right or other interest in the nature of an equity interest in such Person including, without limitation, common stock and preferred stock of such Person, or any option, warrant or other security convertible into any of the foregoing.

A "Change of Control" of any Person shall be deemed to have occurred at such time as (i) any other Person or group of related Persons for purposes of Section 13(d) of the Exchange Act ("Group") becomes the beneficial owner (as defined under Rule 13d-3 under the Exchange Act), directly or indirectly, of 50.0% or more of the total Voting Stock of such specified Person, (ii) there shall be consummated any consolidation or merger of such specified Person in which such specified Person is not the continuing or surviving corporation or pursuant to which the Voting Stock of such specified Person would be converted into cash, securities or other property, other than a merger or consolidation of such specified Person in which the holders of the Voting Stock of such specified Person outstanding immediately prior to the consolidation or merger hold, directly or indirectly, at least a majority of all Voting Stock of the continuing or surviving corporation immediately after such consolidation or merger or (iii) during any period of two consecutive years, individuals who at the beginning of such pe-

riod constituted the board of directors of such specified Person (together with any new directors whose election by such board of directors or whose nomination for election by the shareholders of such specified Person has been approved by a majority of the directors then still in office who either were directors at the beginning of such period or whose election or recommendation for election was previously so approved) cease to constitute a majority of the board of directors of such specified Person.

"close of business" means, with respect to any date, 5:00 PM, San Diego time, on such date, or such other city in which the Company's principal place of business may then be located.

"Closing Price" means, with respect to the Common Stock on any trading day, the last reported per share sales price of the Common Stock on such trading day, as reported by the Nasdaq National Market or, if the Common Stock is listed on a United States securities exchange, the closing per share sales price, regular way, on such trading day on the principal United States securities exchange on which the Common Stock is traded or, if no such sale takes place on such trading day, the average of the closing bid and asked prices on such day.

"Common Stock" means the common stock, par value $0.001 per share, of the Company, as such class exists on the date of this Security as originally executed or any other shares of Capital Stock into which such common stock shall be reclassified or changed.

"Company" means Ligand Pharmaceuticals Incorporated, a Delaware corporation.

"Company Change of Control Offer" has the meaning specified in paragraph 4(b) hereof.

"Company Change of Control Offer Notice" has the meaning specified in paragraph 4(b)(i) hereof.

"Company Change of Control Payment Date" has the meaning specified in paragraph 4(b)(i)(C) hereof.

"Company Change of Control Purchase Price" has the meaning specified in paragraph 4(b) hereof.

"Company Notice" has the meaning specified in paragraph 4(a)(v) hereof.

"Company Notice Date" has the meaning referred to in paragraph 4(a)(v) hereof .

"Conversion Date" has the meaning specified in paragraph 6(d) hereof.

"Conversion Notice" has the meaning specified in paragraph 6(d) hereof.

"Conversion Price" has the meaning specified in paragraph 6(b) hereof.

"Conversion Shares" has the meaning specified in the Purchase Agreement.

"Custodian" means any receiver, trustee, assignee, liquidator or similar official under any Bankruptcy Law.

"Default" means any event which is, or after notice or passage of time or both would be, an Event of Default.

"Distributed Securities" has the meaning specified in paragraph 6(i)(iv) hereof.

"Elan" means Elan Corporation, plc, a public limited company organized and existing under the laws of Ireland.

"Elan Change of Control Notice" has the meaning specified in the Purchase Agreement.

"Elan Change of Control Payment Date" has the meaning specified in paragraph 5(b)(ii) hereof.

"Elan Change of Control Purchase" has the meaning specified in paragraph 5(a) hereof.

"Elan Change of Control Purchase Notice" has the meaning specified in paragraph 5(b) hereof.

"Elan Change of Control Purchase Price" has the meaning specified in paragraph 5(a) hereof.

"Event of Default" has the meaning specified in paragraph 10(a).

"Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations of the SEC promulgated thereunder.

"Extraordinary Cash Dividend" means cash dividends with respect to the Common Stock the aggregate amount of which in any fiscal year exceeds the greater of (i) 10% of the consolidated net income of the Company for the fiscal

year immediately preceding the payment of such dividend and (ii) $200,000.

"Holder" means a Person in whose name this Security is registered on the books of the Company.

"Initial Shares" has the meaning specified in the Purchase Agreement.

"Interest Payment Date" has the meaning specified in paragraph 12(a) hereof.

"Issue Date" of this Security means the date on which this Security was originally issued or deemed issued as set forth on the face of this Security.

"Issue Price" of this Security means, in connection with the original issuance of this Security, the initial issue price at which this Security is issued as set forth on the face of this Security.

"Legend" has the meaning specified in paragraph 10(b) hereof.

"License Agreement" has the meaning specified in the Purchase Agreement.

"License Shares" has the meaning specified in the Purchase Agreement.

"Nasdaq National Market" means the electronic interdealer quotation system operated by Nasdaq Stock Market, Inc., a subsidiary of the National Association of Securities Dealers, Inc.

"New Registration Rights Agreement" has the meaning specified in the Purchase Agreement.

"Officer" means the Chief Executive Officer, the President, any Vice President, the Treasurer or the Secretary of the Company.

"Officers' Certificate" means a written certificate, signed in the name of the Company by (i) its Chief Executive

Officer, its President or any Vice President and (ii) its Treasurer or its Secretary.

"Opinion of Counsel" means a written opinion from legal counsel. The counsel may be an employee of, or counsel to, the Company or any Successor Company.

"Option Exercise Date" has the meaning specified in paragraph 12(a) hereof.

"Original Issue Discount" of this Security means the difference between the Issue Price and the Principal Amount of this Security as set forth on the face of this Security. For purposes of this Security, accrual of Original Issue Discount shall be calculated on a semi-annual bond equivalent basis using a 360 day year consisting of twelve 30-day months.

"Person" means any individual, corporation, partnership, limited liability company, joint venture, association, joint stock company, trust, unincorporated organization or government, or any agency or political subdivision thereof.

"Principal" or "Principal Amount" of this Security means the Principal Amount as set forth on the face of this Security.

"Purchase Agreement" has the meaning specified on the face of this Security.

"Purchase Date" has the meaning specified in paragraph 4(a) hereof.

"Purchase Notice" has the meaning specified in paragraph 4(a)(i) hereof.

"Purchase Price" has the meaning specified in paragraph 4(a) hereof.

"Purchase Request" has the meaning specified in the Purchase Agreement.

"Redemption Date" means a date specified for redemption of this Security

in accordance with the terms hereof.

"Redemption Price" has the meaning specified in paragraph 3(a) hereof.

"Registration Rights Agreement" has the meaning specified in the Purchase Agreement.

"Registration Rights Default" has the meaning specified in paragraph 1(c) hereof.

"Regular Record Date" has the meaning specified in paragraph 12(a) hereof.

"Restated Principal Amount" has the meaning specified in paragraph 12(a) hereof.

"SEC" means the Securities and Exchange Commission.

"Securities" means any of the Company's Zero Coupon Convertible Senior Notes due 2008, as amended and supplemented from time to time in accordance with the terms hereof, issued pursuant to the Purchase Agreement.

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations of the SEC promulgated thereunder.

"Shares" has the meaning specified in the Purchase Agreement.

"Stated Maturity" means November 9, 2008.

"Subsidiary" of any specified Person means any corporation, partnership, joint venture, limited liability company, association or other business entity, whether now existing or hereafter organized or acquired, (i) in the case of a corporation, of which more than 50% of the total voting power of the Capital Stock entitled (without regard to the occurrence of any contingency) to vote in the election of directors, officers or trustees thereof is held by such specified Person or any of its Subsidiaries or (ii) in the case of a partnership, joint venture, limited liability company, association or other business entity, with respect to which such specified Person or any of its Subsidiaries has the power to direct or cause the direction of the management and policies of such entity by contract or otherwise.

"Successor Company" has the meaning specified in paragraph 8 (a) (1) hereof.

"Tax Event" means that the Company shall have received an opinion from independent tax counsel experienced in such matters to the effect that, on or after the date of this Security, as a result of (a) any amendment to, or change (including any announced prospective change) in, the laws (or any regulations

thereunder) of the United Sates or any political subdivision or taxing authority thereof or therein or (b) any amendment to, or change in, an interpretation or application of such laws or regulations by any legislative body, court, governmental agency or regulatory authority, in each case, which amendment or change is enacted, promulgated, issued or announced or which interpretation is issued or announced or which action is taken, on or after the date of this Security, there is more than an insubstantial risk that interest (including Original Issue Discount) payable on the Securities either (i) would not be deductible on a current accrual basis or (ii) would not be deductible under any other method, in either case, in whole or in part, by the Company, by reason of deferral, disallowance or otherwise) for United States federal income tax purposes.

"Tax Event Date" has the meaning specified in paragraph 12(a) hereof.

"Tax Event Option" has the meaning specified in paragraph 12(b) hereof.

"Taxes" means any present or future tax, duty, levy, impost, assessment or other government charge (including penalties, interest and any other liabilities

related thereto) imposed or levied by or on behalf of any government or any political subdivision or territory or possession of any government or any authority or agency therein or thereof having power to tax.

"Transfer Restricted Security" has the meaning specified in paragraph 10(b) hereof.

"Voting Stock" means stock of any class or classes, however designated, having general voting power under ordinary circumstances to elect a majority of the board of directors, managers or trustees of a Person, other than stock having such power only by reason of the occurrence of a contingency.

ANNEX A

FORM OF PURCHASE NOTICE
OF
ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

Ligand Pharmaceuticals Incorporated
10275 Science Center Drive
San Diego, California 92121

Attention: General Counsel

1. Pursuant to the terms of the Zero Coupon Convertible Senior Note due 2008 (certificate no. [ ]in the Principal Amount of $[ ] (the "Security"), the undersigned hereby elects to cause Ligand Pharmaceuticals Incorporated (the "Company") to purchase $[ ] Principal Amount of the Security at the Purchase Price set forth in the Security on [November 9, 2002] [November 9, 2005], subject to the right of the undersigned to convert the Security at any time prior to the close of business on the Purchase Date. Capitalized terms used herein and not otherwise defined have the meanings specified in the Security.

2. In the event that the Security is purchased in part, please execute and deliver to the undersigned a new Security in a denomination equal in Principal Amount to the unpurchased portion of the Security.

3. In the event that the Company has elected to pay the Purchase Price with Common Stock (the "Shares") pursuant to paragraph 4(a)(iv) of the Security, the undersigned confirms that:

(a) We understand that the Shares have not been registered under the Securities Act and may not be offered or sold except as permitted in the following sentence. We agree that if we should sell or otherwise transfer the Shares, we will do so only (i) to the Company or its Subsidiaries, (ii) inside the United States to an institutional "accredited investor" (as defined below), (iii) outside the United States in accordance with Regulation S under the Securities Act, (iv) pursuant to the exemption from registration provided by Rule 144 under the Securities Act (if available) or (v) pursuant to an effective registration statement under the Securities Act.

(b) We understand that the certificates representing the Shares will, so long as appropriate, bear the following legends:

THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT") , MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT UNDER THE ACT OR PURSUANT TO A VALID EXEMPTION THEREFROM. THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF EXCEPT IN ACCORDANCE WITH THE PROVISIONS OF REGULATION S (SECTION 230.901 THROUGH SECTION 230.905, AND PRELIMINARY NOTES). HEDGING TRANSACTIONS INVOLVING THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE CONDUCTED UNLESS IN COMPLIANCE WITH THE ACT.

THE TRANSFER OF THE SECURITY EVIDENCED HEREBY IS SUBJECT TO THE

CONDITIONS SPECIFIED IN A SECURITIES PURCHASE AGREEMENT, DATED AS OF NOVEMBER 6, 1998, BY AND AMONG THE COMPANY, ELAN INTERNATIONAL SERVICES, LTD. AND ELAN CORPORATION, PLC, AND THE COMPANY RESERVES THE RIGHT TO REFUSE THE TRANSFER OF SUCH SECURITY UNTIL SUCH CONDITIONS HAVE BEEN FULFILLED WITH RESPECT TO SUCH TRANSFER. A COPY OF SUCH CONDITIONS WILL BE FURNISHED BY THE COMPANY TO THE HOLDER HEREOF WITHOUT CHARGE.

(c) We are acquiring the Shares for our own account and are either (i) an institutional "accredited investor" (as defined in Rule 501(a)(1), (2), (3) or (7) of Regulation D under the Securities Act) or (ii) a foreign purchaser that is outside the United States (as such terms are used under Regulations S under the Securities Act). We have such knowledge and experience in financial and business matters to be capable of evaluating the merits and risks of our investment in the Shares and we are able to bear the economic risk of our investment for an indefinite period of time.

This certificate and the statements contained herein are made for the benefit of the Company.

Signature of Holder

Date:

ANNEX B

CONVERSION NOTICE
OF
ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

Ligand Pharmaceuticals Incorporated
10275 Science Center Drive
San Diego, California 92121

Attention: General Counsel

1. Pursuant to the terms of the Zero Coupon Convertible Senior Note due 2008 (certificate no. [ ] in the Principal Amount of $[ ] attached hereto (the "Security"), the undersigned hereby elects to cause Ligand Pharmaceuticals Incorporated (the "Company") to convert $[ ] Principal Amount of the Security pursuant to paragraph 6 of the Security at the Conversion Price. Capitalized terms used herein and not otherwise defined have the meanings specified in the Security.

2. In the event that the undersigned has elected to convert the Security in part, please execute and deliver to the undersigned a new Security in a denomination equal in Principal Amount to the unconverted portion of the Security.

3. In connection with the conversion of the Security, the undersigned confirms that:

(a) We understand that the securities to be issued upon such conversion have not been registered under the Securities Act and may not be offered or sold except as permitted in the following sentence. We agree that if we should sell or otherwise transfer such securities, we will do so only (i) to the Company or its Subsidiaries, (ii) inside the United States to an institutional "accredited investor" (as defined below), (iii) outside the United States in accordance with Regulation S under the Securities Act, (iv) pursuant to the exemption from registration provided by Rule 144 under the Securities Act (if available) or (v) pursuant to an effective registration statement under the Securities Act.

(b) We understand that the certificates representing such securities will, so long as appropriate, bear the following legends:

THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES

ACT OF 1933, AS AMENDED (THE "ACT"), MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT UNDER THE ACT OR PURSUANT TO A VALID EXEMPTION THEREFROM. THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE SOLD, TRANSFERRED OR OTHERWISE DISPOSED OF EXCEPT IN ACCORDANCE WITH THE PROVISIONS OF REGULATION S (SECTION 230.901 THROUGH SECTION 230.905, AND PRELIMINARY NOTES). HEDGING TRANSACTIONS INVOLVING THE SHARES REPRESENTED BY THIS CERTIFICATE MAY NOT BE CONDUCTED UNLESS IN COMPLIANCE WITH THE ACT.

THE TRANSFER OF THE SECURITY EVIDENCED HEREBY IS SUBJECT TO THE CONDITIONS SPECIFIED IN A SECURITIES PURCHASE AGREEMENT, DATED AS OF NOVEMBER 6, 1998, BY AND AMONG THE COMPANY, ELAN INTERNATIONAL SERVICES, LTD. AND ELAN CORPORATION, PLC, AND THE COMPANY RESERVES THE RIGHT TO REFUSE THE TRANSFER OF SUCH SECURITY UNTIL SUCH CONDITIONS HAVE BEEN FULFILLED WITH RESPECT TO SUCH TRANSFER. A COPY OF SUCH CONDITIONS WILL BE FURNISHED BY THE COMPANY TO THE HOLDER HEREOF WITHOUT CHARGE.

(c) We are acquiring the securities to be issued upon conversion of the Security for our own account and are either (i) an institutional "accredited investor" (as defined in Rule 501(a)(1), (2), (3) or (7) of Regulation D under the Securities Act) or (ii) a foreign purchaser that is outside the United States. We have such knowledge and experience in financial and business matters to be capable of evaluating the merits and risks of our investment in the securities and we are able to bear the economic risk of our investment for an indefinite period of time.

This certificate and the statements contained herein are made for the benefit of the Company.

Signature of Holder

Date:

ANNEX C

FORM OF CERTIFICATE FOR
REGISTRATION OF TRANSFER
OR EXCHANGE
OF
ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

Ligand Pharmaceuticals Incorporated
10275 Science Center Drive
San Diego, California 92121

Attention: General Counsel

1. Reference is hereby made to the Zero Coupon Convertible Senior Note due 2008 (certificate no. [ ] in the Principal Amount of $[ ] attached hereto (the "Security"). Capitalized terms used herein and not otherwise defined have the meanings specified in the Security.

2. In connection with the registration of transfer or exchange of such Security, the undersigned hereby certifies that:

CHECK ONE

_____ The Security is being acquired for the undersigned's own account, without transfer; or

_____ The Security is being transferred to the Company; or

_____ The Security is being transferred in a transaction permitted by Rule 144 under the Securities Act; or

_____ The Security is being transferred pursuant to an effective registration statement; or

_____ The Security is being transferred in a transaction permitted by Rule 904 under the Securities Act; or

_____ The Security is being transferred pursuant to an exemption from the registration requirements of the Securities Act other than Rule 144 or Rule 904, and the undersigned hereby further certifies that the Security is being transferred in compliance with the exemption claimed, which certification is supported by an opinion of

counsel, if required by the Company, provided by the undersigned or the transferee (a copy of which the undersigned has attached to this certification) in form reasonably satisfactory to the Company, to the effect that such transfer is in compliance with the Securities Act;

and the Security is being transferred in compliance with any applicable state securities or "Blue Sky" laws of any state of the United States.

(3) This certificate and the statements contained herein are made for the benefit of the Company.

Signature of Holder

Date:

ANNEX D

FORM OF UNRESTRICTED SECURITIES CERTIFICATE
OF
ZERO COUPON CONVERTIBLE SENIOR NOTE DUE 2008

Ligand Pharmaceuticals Incorporated
10275 Science Center Drive
San Diego, California 92121

Attention: General Counsel

1. Reference is hereby made to the Zero Coupon Convertible Senior Note due 2008 (certificate no. [ ] in the Principal Amount of $[ ] attached hereto (the "Security"). Capitalized terms used herein and not otherwise defined have the meanings specified in the Security.

2. The undersigned, the registered owner of the Security, has requested that the Security be exchanged for a new Security bearing no portion of the Legend (excluding that portion of the Legend relating to transfer conditions set forth in the Purchase Agreement). In connection with such exchange, the undersigned hereby certifies that the exchange is occurring after a period of at least two years has elapsed since the date the Security was acquired from the Company or any affiliate (as such term is defined under Rule 144 under the Securities Act) of the Company, whichever is later, and the undersigned is not, and during the preceding three months has not been, an affiliate of the Company. The undersigned also acknowledges that future transfers of the Security must comply with all applicable state securities or "Blue Sky" laws.

3. This certificate and the statements contained herein are made for the benefit of the Company.

Signature of Holder

Date:

EXHIBIT 21.1

EXHIBIT 21.1 SUBSIDIARIES OF THE REGISTRANT

LIGAND PHARMACEUTICALS, INCORPORATED

LIST OF SUBSIDIARIES

<TABLE>
<CAPTION>

Name	Jurisdiction of Incorporation
<S>	<C>
Glycomed Incorporated	California
Ligand Pharmaceuticals, (Canada) Incorporated	Saskatchewan, Canada
Allergan Ligand Retinoid Therapeutics, Inc.	Delaware
Seragen Incoporated	Massachusetts

</TABLE>

EXHIBIT 23.1

CONSENT OF ERNST & YOUNG LLP, INDEPENDENT AUDITORS

We consent to the incorporation by reference in the Registration Statements on Forms S-3 and Forms S-8 of our report dated February 5, 1999 with respect to the consolidated financial statements of Ligand Pharmaceuticals Incorporated included in Ligand Pharmaceuticals Incorporated's Annual Report (Form 10-K) for the year ended December 31, 1998.

ERNST & YOUNG LLP

San Diego, California
March 26, 1999

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This schedule contains summary financial information extracted from SEC Form 10-K for the twelve months ended December 31, 1998 and is qualified in its entirety by reference to such financial statements. (in thousands except earnings per share)
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