NEOSE TECHNOLOGIES INC
Form 10-K
March 18, 2003

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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, 2002 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 Number 0-27718

NEOSE TECHNOLOGIES, INC.

(Exact name of registrant as specified in its charter)

Delaware	13-3549286
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
102 Witmer Road Horsham, Pennsylvania	19044 (Zip Code)
(Address of principal executive offices)	

Registrant's telephone number, including area code: (215) 315-9000

Securities registered pursuant to Section 12(b) of the Act:

None	None
(Title of each class)	(Name of each exchange on which registered)

Securities registered pursuant to Section 12(g) of the Act:

Preferred Share Purchase Rights
(Title of class)

Common Stock, par value $.01 per share
(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 the definitive proxy statement incorporated by reference in Part III of this Annual Report on Form 10-K or any amendment to this Annual Report on Form 10-K. [X]

Indicate by check mark whether the registrant is an accelerated filer (as defined in Rule 12b-2 of the Act). Yes [X] No [_]

As of June 28, 2002, the aggregate market value of the Common Stock held by non-affiliates of the registrant was approximately $120,010,330 based on the last sale price of the Common Stock as reported by the The Nasdaq Stock Market. This calculation excludes 3,286,707 shares held by directors, executive officers, and one holder of more than 10% of the registrant's Common Stock.

As of March 14, 2003, there were 17,207,766 shares of the registrant's Common Stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

None.

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PART IV

NEOSE, GlycoAdvance, GlycoPEGylation and GlycoConjugation are trademarks of Neose Technologies, Inc. This Annual Report on Form 10-K also includes trademarks and trade names of other companies.

This report includes "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements include, but are not limited to, statements about our plans, objectives, representations and contentions and are not historical facts, which typically may be identified by use of terms such as "anticipate," "believe," "estimate," "plan," "may," "expect," "intend," "could," "potential," and similar expressions, although some forward-looking statements are expressed differently. You should be aware that the forward-looking statements included in this report represent management's current judgment and expectations, but our actual results, events and performance could differ materially from those in the forward-looking statements. The forward looking statements are subject to a number of risks and uncertainties which are discussed in the section of Part II entitled "Factors Affecting the Company's Prospects." We do not intend to update any of these factors or to publicly announce the results of any revisions to these forward-looking statements.

PART I

ITEM 1. BUSINESS.

Overview

We are a biopharmaceutical company focused on improving glycoprotein therapeutics using our proprietary technologies. We are using our GlycoAdvance(TM), GlycoPEGylation(TM) and GlycoConjugation(TM) technologies to develop improved versions of currently marketed drugs with proven efficacy and to improve therapeutic profiles of glycoproteins in development for our partners. We expect these next generation proteins to offer significant advantages over drugs that are now on the market, potentially including less frequent dosing and improved safety and efficacy. In addition to developing our own products or co-developing products with others, we expect to enter into strategic partnerships for including our technologies into the product design and manufacturing processes of other biotechnology and pharmaceutical companies.

While our primary goal is protein drug development, our technologies offer multiple opportunities to participate in the evolving therapeutic protein market by addressing other challenges, such as manufacturing efficiency, manufacturing consistency, and the use of non-mammalian cell expression systems.

Glycoprotein Market

Proteins are molecules that are comprised of chains of amino acids, also called a polypeptides. Most commercially available protein therapeutics are glycoproteins, which have carbohydrate structures, or sugar chains, linked to the polypeptide backbone. Worldwide sales of glycoprotein drugs (which include monoclonal antibodies) were over $20 billion in 2001, and by some estimates are expected to grow to $80 billion by 2010. Many of the glycoproteins now on the market will lose the protection of certain patent claims over the next 15 years. We believe our GlycoAdvance, GlycoPEGylation and, potentially, GlycoConjugation technologies could be applied to many of these marketed drugs to create next generation products.

A growing number of glycoproteins are facing increased competition from other marketed drugs in their approved disease indications. This increased competition should generate demand for technologies that can improve and differentiate a therapeutic protein. We believe our GlycoAdvance, GlycoPEGylation and, possibly, GlycoConjugation technologies could be applied to drugs facing increased competition, thereby creating next generation products with improved clinical profiles. The same opportunity for the use of our technologies may also be found in their application to products in development that are going to enter a highly competitive market environment.

Core Technology

Our GlycoAdvance, GlycoPEGylation and emerging GlycoConjugation technologies evolve from the same core - the use of enzymes to complete and modify carbohydrate structures on glycoproteins. We have developed a special expertise and strong intellectual property position in this area. Our technologies may permit the development of new therapeutic proteins with improved clinical profiles. In many cases, these new therapeutic proteins will also give rise to new intellectual property. We continue to make significant investments in research and development and legal services to protect and expand our intellectual property position. We believe our core technology has broad application to protein drug development and can be extended to provide an opportunity for sustainable growth.

GlycoAdvance

Our GlycoAdvance technology uses enzymes to remodel or complete the sugar chains on glycoprotein drugs that lack complete carbohydrate structures, which is also called incomplete or incorrect glycosylation. Currently, recombinant glycoprotein drugs are most often produced in mammalian cell culture expression systems, primarily Chinese hamster ovary (CHO) cells. Carbohydrate chains, known as glycans, are added to proteins by the internal CHO cell glycosylation machinery. Proteins expressed in CHO cells, and many other expression systems used for commercial manufacturing, tend to produce carbohydrates on proteins that are described as incomplete because they lack one or more of the sugars typically found in glycoproteins of human tissues. Incompletely glycosylated proteins may be cleared more rapidly from the body, break down more rapidly, or stimulate unwanted antibody responses. Conventional approaches to improving glycosylation, such as changing expression cell types, re-engineering the protein, and modifying cell culture conditions or media, are

time consuming and frequently provide only partial solutions. Purification of incompletely glycosylated drug molecules from a drug product results in lower manufacturing yields.

GlycoAdvance technology employs recombinant glycosyltransferase enzymes to remodel or complete the glycan chains on glycoprotein drugs after they have been secreted by a cell expression system. Remodeling or completing sugar chains in this way has been shown to prolong half-life or enhance drug potency for several drug candidates in development. We are using GlycoAdvance to develop proprietary protein therapeutics and expect to partner with biotechnology and pharmaceutical companies that are developing or marketing glycoprotein drugs. We are also exploring the use of GlycoAdvance to enable alternative protein production systems, such as plants, insect cells, and yeast, that naturally produce only partial versions of glycan chains found in human glycoproteins.

GlycoPEGylation

Many glycoprotein drugs are smaller than the most abundant plasma proteins and are cleared much more rapidly from the circulation. Others tend to be subject to common protein drug delivery problems, such as poor solubility and stability, proteolytic degradation, short pharmacokinetic half-life and unwanted immunogenicity. For some proteins, covalent attachment of the large, water-soluble polymer, polyethylene glycol (PEG), to one or more amino acids has been shown to increase the effective size of the drug and improve solubility, stability, and half-life, while reducing the immunogenicity of the native protein. For many other protein drugs, however, it has been difficult to achieve these benefits by conventional PEGylation, because the amino acids that may serve as sites for attachment of PEG occur at positions in the polypeptide backbone where the bulky PEG blocks access to the protein's active site or alters the conformation of the protein, drastically diminishing drug activity.

GlycoPEGylation technology enables us to employ the selectivity of glycosyltransferase enzymes to link a simple sugar unit carrying preattached PEG to the ends of glycan chains on glycoprotein drugs. By specifically linking PEG to sugar chains that are remote from the protein's active site, GlycoPEGylation can preserve the bioactivity of the drug and extend its half-life. Starting with PEG-sugar nucleotide donors that bear PEGs of preselected sizes, we are able to enzymatically PEGylate a new or existing glycoprotein drug to create a family of molecular sizes that may be screened for optimal receptor binding and pharmacokinetic properties. We expect that significant clinical benefits may be achieved through the application of our GlycoPEGylation technology to proteins that have not been improved by traditional chemical PEGylation.

GlycoConjugation

Our emerging GlycoConjugation technology is a broader application of the enzymatic approach we use for GlycoPEGylation. However, instead of adding PEG to the glycoprotein to change its properties, we would add a different compound to achieve different therapeutic objectives. For example, some developers of monoclonal antibodies (MAbs) seek to achieve targeted therapeutic benefit by linking small molecules to their antibodies. Current methods for linking small molecule drugs to proteins, such as MAbs, generally employ chemistries that modify the protein backbone. These random chemical coupling processes frequently render some fraction of the protein molecules non-functional and result in a final product whose composition is highly variable and difficult to control.

GlycoConjugation should build upon our experience coupling PEG to sugar chains. Because of the well defined number of sites at which sugars can be added

enzymatically to any glycoprotein, GlycoConjugation may allow us to produce uniform drug conjugates with reproducible pharmaceutical properties. For MAbs that target cancer cells, GlycoConjugation can be designed to enable coupling of a defined number of toxin molecules or radionuclides per antibody molecule without interfering with antigen targeting activity. Experiments to explore these and other applications of this technology are ongoing.

Strategy

Primary Business Strategy

During 2002, we focused our business on the development of next-generation proprietary protein therapeutics, which we plan to pursue independently and in collaboration with selected partners. We generated internal data on potential proprietary drug candidates, and we continued to conduct research studies for biotechnology and pharmaceutical companies.

In January 2003, we announced the selection of an improved erythropoietin (EPO) as the target for our first proprietary drug development program. EPO is prescribed to stimulate production of red blood cells, and is approved for sale in major markets around the world for the treatment of anemia associated with oncology chemotherapy, end stage renal disease, and chronic renal insufficiency. EPO accounts for more sales worldwide than any other glycoprotein drug. Worldwide sales of EPO in 2001 were over $6 billion. Of this amount, approximately $4.5 billion in sales were in the U.S., $1.1 billion in sales were in Europe, and $0.6 billion in sales were in other markets, primarily in Asia. Based on preliminary laboratory data and animal studies, we believe it is feasible to develop a longer-acting EPO through GlycoPEGylation.

Our proof-of-concept studies conducted during 2002 suggest that the pharmacokinetic profile of EPO can be adjusted by manipulating the number of GlycoPEGylation sites and the molecular weight of the PEG that we attach to the compound. In these early studies, the biological activity of constructs of GlycoPEGylated EPO was comparable to the activity of unmodified EPO, or its longer acting analog. Based on our preliminary market research, we believe that clinicians, particulary oncologists, would favor a longer-acting erythropoietic protein over currently available formulations. This is supported by quantitative data for Amgen's longer acting darbapoietin (ARANESP(TM)) indicating first full year sales of greater than $400 million.

We believe that the expiration of key patents covering EPO will provide commercial opportunities in a time frame consistent with the development timeline of a new product. We expect to seek regulatory approval for EPO both in and outside the U.S In Europe, the key patents will expire in mid-decade. In the U.S., the patent situation surrounding EPO is more complex and the subject of ongoing litigation, making the time frame less predictable. We are planning to conduct various preclinical activities during 2003 and the first half of 2004, with the goal of initiating clinical trials in the second half of 2004. We plan to submit data from these trials to the appropriate government agencies for regulatory and marketing approval.

The process we have begun with erythropoietin will be expanded to other currently marketed proteins. We are generating internal data on other potential proprietary drug candidates, and we expect to select our second proprietary candidate in the second half of 2003.

We believe GlycoPEGylation has applicability to other proteins that are in early stage development or for which the threshold of patent expiration is too remote to consider the protein as a proprietary drug candidate. In these cases, we will pursue collaborations with the originating company to incorporate our technology in their protein development programs.

Business Development Initiatives

Our business development initiatives vary depending on the segment of our business model they support. In the case of proprietary proteins, our first objective is to assemble a portfolio of potential products and to partner them at various stages of development, with the goal of obtaining milestone payments and royalties from earlier products to fund the development of later products. In some cases, in order to retain more upside from the evolution of a product, we may co-develop the product, retaining commercial rights in some territories, thereby sharing the risks and rewards of product development with a partner.

In those cases where we are working on another company's protein, our business development approach involves a two-step process. In the first instance, we seek to enter into a funded research and development collaboration, in which our costs are funded and we have the opportunity to earn additional fees for technical success. Once the potential benefit of our technology to another company's protein is established in the initial step, we would begin the second phase of negotiations, with the goal of entering into a collaboration and license arrangement that recognizes the improvement in the product profile that we have demonstrated in the first step of the process. The initial step of this approach was incorporated into our negotiations with Novo Nordisk and Monsanto, which resulted in three research and development collaborations during 2002. We believe that this process will enable us and our partners to reflect the appropriate value of our technology in our license agreements, following the funded research and development collaborations.

Other Programs

During 2002, Wyeth decided to discontinue the clinical development of its recombinant PSGL-Ig (P-selectin glycoprotein ligand) after examination of Phase II results obtained with this protein, which did not yet incorporate our technology. As a result, Wyeth terminated our agreement to provide GlycoAdvance services and products in connection with Wyeth's recombinant PSGL-Ig. Wyeth's decision was unrelated to the performance of our GlycoAdvance technology, which had been intended to be used to subsequently produce recombinant PSGL-Ig for Phase III studies and commercial use.

Since we are now focused on developing next generation proprietary protein therapeutics, we are exploring the most effective means of continuing some of our other programs. These include our collaboration with Neuronyx, Inc. for the discovery and development of drugs for treating Parkinson's disease and other neurological diseases, our joint venture with McNeil Nutritionals (a subsidiary of Johnson & Johnson) to explore inexpensive, enzymatic production of complex carbohydrates for use as bulking agents, and our work with Wyeth Nutrition to develop a manufacturing process for a bioactive carbohydrate to be used as an ingredient in Wyeth's infant and pediatric nutritional products.

Intellectual Property

Strategy

Our success depends on our ability to protect and use our intellectual property rights in the continued development and application of our technologies, to operate without infringing the proprietary rights of others, and to prevent others from infringing on our proprietary rights. As we pursue our strategy of developing next generation products, we have increased our focus on investigating the patent protection for currently marketed proteins. We devote significant resources to obtaining, enforcing and maintaining patents,

although we recognize that the scope and validity of patents is never certain.

Our patent strategy is to increase our proprietary portfolio by continuing to seek patents for our technologies, including our proprietary reagents and enzymes, our proprietary methods, and products made using our technologies. We have filed applications for patents, have been granted patents, and have licensed rights relating to our technologies. We have continued to file patent applications covering new developments in our existing technologies and our new technologies, including GlycoPEGylation and GlycoConjugation, and the remodeling of a multitude of proteins.

In addition to developing our own intellectual property, we seek to obtain rights to complementary intellectual property from others. We have entered into license agreements with various institutions and individuals for certain patent rights, as well as sponsored research and option agreements for the creation and possible license to us of additional intellectual property rights. We are obligated to pay royalties at varying rates based upon, among other things, levels of revenues from the sale of licensed products under our existing license agreements, and we expect to pay royalties under new license agreements for intellectual property. Generally, these agreements continue for a specified number of years or as long as any licensed patents remain in force, unless the agreements are terminated earlier.

We also have certain proprietary trade secrets and know-how that are not patentable or which we have chosen to maintain as secret rather than filing for patent protection. We rely on certain security measures to protect our trade secrets, proprietary know-how, technologies and confidential information, and we continue to explore further methods of protection. We enter into confidentiality agreements with employees, consultants, licensees, and potential collaboration partners. These agreements generally require that all confidential information developed or made known by us to the other party during the relationship must be kept confidential and may not be disclosed to third parties, except in specific circumstances. Our agreements with employees and consultants also provide that inventions conceived by the individual in the course of rendering services to us will be our exclusive property.

Patents and Proprietary Rights

We own 26 issued U.S. patents, and have licensed 63 issued U.S. patents from 15 institutions. In addition, we own or have licensed over 81 patent applications pending in the U.S. There are also 393 foreign patent applications pending or granted related to our owned and licensed patents. In addition, we had three issued U.S. patents, one pending U.S. patent application and 34 granted or pending foreign counterparts, all of which have been assigned to Magnolia Nutritionals, our joint venture with McNeil Nutritionals (a subsidiary of Johnson & Johnson).

We have licensed, or have an option to license, patents and patent applications from the following institutions: University of California, The Scripps Research Institute, University of Pennsylvania, University of Michigan, Marukin Shoyu Co., Ltd., University of Arkansas, University of British Columbia, Rockefeller University, University of Alberta, Genencor International, GlycoZym Aps., Ghent University, National Research Council of Canada and University of Washington.

Government Regulation

Our research and development activities, the future manufacture of

reagents and products incorporating our technologies, and the marketing of these products are subject to regulation for safety and efficacy by numerous governmental authorities in the U.S. and other countries.

Regulation of Pharmaceutical Product Candidates

The research and development, clinical testing, manufacture and marketing of products using our technologies are subject to regulation by the U.S. Food and Drug Administration (FDA) and by comparable regulatory agencies in other countries. These national agencies and other federal, state and local entities regulate, among other things, research and development activities, and the manufacture, safety, effectiveness, labeling, storage, record keeping, approval, advertising and promotion of therapeutic products. Product development and approval within this regulatory framework take a number of years and involve the expenditure of substantial resources. We anticipate that the development of our next generation proprietary proteins will involve a traditional development program, including clinical trials.

In the U.S., after laboratory analysis and preclinical testing in animals, an investigational new drug application is required to be filed with the FDA before human testing may begin. Typically, a three-phase human clinical testing program is then undertaken. In Phase I, small clinical trials are conducted to determine the safety of the product. In Phase II, clinical trials are conducted to assess safety, establish an acceptable dose, and gain preliminary evidence of the efficacy of the product. In Phase III, clinical trials are conducted to obtain sufficient data to establish statistically significant proof of safety and efficacy. The time and expense required to perform this clinical testing vary

and can be substantial. No action may be taken to market any new drug or biologic product in the U.S. until an appropriate marketing application has been approved by the FDA. Even after initial FDA approval is obtained, further clinical trials may be required to provide additional data on safety and effectiveness, and will be required to gain clearance for the use of a product as a treatment for indications other than those initially approved. Side effects or adverse events that are reported during clinical trials may delay, impede, or prevent marketing approval. Similarly, adverse events that are reported after obtaining marketing approval may result in additional limitations being placed on the use of a product and, potentially, withdrawal of the product from the market.

The regulatory requirements and approval processes of countries in the European Union (EU) are similar to those in the U.S. In the EU, depending on the type of drug for which approval is sought, there are currently two potential tracks for marketing approval in member countries: mutual recognition and the centralized procedure. Typically, recombinant products are reviewed through the centralized procedure. The EU review mechanisms may ultimately lead to approval in all EU countries, but each method grants all participating countries some decision-making authority in product approval.

Sales of pharmaceutical and biopharmaceutical products in other areas of the world vary from country to country. Whether or not FDA licensure has been obtained, licensure of a product by comparable regulatory authorities in other countries must be obtained prior to marketing the product in those countries. The time required to obtain such licensure may be longer or shorter than that required for FDA approval, and we cannot assure that we or our collaborators will be able to obtain foreign approvals for any of our product candidates or products manufactured using our technologies.

In addition to regulating and auditing human clinical trials, the FDA regulates and inspects equipment, facilities, and processes used in the manufacture of products prior to providing approval to market a product. Among other conditions for marketing approval in the U.S., the prospective manufacturer's quality control and manufacturing procedures must conform on an ongoing basis with current Good Manufacturing Practices (cGMP). Before granting marketing approval, the FDA will perform a prelicensing inspection of the facility to determine its compliance with cGMP and other rules and regulations. In complying with cGMP, manufacturers must continue to expend time, money and effort in the area of production, training and quality control to ensure full compliance. After the establishment is licensed for the manufacture of any product, manufacturers are subject to periodic inspections by the FDA. If, as a result of FDA inspections relating to our products or reagents, the FDA determines that our equipment, facilities, or processes do not comply with applicable FDA regulations or conditions of product approval, the FDA may seek civil, criminal, or administrative sanctions and remedies against us, including the suspension of our manufacturing operations.

We expect to manufacture enzymes and sugar nucleotides for use by our potential GlycoAdvance and GlycoPEGylation customers, as well as for our own manufacturing use in the development of next generation proprietary protein therapeutics. Our partners may be responsible for clinical and regulatory approval procedures, but we would expect to participate in this process by submitting to the FDA a drug master file developed and maintained by us that contains data concerning the manufacturing processes for our enzymes and sugar nucleotides. Our ability to manufacture and sell enzymes and sugar nucleotides developed under contract depends upon completion of satisfactory clinical trials and success in obtaining marketing approvals.

Regulation of Other Products Manufactured Using Our Technologies

The development, manufacture, marketing, and sale of other products using our technologies also will be subject to regulatory review in the U.S. and other countries before commercialization. Generally foods and food ingredients are regulated less rigorously than pharmaceuticals. Infant formula ingredients are regulated as special types of food ingredients that are regulated more rigorously than most other types of food ingredients.

Other Regulations Affecting Our Business

We are subject to regulation by the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA), and the Nuclear Regulatory Commission (NRC), and to regulation under the Toxic Substances Control Act, the Resources Conservation and Recovery Act, and other regulatory statutes. Our research and development activities involve the controlled use of hazardous materials, chemicals, biological materials, and various radioactive compounds. We believe that our procedures comply with the standards prescribed by state and federal regulations, but we recognize that the risk of injury or accidental contamination cannot be completely eliminated. We voluntarily comply with the National Institutes of Health Guidelines for Research Involving Recombinant DNA Technologies.

We are also subject to the U.S. Foreign Corrupt Practices Act, which prohibits corporations and individuals from engaging in certain activities to obtain or retain business or to influence a person working in an official capacity. Our present and future business continues and will continue to be subject to various other U.S. and foreign laws and regulations. In addition, new

laws or regulations may be applicable to our research and development programs, and we cannot predict whether they would have a material adverse effect on our operations.

Third Party Reimbursement

Our ability and each of our collaborator's ability to successfully commercialize drug products may depend in part on the extent to which coverage and reimbursement for the cost of such products will be available from government health administration authorities, private health insurers, and other organizations. Uncertainty continues within the pharmaceutical and biotechnology industries as to the reimbursement status of new therapeutic products, and we cannot be sure that third-party reimbursement would be available for any therapeutic products that we or our collaborators might develop. Healthcare reform, especially as it relates to prescription drugs, is an area of increasing national attention and a priority of many governmental officials. Certain reforms, if adopted, could impose limitations on the prices we would be able to charge for our products, or the amount of reimbursement available for our products from governmental agencies or third-party payors.

Competition

The biotechnology and pharmaceutical industries are characterized by rapidly evolving technology and intense competition. Our competitors include pharmaceutical and biotechnology companies. In addition, many specialized biotechnology companies have formed collaborations with large, established companies to support research, development and commercialization of products that may be competitive with our current and future product candidates and technologies. Academic institutions, governmental agencies and other public and private research organizations are also conducting research activities and seeking patent protection and may commercialize products or technologies on their own or through joint ventures.

We are aware that other companies are working on the development of next generation protein therapeutics in anticipation of the expiration of certain patent claims covering marketed proteins. Specific companies such as Maxygen and Applied Molecular Evolution are using directed evolution techniques to manipulate protein structure and increase efficacy. Nektar and Enzon continue to utilize their traditional chemical pegylation technologies to increase the circulating half-life of certain proteins. Human Genome Sciences and BioRexis are now applying in-vivo fusion technologies using albumin and other carrier proteins to increase circulating half-life on specific proteins. In addition, drug delivery companies like Alkermes continue to exploit formulation technologies to improve administration and dosing of therapeutic proteins. Some of these companies have greater financial, technical, manufacturing, marketing and other resources than ours, and may be better equipped than we are to develop, market and manufacture these proteins. We cannot assure that any of our product candidates will be able to compete successfully against the products already established in the marketplace, or against new therapies that either may be developed by our competitors or may result from advances in biotechnology or other fields. In addition, our products may become subject to generic competition in the future.

Although a clear development and regulatory landscape does not currently exist for generic biologics in the U.S. and Europe, we are aware that companies are considering the opportunity to develop and commercialize

multisource versions of currently marketed products, including EPO. We continue

to expect that first generation, multisource biologic products will involve traditional process development, manufacturing and clinical development. Therefore, we expect that the cost of entry will be more significant than for classic small molecule generic products and will result in fewer multisource companies participating in the field, with less price erosion than one typically sees for small molecule generic equivalents.

There are a number of companies that have active programs focused on developing next generation or improved versions of EPO. Among them, companies such as Roche, Amgen, and Johnson & Johnson are actively engaged in EPO product improvement initiatives. Furthermore, non-originator companies are applying their technologies to develop improved EPO compounds. These include Gryphon, with their precision length polymer and chemical ligation technology, Transkaryotic Therapeutics, utilizing their gene activation technology, Human Genome Sciences, with their albumin fusion technology, and ARIAD, with their gene therapy and small molecule promoter technology. Other companies are active in this area, and we expect that competition will increase.

Although we are focused on the development of next generation protein therapeutics, we also use our GlycoAdvance and GlycoPEGylation technologies to provide collaborative research services and product improvement opportunities to other pharmaceutical and biotechnology companies. These services compete with internal efforts within these companies to improve therapeutic protein profiles and expression, and services provided by other companies to improve proteins, such as traditional PEGylation technology.

There are several companies that are engaged in glycobiology research. Their work includes efforts to develop better-glycosylating cell lines and optimizing cell culture conditions to improve glycosylation. Companies working in this area include Crucell, Glycart, and GlycoFi. Crucell has developed human cell lines for glycoprotein production. Glycart is pursuing the utilization of in vivo glycosylation of antibodies, and GlycoFi is focused on expressing glycoproteins in yeast systems.

Manufacturing

We have invested in the construction and validation of a manufacturing pilot plant in Horsham to support our business objectives. We have facilities to produce enzyme and sugar nucleotide reagents at scale to support our GlycoAdvance, GlycoPEGylation and GlycoConjugation technologies, and to assist in the production of our proprietary glycoprotein drugs and the glycoprotein drugs of collaborators. We continue to discover and develop improved reagents and technologies, and we will use our pilot plant to scale-up production of these reagents. Our facility is also expected to support the manufacture of modified forms of glycoprotein drugs as active pharmaceutical ingredients for use in clinical trials utilizing GlycoAdvance, GlycoPEGylation and GlycoConjugation technologies.

We intend to develop scalable processes to use our proprietary GlycoAdvance and GlycoPEGylation reagents to produce glycoproteins with improved properties. The reagents include donor sugars (sugar nucleotides) and enzymes (glycosyltransferases) that transfer the sugars onto the carbohydrate structures of glycoproteins. In our pilot plant, these reagents will be used in multiple combinations to selectively modify a glycoprotein under cGMP conditions, with the goal of producing a final active pharmaceutical ingredient. Depending on future supply requirements, we may employ one or more contract manufacturing organizations to manufacture our modified proteins or active pharmaceutical ingredients.

In 2002, we expanded our capabilities with the construction of a pilot manufacturing facility at our headquarters location for the production of enzymes and sugar nucleotides at commercial-scale in accordance with U.S. Food

and Drug Administration's Good Manufacturing Practices regulations. The facility consists of approximately 20,000 square feet of processing areas supported by 3,500 square feet of utility space. Separate areas are dedicated to sugar nucleotide processing, enzymes expressed in bacterial organisms, and enzymes expressed in fungal organisms.

The sugar nucleotide synthesis area has multiple process bays with reaction vessels up to 1,200 liter scale and is designed to handle the synthesis of carbohydrates using enzymes. Downstream processing can handle volumes up to 4,000 liters and consists of multiple suites with capability for filtration and chromatography. The bacterial fermentation area is designed to progressively scale an enzyme expression system from a 1 milliliter vial to a 1,500

liter batch. The area includes separate harvest and purification suites. The equipment is highly automated and controlled through a dedicated server. The fungal fermentation area has a similar layout and capacity to the bacterial area but is separated physically. It too has fermentation capacity up to 1,500 liters to produce enzymes expressed in fungal organisms. These suites are designed to allow flexibility in process scale and downstream processing needs.

Marketing, Distribution, and Sales of Proprietary Protein Products

We intend to capitalize on the significant experience and resources of our collaborative partners to commercialize proprietary products made using our technologies. These partners generally would be responsible for much of the development, regulatory approval, sales, marketing, and distribution activities for products incorporating our technologies. However, Neose intends to retain commercial rights to some proteins in select territories. If we commercialize any products on our own, we will have to establish or contract for regulatory, sales, marketing, and distribution capabilities, and we may have to supplement our development capabilities. The marketing, advertising, and promotion of any product manufactured using our technology would be subject to regulation by the FDA or other governmental agencies.

Employees

As of December 31, 2002, we employed 124 individuals, consisting of 79 employees engaged in research, development and manufacturing activities, 8 employees devoted to business development and licensing activities, and 37 employees devoted to corporate and administrative activities. Our scientific staff includes carbohydrate biochemists as well as scientists with expertise in organic chemistry, analytic chemistry, molecular biology, microbiology, cell biology, scale-up manufacture, and regulatory affairs. A significant number of our employees have prior experience with pharmaceutical or biotechnology companies, and many have specialized training in carbohydrate technology. None of our employees is covered by collective bargaining agreements. We believe we have good relations with our employees.

Internet Address and Securities Exchange Act Filings

Our internet address is www.neose.com. We make available through our website our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended. We make these reports and amendments available on our website as soon as practicable after filing them electronically with, or furnishing them to, the Securities and Exchange Commission.

EXECUTIVE OFFICERS OF THE COMPANY

The name, age as of March 14, 2003, and position of each of our executive officers are as follows:

C. Boyd Clarke, 54, has served on our Board and as our President and Chief Executive Officer since April 2002. From December 1999 to March 2002, Mr. Clarke was President and Chief Executive Officer of Aviron, a biotechnology company developing vaccines, which was acquired by MedImmune, and was also Chairman of Aviron from January 2001 to March 2002. From 1998 to 1999, Mr. Clarke was President and Chief Executive Officer of U.S. Bioscience, Inc., a biotechnology company focused on products to treat cancer, which also was acquired by MedImmune. Mr. Clarke served as President and Chief Operating Officer of U.S. Bioscience, Inc. from 1996 to 1998. From 1977 to 1996, Mr. Clarke held a number of positions at Merck & Co., Inc., including being the first President of Pasteur-Merieux MSD, and most recently as Vice President of Merck Vaccines. Mr. Clarke has a B.S. in biochemistry and an M.A. in history from the University of Calgary. Mr. Clarke also serves on the Board of Trustees of the Textile Museum in Washington, D.C.

David A. Zopf, M.D., 60, has served as our Executive Vice President since January 2002. He served as our Vice President, Drug Development from 1992 to January 2002. From 1991 to 1992, we engaged Dr. Zopf as a consultant on the biomedical applications of complex carbohydrates. From 1988 to 1991, Dr. Zopf served as Vice President and Chief Operating Officer of BioCarb, Inc., a biotechnology company and the U.S. subsidiary of BioCarb AB, where he managed the research and development programs of novel carbohydrate-based diagnostics and

therapeutics. Dr. Zopf received his A.B. in zoology from Washington University, and his M.D. from Washington University School of Medicine.

Robert I. Kriebel, 60, has served as our Senior Vice President and Chief Financial Officer since August 2002. From 1991 through 1999, he held various positions at U.S. Bioscience, Inc., most recently as Executive Vice President, Chief Financial Officer and Director. Prior to U.S. Bioscience, Mr. Kriebel held various positions with Rhone-Poulenc Rorer Inc. (formerly Rorer Group Inc.) from 1974 until November 1990. From 1987 to November 1990 he was Vice President and Controller of Armour Pharmaceutical Company, a subsidiary of Rorer Group Inc. In 1986, Mr. Kriebel was Vice President-Investor Relations of Rorer Group Inc. and from 1979 to 1985, he was Treasurer of Rorer Group Inc. Mr. Kriebel has a B.S. in economics from Roanoke College.

Debra J. Poul, Esq., 50, has served as our Senior Vice President and General Counsel since December 2002. From May 2002 to December 2002, she served as our Vice President and General Counsel, and from January 2000 until May 2002, she served as our General Counsel. From January 1995 to January 2000, Ms. Poul was Of Counsel at Morgan Lewis. From September 1978 to December 1994, Ms. Poul was at Dechert, serving as Counsel from 1989 to 1994. Ms. Poul received her B.A. from the University of Pennsylvania and her J.D. from Villanova University.

George J. Vergis, Ph.D., 42, has served as our Senior Vice President, Business and Commercial Development since December 2002. From July 2001 to December 2002, he served as our Vice President, Business and Commercial Development. From January 1996 to May 2001, Dr. Vergis served as Vice President, New Product Development and Commercialization at Knoll Pharmaceutical Company, a division of BASF Pharma, responsible for the commercial planning, product development, and marketing for the immunology franchise. Prior to this position,

Dr. Vergis was responsible for managing the endocrine business for BASF Pharma's Knoll Pharmaceutical Division. Dr. Vergis has held a variety of clinical and medical marketing positions at Wyeth Pharmaceuticals and Warner-Lambert Parke-Davis. Dr. Vergis received his BA in biology and history from Princeton University, his Ph.D. in physiology from The Pennsylvania State University, and his M.B.A. from Columbia University.

Joseph J. Villafranca, Ph.D., 58, has served as our Senior Vice President, Pharmaceutical Development and Operations since October 2002. From 1992 to 2002, he held various positions at Bristol-Myers Squibb, serving most recently as Vice President of Biologics Strategy and Biopharmaceuticals Operations. Prior to Bristol-Myers, Dr. Villafranca spent 20 years at The Pennsylvania State University, including eight years as the Evan Pugh Professor of Chemistry. Dr. Villafranca earned a B.S. in chemistry from the State University of New York and a Ph.D. in biochemistry/chemistry from Purdue University. He completed his post-doctoral training in biophysics at the Institute for Cancer Research in Philadelphia.

A. Brian Davis, 36, has served as our Vice President, Finance since August 2002. From 1994 until August 2002, Mr. Davis served in a variety of positions, most recently as Acting Chief Financial Officer and Senior Director, Finance. Mr. Davis is licensed as a Certified Public Accountant in New Jersey, and received his B.S. in accounting from Trenton State College. From 1991 to 1994, Mr. Davis was employed by MICRO HealthSystems, Inc., a provider of healthcare information systems, where he served most recently as Corporate Controller.

Marjorie A. Hurley, Pharm.D., 43, has served as Vice President, Regulatory Affairs and Project Management, since May 2002. She served as our Senior Director of Regulatory Affairs from January 2001 to May 2002, and as our Director of Regulatory Affairs from 1993-2000. From 1987 to 1993, Dr. Hurley served in various positions, including Assistant Director of Regulatory ffairs, at Cytogen Corporation, a biotechnology company. From 1984 to 1987, she held several positions, including Project Coordinator, at the Wyeth-Ayerst Laboratories division of American Home Products Corp. (now Wyeth). Dr. Hurley received her B.S. in pharmacy and her Pharm.D. from the University of Michigan.

ITEM 2. PROPERTIES.

We own, subject to a mortgage, approximately 50,000 square feet of cGMP manufacturing, laboratory, and corporate office space in Horsham, Pennsylvania, and we lease approximately 5,000 square feet of additional office and warehouse space in a building nearby. We lease approximately 10,000 square feet of laboratory and office space in San Diego, California. The initial term of the lease ends in March 2006, at which time we have an option to extend the lease for an additional five years.

In 2001 and 2002, we made capital expenditures of $17.4 million to provide additional cGMP manufacturing capacity in our Horsham, Pennsylvania facility. In 2002, we entered into a lease agreement for a 40,000 square foot building in Horsham, Pennsylvania, which we may convert into laboratory and office space. During 2002, we suspended plans to complete this conversion, and we have not yet made a final decision as to when or if we will resume this project. Approximately $4 million was expended as part of a $12 million renovation.

ITEM 3. LEGAL PROCEEDINGS.

We are not a party to any material legal proceedings.

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

We did not submit any matters to a vote of security holders during the fourth quarter of 2002.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY AND RELATED STOCKHOLDER MATTERS

Our common stock is listed on The Nasdaq Stock Market under the symbol NTEC. We commenced trading on The Nasdaq Stock Market on February 15, 1996. The following table sets forth the high and low sale prices of our common stock for the periods indicated.

	Common Stock Price	
	High	Low
Year Ended December 31, 2001		
First Quarter	$44.38	$22.38
Second Quarter	46.97	23.25
Third Quarter	47.42	30.15
Fourth Quarter	41.81	27.31
Year Ended December 31, 2002		
First Quarter	37.30	29.80
Second Quarter	32.58	9.07
Third Quarter	11.06	6.41
Fourth Quarter	14.00	5.90
Year Ended December 31, 2003		
First Quarter (through March 14, 2003)	9.31	6.03

As of March 14, 2003, there were approximately 200 record holders and 3,500 beneficial holders of our common stock. We have not paid any cash dividends on our common stock and we do not anticipate paying any in the foreseeable future.

Equity Compensation Plan Information

The following table gives information about our common stock that may be issued upon the exercise of options, warrants and rights under all of our existing equity compensation plans as of March 14, 2003.

Plan Category	Number of Securities to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	Number remaini future equit plans (ex reflected

Equity compensation plans approved by securityholders	4,171,865(1)	$17.14(1)
Equity compensation plans not approved by securityholders	499,186(2)	$31.62
Total	4,671,051	$18.65

(1) Does not include rights granted under the Employee Stock Purchase Plan. The next scheduled purchase date under the Employee Stock Purchase Plan is July 31, 2003, for which rights were granted in connection with the 24-month offering period that commenced in February 2002.
(2) Includes option grant to C. Boyd Clarke and option grants to two consultants, each as described in the text below.

Option Grants Under Plans Not Approved by Stockholders

On March 29, 2002, the Company's board of directors approved a grant to C. Boyd Clarke in connection with his appointment as President and Chief Executive officer of a non-qualified stock option to purchase 487,520 shares of common stock. The option grant to Mr. Clarke is not pursuant to the stock option plan and has not been submitted to, and is not required to be submitted to, the stockholders for approval. The option is exercisable for a period of ten years at a price of $32.05 per share, which was the fair market value of the underlying stock on the date of grant. The option is subject to a vesting schedule pursuant to which the options will vest and become exercisable with respect to 121,880 shares on March 29, 2003, and on a monthly basis thereafter such that the option will vest and become exercisable with respect to an aggregate of 93,750, 121,880, 121,880 and 28,130 shares in each of the remainder of 2003, 2004, 2005 and the first three months of 2006, respectively.

On December 6, 1995, the Company granted options to two consultants in connection with services provided to the Company. These options are now fully vested and exercisable at a price of $13.80 per share with respect to 8,333 shares for one consultant and 3,333 shares for the other. These options expire on December 6, 2005

ITEM 6. SELECTED FINANCIAL DATA.

The following Statements of Operations and Balance Sheet Data for the years ended December 31, 1998, 1999, 2000, 2001, and 2002, and for the period from inception (January 17, 1989) through December 31, 2002, are derived from our audited financial statements. The financial data set forth below should be read in conjunction with the sections of this Annual Report on Form 10-K entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations," and the financial statements and notes included elsewhere in this Form 10-K.

	Year ended December 31,				
	1998	1999	2000	2001	2002
	(in thousands, except per share data)				
Statements of Operations Data:					
Revenue from collaborative agreements	$ 390	$ 422	$ 4,600	$ 1,266	$ 4,813
Operating expenses:					
Research and development	9,912	10,649	12,094	14,727	18,879
Marketing, general and administrative	3,635	4,520	5,648	8,631	12,390
Severance	-	-	-	873	2,722
Total operating expenses	13,547	15,169	17,742	24,231	33,991
Other income	-	-	-	6,120	1,653
Interest income, net	1,250	1,429	4,642	3,516	1,108
Net loss	$(11,907)	$(13,318)	$(8,500)	$(13,329)	$(26,417)
Basic and diluted net loss per share	$ (1.25)	$ (1.25)	$ (0.63)	$ (0.95)	$ (1.85)
Weighted-average shares outstanding used in computing basic and diluted loss per share	9,556	10,678	13,428	14,032	14,259

	As of December 31,				
	1998	1999	2000	2001	2002
	(in thousands)				
Balance Sheet Data:					
Cash, cash equivalents and marketable securities	$ 32,023	$ 33,235	$ 94,762	$ 76,245	$ 41,040
Total assets	46,265	52,239	114,768	105,786	83,092
Long-term debt	8,300	7,300	6,200	5,100	5,560
Deficit accumulated during the development stage	(46,494)	(59,812)	(68,312)	(81,641)	(108,058)
Total stockholders' equity	36,013	40,785	104,868	93,946	70,685

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

The following discussion should be read in conjunction with our financial statements and related notes included in this Form 10-K.

Overview

We are a biopharmaceutical company focused on improving glycoprotein therapeutics using our proprietary technologies. We are using our GlycoAdvance(TM), GlycoPEGylation(TM) and GlycoConjugation(TM) technologies to develop improved versions of currently marketed drugs with proven efficacy and to improve therapeutic profiles of glycoproteins in development for our partners. We expect these next generation proteins to offer significant advantages over drugs that are now on the market, potentially including less frequent dosing and improved safety and efficacy. In addition to developing our own products or co-developing products with others, we expect to enter into strategic partnerships for including our technologies into the product design and manufacturing processes of other biotechnology and pharmaceutical companies. While our primary goal is protein drug development, our technologies offer multiple opportunities to participate in the evolving therapeutic protein market by addressing other challenges, such as manufacturing efficiency, manufacturing consistency, and the use of non-mammalian cell expression systems.

As of December 31, 2002, we had an accumulated deficit of approximately $108 million. We expect additional losses in 2003 and over the next several years as we expand product research and development efforts, increase manufacturing scale-up activities and, potentially, begin sales and marketing activities.

Application of Critical Accounting Policies

Our Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") focuses on our financial statements, which have been prepared in accordance with accounting principles generally accepted in the U.S. The preparation of financial statements requires management to make estimates and assumptions that affect the carrying amounts of assets and liabilities, and the reported amounts of revenues and expenses during the reporting period. These estimates and assumptions are developed and adjusted periodically by management based on historical experience and on various other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates.

Our summary of significant accounting policies is described in Note 2 to our financial statements included in Item 8 of this Form 10-K. Management considers the following policies to be the most critical in understanding the more complex judgments that are involved in preparing our financial statements and the uncertainties that could impact our results of operations, financial position, and cash flows.

Valuation of Long-Lived Assets

We evaluate our long-lived assets for impairment whenever indicators of impairment exist. Our history of negative operating cash flows is an indicator of impairment. Accounting standards require that if the sum of the future cash flows expected to result from a company's long-lived asset, undiscounted and without interest charges, is less than the reported value of the asset, an asset impairment must be recognized in the financial statements. The amount of the recognized impairment would be calculated by subtracting the fair value of the asset from the reported value of the asset.

Valuation of Acquired Intellectual Property

The carrying value of acquired intellectual property ("Acquired IP") on our balance sheet as of December 31, 2002 was $2.5 million. As of December 31,

2001 and 2002, our market capitalization exceeded the book value of our net assets by approximately $422 million and $53 million, respectively. Because most of our intellectual property portfolio is not reflected on our balance sheet, we believe the premium to book value reflected in our market

capitalization is largely due to the market's valuation of our intellectual property portfolio. As a result of the decline during 2002 in the premium to book value reflected in our market capitalization, we believed it was appropriate to review our acquired intellectual property ("Acquired IP") for impairment as of December 31, 2002. Since the undiscounted sum of the estimated future cash flows from the Acquired IP exceeded the carrying value, we have not recognized an impairment.

We believe that the accounting estimate related to asset impairment of our Acquired IP is a "critical accounting estimate" because:

- the accounting estimate is highly susceptible to change from period to period because it requires company management to estimate future cash flows over the life of our Acquired IP by making assumptions about the timing and probability of our success in:
  - entering into new collaborations; and
  - developing and commercializing products that incorporate our technologies, either directly or with collaborators; and
- the recognition of an impairment would have a material impact on the assets reported on our balance sheet as well as our net loss.

Management's assumptions underlying the estimate of cash flows require significant judgment because we have limited experience in entering into collaborations with others to develop products incorporating our technologies. In addition, we have limited experience in developing products incorporating our technologies and we have no experience in commercializing any products. Management has discussed the development and selection of this critical accouting estimate with the audit committee of our board of directors, and the audit committee has reviewed the company's disclosure relating to it in this MD&A.

In estimating the impact of future collaborations, we have made assumptions about the timing of entering into collaborations for potential products, most of which we are not yet developing. We have used data from public and private sources to estimate the types of cash flows that would occur at various stages of development for each product.

As of December 31, 2002, we estimate that our future cash flows, on an undiscounted basis, related to Acquired IP are greater than the current carrying value of the asset. Any decreases in estimated future cash flows could have an impact on the carrying value of the Acquired IP. If we had determined the Acquired IP to be fully impaired as of December 31, 2002, total assets would have been reduced by 3% and net loss would have been increased by 9%.

Valuation of Property and Equipment

Our property and equipment, which have a carrying value of $36.5 million as of December 31, 2002, have been recorded at cost and are being amortized on a straight-line basis over the estimated useful lives of those assets. Approximately $21.4 million of the carrying value represents the cost and, we believe, the fair value of construction-in-progress. We believe the

remaining property and equipment carrying value of $15.1 million does not exceed its fair value.

Of the $21.4 million of carrying value of construction-in-progress, approximately $4.0 million, was expended as part of a planned $12.0 million renovation to a leased facility. We have suspended plans to complete these renovations and we have not yet made a final decision as to when or if we will resume this project. To the extent that we determine that the partially completed renovations are of no future use to us, we would be required to recognize an impairment loss in our statement of operations. If we had determined this asset to be fully impaired as of December 31, 2002, total assets would have been reduced by 5% and net loss would have been increased by 15%. If we decide to resume the project, we anticipate expending an additional $8.0 million to restart the project and complete the renovations.

Valuation of Investment in Convertible Preferred Stock

In 2000, we made an investment of approximately $1.3 million in convertible preferred stock of Neuronyx, Inc. Our equity investment, which represents an ownership interest of less than 1%, was made on the same terms as

other unaffiliated investors. Accordingly, we recorded and carry our investment at cost. We will continue to evaluate the realizability of this investment and record, if necessary, appropriate impairments in value. No such impairments have occurred as of December 31, 2002. Future events could cause us to conclude that impairment indicators exist and the carrying value of our investment is impaired. If we had determined this investment to be fully impaired as of December 31, 2002, total assets would have been reduced by 2% and net loss would have been increased by 5%.

Revenue Recognition

Our revenue from collaborative agreements consists of up-front fees, research and development funding, and milestone payments. We recognize revenues from these agreements consistent with Staff Accounting Bulletin No. 101, "Revenue Recognition in Financial Statements" (SAB 101), issued by the Securities and Exchange Commission. Non-refundable up-front fees are deferred and amortized to revenue over the related performance period. We estimate our performance period based on the specific terms of each collaborative agreement, but the actual performance period may vary. We adjust the performance periods based on available facts and circumstances. Periodic payments for research and development activities are recognized over the period that we perform those activities under the terms of each agreement. Revenue resulting from the achievement of milestone events stipulated in the agreements is recognized when the milestone is achieved. Milestones are based on the occurrence of a substantive element specified in the contract or as a measure of substantive progress towards completion under the contract.

Stock-based Employee Compensation

We apply APB Opinion No. 25, "Accounting for Stock Issued to Employees" (APB 25), and related interpretations in accounting for all stock-based employee compensation. We record deferred compensation for option grants to employees for the amount, if any, by which the market price per share exceeds the exercise price per share. We amortize deferred compensation over the vesting periods of each option.

We have elected to adopt only the disclosure provisions of Statement of

Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation" (SFAS 123), as amended by Statement of Financial Accounting Standards No. 148, "Accounting for Stock-Based Compensation - Transition and Disclosure." The following table illustrates the effect on our net loss and basic and diluted net loss per share if we had recorded compensation expense for the estimated fair value of our stock-based employee compensation, consistent with SFAS 123 (in thousands, except per share data):

Year Ended December 31,	2000	2001	2
Net loss - as reported	$ (8,500)	$ (13,329)	$
Add: Stock-based employee compensation expense included in reported net loss	70	125	
Deduct: Total stock-based employee compensation expense determined under fair value-based method for all awards	(3,752)	(8,179)	
Net loss - pro forma	$ (12,182)	$ (21,383)	$
Basic and diluted net loss per share - as reported	$ (0.63)	$ (0.95)	$
Basic and diluted net loss per share - pro forma	$ (0.91)	$ (1.52)	$

Liquidity and Capital Resources

Overview

We have incurred operating losses each year since our inception. As of December 31, 2002, we had an accumulated deficit of approximately $108 million. We have financed our operations through private and public

offerings of our securities, and revenues from our collaborative agreements. We had approximately $41 million in cash, cash equivalents and marketable securities as of December 31, 2002, compared to approximately $76 million in cash and cash equivalents as of December 31, 2001. The decrease for 2002 was primarily attributable to the use of cash to fund our operating loss and capital expenditures.

In February 2003, we sold approximately 2.9 million shares of common stock in a private placement to a group of institutional and individual investors, generating net proceeds of approximately $16.3 million. We believe that our existing cash and marketable securities, expected revenue from collaborations and license arrangements, and interest income should be sufficient to meet our operating and capital requirements at least through the middle of 2004, although changes in our collaborative relationships or our business, whether or not initiated by us, may cause us to deplete our cash and marketable securities sooner than the above estimate. The timing and amount of our future capital requirements and the adequacy of available funds will depend on many factors, including if and when any products manufactured using our technology are commercialized.

During 2002, we focused our business on the development of next generation proprietary protein therapeutics, which we plan to pursue both independently and in collaboration with selected partners. This development and

commercialization will require substantial investments by us and our collaborators. Most of our 2002 revenues were derived from agreements that have been terminated or will conclude early in 2003. As a result, our 2003 revenues are difficult to project and will be largely dependent on entering into new collaborations and on the financial terms of any new collaborations. Other than revenues from any future collaborations, we expect to generate no significant revenues until such time as products incorporating our technologies are commercialized, which is not expected during the next several years. We expect an additional several years to elapse before we can expect to generate sufficient cash flow from operations to fund our operating and investing requirements. Accordingly, we will need to raise substantial additional funds to continue our business activities and fund our operations beyond the middle of 2004.

Capital Expenditures

During 2000, 2001, and 2002, we purchased approximately $1.5 million, $9.4 million, and $17.8 million, respectively, of property, equipment, and building improvements. The improvements during 2001 and 2002 consisted largely of the two following facility improvement projects:

- We completed construction in 2002 of a pilot manufacturing facility at our headquarters location for the production of enzymes and sugar nucleotides at commercial-scale in accordance with U.S. Food and Drug Administration's Good Manufacturing Practices regulations. The facility comprises approximately 20,000 square feet of processing areas and 3,500 square feet of utility space. It has bacterial and fungal fermentation capabilities and houses two 1,500 liter fermenters. We expended approximately $17.4 million for this project, of which approximately $8.2 million and $9.2 million were expended in 2001 and 2002, respectively.
- We entered into a lease agreement in 2002 for a 40,000 square foot building, which we intended to convert into laboratory and office space for an expected cost of approximately $12.0 million. Later in 2002, we suspended plans to complete these renovations and we have not yet made a final decision as to when or if we will resume this project. Our property and equipment at December 31, 2002 includes approximately $4.0 million in renovations to this facility. To the extent that we determine the partially completed renovations are of no future use to us, we would be required to recognize an impairment loss in our statement of operations. If we decide to resume the project, we anticipate expending an additional $8.0 million to restart the project and complete the renovations.

In 2003, we expect our investment in capital expenditures to be approximately $3.0 million to $5.0 million, which excludes the impact of resuming the facility renovations described above. We may finance some or all of these capital expenditures through the issuance of new debt or equity. If we issue new debt, we may be required to maintain a minimum cash and investments balance, or to transfer cash into an escrow account to collateralize some portion of the debt, or both.

Long-term Debt

Montgomery County (Pennsylvania) IDA Bonds

In 1997, we issued, through the Montgomery County (Pennsylvania) Industrial Development Authority, $9.4 million of taxable and tax-exempt bonds, of which $5.1 million remains outstanding as of December 31, 2002. The bonds were issued to finance the purchase of our headquarters building and the construction of a pilot-scale manufacturing facility within our building. The bonds are supported by an AA-rated letter of credit, and a reimbursement agreement between our bank and the letter of credit issuer. The interest rate on the bonds will vary weekly, depending on market rates for AA-rated taxable and tax-exempt obligations, respectively. During 2002, the weighted-average, effective interest rate was 3.3% per year, including letter-of-credit and other fees. The terms of the bond issuance provide for monthly, interest-only payments and a single repayment of principal at the end of the twenty-year life of the bonds. However, under our agreement with our bank, we are making monthly payments to an escrow account to provide for an annual prepayment of principal. As of December 31, 2002, we had restricted funds relating to the bonds of approximately $1.0 million, which consisted of our monthly payments to an escrow account plus interest revenue on the balance of the escrow account. During 2003, we will be required to make payments of $1.2 million into the escrow account.

To provide credit support for this arrangement, we have given a first mortgage on the land, building, improvements, and certain machinery and equipment to our bank. We have also agreed to maintain a minimum required cash and short-term investments balance of at least two times the outstanding loan balance. If we fail to comply with this requirement, we are required to deposit with the lender cash collateral up to, but not more than, the loan's unpaid balance. At December 31, 2002, we were required to maintain $10.2 million of cash and short-term investments.

Equipment Loan

In December 2002, we borrowed approximately $2.3 million to finance the purchase of equipment, which is collateralizing the amount borrowed. The terms of the financing require us to pay monthly principal and interest payments over 36 months at an interest rate of 8%. During 2003, we will be required to make payments totalling approximately $0.8 million under this agreement.

Capital Lease Obligation

In November 2002, we entered into a capital lease to lease $50,000 of equipment. The terms of the lease require us to make monthly payments of $1,561 over 36 months. During 2003, we will be required to make payments totalling $19,000 under this agreement.

Summary of Contractual Obligations

In addition to entering into the equipment lease financing described above, we entered into an operating lease agreement during 2002 for a 40,000 square foot building in Horsham, Pennsylvania. Our aggregate rental obligation over the 20-year lease term is approximately $9.9 million. The following table summarizes our obligations to make future payments under current contracts:

	Payments due by perio	
Total	Less than 1 Year	1 - 3 Years

Long-term debt/1/	$ 7,361,000	$1,835,000	$2,856,000
Capital lease obligation/2/	50,000	16,000	34,000
Operating leases/3/	10,865,000	761,000	1,538,000
Purchase obligations/4/	832,000	634,000	194,000
Other long-term liabilities reflected on our balance sheet under GAAP/5/	451,000	185,000	170,000
Total contractual obligations	$ 19,559,000	$3,431,000	$4,792,000

1. See "Long-term debt" in this Liquidity and Capital Resources section for a description of the material features of our long-term debt.
2. See "Capital Lease Obligation" in this Liquidity and Capital Resources section for a description of the material features of our capital lease obligation.
3. See Note 13 of the Notes to Financial Statements included in this Form 10-K for a description of our significant operating leases. The obligations presented in this table include $64,000 of deferred rent, which is included in the Other Liabilities section of our Balance Sheet.
4. Includes our commitments as of December 31, 2002 to purchase goods and services.
5. Represents the present value as of December 31, 2002 of the remaining payments under agreements with two former employees. The agreement relating to one of the employees will terminate in March 2003. Prior to the termination, the employee may agree to extend his non-competition and non-solicitation commitments for two additional years by entering into a separate non-competition agreement. If he does so, we will continue his medical benefits for an additional six months, extend his monthly payment of $39,622 for 24 additional months, and continue his stock option vesting and exercisability during the additional two-year period. This contingent commitment is not reflected in the above table or on our balance sheet as of December 31, 2002. These agreements are described in Note 11 of the Notes to Financial Statements included in this Form 10-K.

Other Factors Affecting Liquidity

Wyeth Pharmaceuticals

In December 2001, we entered into a research, development and license agreement with Wyeth Pharmaceuticals, a division of Wyeth, for the use of our GlycoAdvance technology to develop an improved production process for Wyeth's biopharmaceutical compound, recombinant PSGL-Ig (P-selectin glycoprotein ligand), which was in Phase II clinical trials. In May 2002, we learned of Wyeth's decision to discontinue the development of rPSGL-Ig for the treatment of myocardial infarction based on Phase II results. Their decision was unrelated to the performance of our GlycoAdvance technology, which was to have been incorporated for Phase III and commercial production. Wyeth subsequently notified us of the termination of the agreement, effective September 2002. During 2002, we recognized approximately $3.8 million of revenue from this agreement. We expect to receive no further revenues from this collaboration.

Joint Venture with McNeil Nutritionals

We have a joint venture with McNeil Nutritionals to develop bulking agents for use in the food industry. We account for our investment in the joint venture under the equity method, under which we recognize our share of the income and losses of the joint venture. In 1999, we reduced the carrying value

of our initial investment in the joint venture of approximately $345,000 to zero to reflect our share of the joint venture's losses. We recorded this amount

as research and development expense in our statements of operations. We will record our share of post-1999 losses of the joint venture, however, only to the extent of our actual or committed investment in the joint venture.

The joint venture developed a process for making fructooligosaccharides and constructed a pilot facility in Athens, Georgia. In 2001, the joint venture closed the pilot facility and is exploring establishing a manufacturing arrangement with a third party to produce this or other bulking agents. As a result, we do not intend to commit the joint venture to make any further investments in facilities.

During the years ended December 31, 2000, 2001, and 2002, we supplied to the joint venture research and development services and supplies, which cost approximately $1.6 million, $0.8 million, and $252,000, respectively, which were reimbursed to us by the joint venture. These amounts have been reflected as a reduction of research and development expense in our statements of operations. As of December 31, 2002, the joint venture owed us $16,000. We expect to provide fewer research and development services during 2003 compared to 2002, thereby reducing our expected reimbursement from the joint venture.

If the joint venture becomes profitable, we will recognize our share of the joint venture's profits only after the amount of our capital contributions to the joint venture is equivalent to our share of the joint venture's accumulated losses. As of December 31, 2002, the joint venture had an accumulated loss since inception of approximately $10.2 million. Until the joint venture is profitable, McNeil Nutritionals is required to fund, as a non-recourse, no-interest loan to the joint venture, all of the joint venture's capital expenditures in excess of an agreed-upon amount, and all of the joint venture's operating losses. The loan balance would be repayable by the joint venture to McNeil Nutritionals over a seven-year period commencing on the earlier of September 30, 2006 or the date on which Neose attains a 50% ownership interest in the joint venture after having had a lesser ownership interest. In the event of any dissolution of the joint venture, the loan balance would be payable to McNeil Nutritionals by the joint venture before any distribution of assets to us. As of December 31, 2002, the joint venture owed McNeil Nutritionals approximately $8.5 million.

Off-Balance Sheet Arrangements

We are not involved in any off-balance sheet arrangements that have or are reasonably likely to have a material future effect on our financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures, or capital resources.

Results of Operations

Years Ended December 31, 2002 and 2001 and Outlook for 2003

Our net loss for the year ended December 31, 2002 was approximately $26.4 million compared to approximately $13.3 million for the corresponding period in 2001. The following section explains the trends within each component of net loss for 2002 compared to 2001 and provides our estimate of trends for 2003 for each component.

Revenue from Collaborative Agreements. Revenues from collaborative

agreements increased to approximately $4.8 million in 2002 from approximately $1.3 million in 2001. The increase in revenues during 2002 was primarily a result of our Wyeth Pharmaceuticals collaboration, which was terminated in the third quarter of 2002. Of the increase, $1.0 million was non-cash, and represented the remaining amortization of the up-front fee that Wyeth paid in December 2001. As required under SAB 101, we deferred the up-front fee and began to amortize this amount as revenue over the expected performance period of the Wyeth agreement. Upon termination of the Wyeth agreement, the unamortized portion of the up-front fee was recognized as revenue.

Most of our 2002 revenues were derived from agreements that have been terminated or will conclude early in 2003. As a result, our 2003 revenues are difficult to project and are largely dependent on entering into new collaborations and on the financial terms of any new collaborations.

Research and Development Expense. Research and development expenses for the year ended December 31, 2002 were approximately $18.9 million, compared to approximately $14.7 million for the year ended December 31,

2001. The increase was primarily attributable to increases in the number of employees as well as increased laboratory supplies and service expenses.

In January 2003, we announced the selection of an improved erythropoietin as our first proprietary candidate for development. We are planning to conduct various preclinical activities during 2003 and the first half of 2004, with the goal of beginning clinical trials in the second half of 2004. In addition, we intend to generate internal data on other potential proprietary drug candidates, and we expect to announce our second proprietary candidate for development in the second half of 2003. As a result of these activities, we expect our 2003 research and development expenses to be significantly greater than they were in 2002.

Marketing, General and Administrative Expense. Marketing, general and administrative expenses for the year ended December 31, 2002 were approximately $12.4 million, compared to approximately $8.6 million for the corresponding period in 2001. The 2002 period contained higher personnel costs (including payroll, recruiting, and relocation), legal, and consulting expenses than the comparable 2001 period, which increases resulted primarily from recruiting of senior executives and focusing our business on the development of next generation proprietary protein therapeutics. During 2003, we expect our marketing, general and administrative expenses to increase by less than 10% over 2002.

Severance Expense. During the year ended December 31, 2002, we incurred severance expense of approximately $2.7 million compared to approximately $0.9 million for the year ended December 31, 2001. Of the $2.7 million incurred in 2002, approximately $1.6 million is a non-cash charge related to stock option modifications for an agreement entered into with one of our officers in connection with his retirement. We have no current plans to incur severance expenses during 2003.

Other Income and Expense. During the year ended December 31, 2002, we recognized approximately $1.7 million of other income upon receipt from Genzyme General of a contract payment, which was due as a result of the restructuring of our agreement with Novazyme Pharmaceuticals, Inc. in March 2001. In September 2001, Genzyme acquired Novazyme, and assumed Novazyme's contractual obligation to us. We do not expect to recognize any additional other income during 2003.

Interest income for the year ended December 31, 2002 was approximately $1.1 million, compared to approximately $3.7 million for the corresponding period in 2001. The decrease was due to lower average cash and cash equivalents and marketable securities balances, as well as lower interest rates, during 2002. Our interest income during 2003 is difficult to project, and will depend largely on prevailing interest rates and whether we complete any collaborative agreements and any additional equity or debt financings during the year.

Interest expense for the year ended December 31, 2002 was zero, compared to $188,000 for the corresponding period in 2001. The decrease was due to the fact that in 2002 we capitalized $150,000 of interest expense on our two capital construction projects, as discussed in the Liquidity and Capital Resources section of this MD&A. In accordance with GAAP, we recognized capitalized interest for these projects only to the extent of our actual interest expense, resulting in no reported interest expense for 2002. Our interest expense during 2003 is difficult to project, and will depend largely on prevailing interest rates and whether we complete any additional debt financings, and whether we decide to resume and complete the facility renovations described in the Liquidity and Capital Resources section of this MD&A.

Years Ended December 31, 2001 and 2000

Our net loss for the year ended December 31, 2001 was approximately $13.3 million compared to approximately $8.5 million for the corresponding period in 2000. The following section explains the trends within each component of net loss for 2001 compared to 2000.

Revenue from Collaborative Agreements. Revenues from collaborative agreements decreased to approximately $1.3 million in 2001 from approximately $4.6 million in 2000. Substantially all of our revenues during 2001 were payments received by us under our collaborative agreement with Wyeth Nutrition.

Research and Development Expense. Research and development expenses increased to approximately $14.7 million in 2001 from approximately $12.1 million in 2000. The increase was primarily attributable to the addition of

new employees in 2001 and the expenses associated with our San Diego facility, which we began leasing in April 2001. In addition, our joint venture with McNeil Nutritionals reimbursed Neose approximately $0.8 million in 2001, which was approximately $0.8 million less than in 2000, for the cost of research and development services and supplies provided to the joint venture. The reimbursement amounts have been reflected as a reduction of research and development expense in our statements of operations for 2000 and 2001.

Marketing, General and Administrative Expense. Marketing, general and administrative expenses increased to approximately $8.6 million in 2001 from $5.6 million in 2000. The increase was primarily attributable to the hiring of additional business development personnel, increased expenses for marketing GlycoAdvance, and increased legal and filing expenses associated with our growing patent portfolio.

Severance Expense. During the year ended December 31, 2001, we incurred severance expense of approximately $0.9 million, which included non-cash charges of approximately $0.8 million related to stock option modifications in connection with the separation of employees from Neose.

Other Income and Expense. We realized a gain of approximately $6.1

million in 2001 from the sale of shares of Genzyme General common stock, which we received as a result of Genzyme's acquisition of Novazyme Pharmaceuticals, Inc. in September 2001. Interest income decreased to approximately $3.7 million in 2001 from approximately $5.1 million in 2000 due to lower average cash and marketable securities balances and lower interest rates during 2001. Interest expense decreased to $188,000 in 2001 from approximately $0.5 million in 2000 due to lower average loan balances and lower interest rates during 2001.

Recent Accounting Pronouncements

Statement of Financial Accounting Standard No. 143, "Accounting for Asset Retirement Obligations" (SFAS 143), which was released in August 2001, addresses financial accounting and reporting for obligations associated with the retirement of tangible long-lived assets and their associated asset retirement costs. SFAS 143 requires an enterprise to record the fair value of an asset retirement obligation as a liability in the period in which it incurs a legal obligation associated with the retirement of intangible long-lived assets that result from the acquisition, construction, development, or normal use of the asset. The enterprise is also required to record a corresponding increase to the carrying amount of the related long-lived asset (i.e. the associated asset retirement cost) and to depreciate that cost over the life of the asset. The liability is changed at the end of each period to reflect the passage of time (i.e. accretion expense) and changes in the estimated future cash flows underlying the initial fair value measurement. Because of the extensive use of estimates, most enterprises will record a gain or loss when they settle the obligation. We are required to adopt SFAS 143 for our fiscal year beginning January 1, 2003; we do not expect the adoption of SFAS 143 to have a material impact on our financial position or results of operations.

In April 2002, the Financial Accounting Standards Board ("FASB") issued SFAS No. 145, "Rescission of FASB Statements No. 4, 44 and 64, Amendment of FASB Statement No. 13, and Technical Corrections." SFAS 145 amends existing guidance on reporting gains and losses on the extinguishment of debt to prohibit the classification of the gain or loss as extraordinary, as the use of such extinguishments have become part of the risk management strategy of many companies. SFAS 145 also amends SFAS 13 to require sale-leaseback accounting for certain lease modifications that have economic effects similar to sale-leaseback transactions. The provisions of the Statement related to the rescission of Statement No. 4 are applied in fiscal years beginning after May 15, 2002. Earlier application of these provisions is encouraged. The provisions of the Statement related to Statement No. 13 were effective for transactions occurring after May 15, 2002, with early application encouraged. The adoption of SFAS 145 is not expected to have a material effect on our financial statements.

In June 2002, the Financial Accounting Standards Board issued Statement of Financial Accounting Standard No. 146, "Accounting for Exit or Disposal Activities" (SFAS 146). SFAS 146 addresses significant issues regarding the recognition, measurement and reporting of costs associated with exit and disposal activities, including restructuring activities. SFAS 146 also addresses recognition of certain costs related to terminating a contract that is not a capital lease, costs to consolidate facilities or relocate employees and termination of benefits provided to employees that are involuntarily terminated under the terms of a one-time benefit arrangement that is not an ongoing benefit arrangement or an individual deferred compensation contract. SFAS 146 is effective for exit or disposal activities that are initiated

after December 31, 2002. Adoption of SFAS 146 is not expected to have a material impact on our financial position or results of operations.

In November 2002, the FASB issued Interpretation No. 45, "Guarantor's Accounting and Disclosure Requirements for Guarantees, Including Indirect Guarantees of Indebtedness to Others, an interpretation of FASB Statements No. 5, 57 and 107 and a rescission of FASB Interpretation No. 34." This Interpretation elaborates on the disclosures to be made by a guarantor in its interim and annual financial statements about its obligations under guarantees issued. The Interpretation also clarifies that a guarantor is required to recognize, at inception of a guarantee, a liability for the fair value of the obligation undertaken. The initial recognition and measurement provisions of the Interpretation are applicable to guarantees issued or modified after December 31, 2002, and are not expected to have a material effect on our financial statements. The disclosure requirements are effective for financial statements of interim and annual periods ending after December 31, 2002.

In December 2002, the FASB issued SFAS 148, "Accounting for Stock-Based Compensation - Transition and Disclosure, an amendment of FASB Statement No. 123." This Statement amends FASB Statement No. 123, "Accounting for Stock-Based Compensation," to provide alternative methods of transition for a voluntary change to the fair value method of accounting for stock-based employee compensation. In addition, this Statement amends the disclosure requirements of Statement No. 123 to require prominent disclosures in both annual and interim financial statements. Certain of the disclosure modifications are required for fiscal years ending after December 15, 2002, and are included in the notes to the financial statements included in this Form 10-K.

In January 2003, the FASB issued Interpretation No. 46, "Consolidation of Variable Interest Entities, an interpretation of ARB No. 51." This Interpretation addresses the consolidation by business enterprises of variable interest entities as defined in the Interpretation. The Interpretation applies immediately to variable interests in variable interest entities created after January 31, 2003, and to variable interests in variable interest entities obtained after January 31, 2003. Because we have no involvement with any variable interest entities, the application of this Interpretation is not expected to have a material effect on our financial statements.

FACTORS AFFECTING THE COMPANY'S PROSPECTS

Risks Related to Development Stage Company

If we fail to obtain necessary funds for our operations, we will be unable to maintain and improve our technology position and we will be unable to develop and commercialize our therapeutic proteins.

To date, we have funded our operations primarily through proceeds from the public and private placements of debt and equity securities, revenues from corporate collaborations, capital equipment and leasehold financing proceeds, gains from the sale of investments, and interest earned on investments. We believe that our existing cash and short-term investments, expected revenue from collaborations and license arrangements, anticipated financing of capital expenditures, and interest income should be sufficient to meet our operating and capital requirements at least through the middle of 2004. Our present and future capital requirements depend on many factors, including:

- the level of research and development investment required to develop our therapeutic proteins and improve our technology position;
- the progress of preclinical and clinical testing;

- the time and cost involved in obtaining regulatory approvals;
- our ability to enter into new agreements with collaborators and to extend our existing collaborations, and the terms of these agreements;
- our success rate or that of our collaborators in discovery efforts associated with milestones and royalties;
- the timing, willingness, and ability of our collaborators to commercialize products incorporating our technologies;
- costs of recruiting and retaining qualified personnel;
- costs of filing, prosecuting, defending, and enforcing patent claims and other intellectual property rights;
- our need or decision to acquire or license complementary technologies or new drug targets; and
- changes in product candidate development plans needed to address any difficulties in clinical studies or in commercialization.

We will require significant amounts of additional capital in the future, and we do not have any assurance that funding will be available when we need it on terms that we find favorable, if at all. We may seek to raise these funds through public or private equity offerings, debt financings, credit facilities, or through corporate collaborations and licensing arrangements.

If we raise additional capital by issuing equity securities, our existing stockholders' percentage ownership would be reduced and they may experience substantial dilution. We may also issue equity securities that provide for rights, preferences, or privileges senior to those of our common stock. If we raise additional funds by issuing debt securities, these debt securities would have rights, preferences, and privileges senior to those of our common stock, and the terms of the debt securities issued could impose significant restrictions on our operations. If we enter into a credit facility, the agreement may require us to maintain compliance with financial covenants and restrict our ability to incur additional debt, pay dividends, make redemptions or repurchases of capital stock, make loans, investments or capital expenditures, or engage in other activities. If we raise additional funds through collaborations and licensing arrangements, we may be required to relinquish some rights to our technologies or drug candidates, or to grant licenses on terms that are not favorable to us. If adequate funds are not available or are not available on acceptable terms, our ability to fund our operations, take advantage of opportunities, develop products or technologies, or otherwise respond to competitive pressures could be significantly delayed or limited, and we may need to downsize or halt our operations.

We have a history of losses, and we may incur continued losses for some time.

We have incurred losses each year, including net losses of $8.5 million for the year ended December 31, 2000, $13.3 million for the year ended December 31, 2001, and $26.4

million for the year ended December 31, 2002. Given our planned level of operating expenses, we expect to continue incurring losses for some time. As of December 31, 2002, we had an accumulated deficit of $108 million. To date, we have derived substantially all of our revenue from corporate collaborations, license agreements, and investments. We expect that substantially all of our revenue for the foreseeable future will result from these sources and from the licensing of our technologies. We also expect to spend significant amounts to expand our research and development on our proprietary drug candidates and

technologies, maintain and expand our intellectual property position, expand our manufacturing scale-up activities, and expand our business development and commercialization efforts. We may continue to incur substantial losses even if our revenues increase.

We have a joint venture with McNeil Nutritionals, a subsidiary of Johnson & Johnson. The joint venture has incurred losses since its inception, and we expect that the joint venture will incur additional losses for some time while it explores opportunities to continue the development of this technology.

We have not yet commercialized any products or technologies, and we may never become profitable.

We have not yet developed any products or commercialized any products or technologies, and we may never be able to do so. Since we began operations in 1990, we have not generated any revenues, except for interest income and revenues from collaborative agreements and investments. We do not know when or if we will complete any of our product development efforts, receive regulatory approval of any of our product candidates, or successfully commercialize any approved products. Even if we should be successful in developing products that are approved for marketing, we will not be successful unless our products, and products incorporating our technologies, gain market acceptance. The degree of market acceptance of these products will depend on a number of factors, including:

- the receipt of regulatory approvals for the uses we seek;
- the establishment and demonstration in the medical community of the safety and clinical efficacy of our products and their potential advantages over existing therapeutic products; and
- pricing and reimbursement policies of government and third-party payors, such as insurance companies, health maintenance organizations and other plan administrators.

Physicians, patients, payors or the medical community in general may be unwilling to accept, utilize or recommend any of our products or products incorporating our technologies. As a result, we are unable to predict the extent of future losses or the time required to achieve profitability, if at all. Even if we or our collaborators successfully develop one or more products that incorporate our technologies, we may not become profitable.

Risks Related to Development of Products and Technologies

We have limited product development and commercial manufacturing capability and experience, and we may be unable to develop therapeutic proteins and commercialize our technologies.

Until recently, we have not focused on the development of our own proprietary products. We are now seeking to use our GlycoAdvance, GlycoPEGylation and GlycoConjugation technologies to develop proprietary next generation proteins, generally in collaboration with a partner. Our technologies may not result in the successful remodeling, optimization or development of proteins that are safe or efficacious. Because the development of new pharmaceutical products is highly uncertain, our technologies may not produce any commercially successful proteins. If we fail to validate our technologies through the successful remodeling of the proteins we select for development, we will not be able to license our next generation drug candidates, and our customers will not be able to develop drug candidates incorporatiing our technologies.

To date, we have manufactured only smaller, noncommercial quantities of our enzymes, sugar nucleotides, and complex carbohydrates. We intend to manufacture enzymes and sugar nucleotides for use in our proprietary product

development programs and for use by our customers. Our success depends on our ability to manufacture these compounds on a commercial scale and in accordance with current Good Manufacturing Practices, or cGMP, prescribed by the U.S. Food and Drug Administration, or FDA. We may not be able to manufacture sufficient

quantities of the products we develop, even to meet our needs for pre-clinical or clinical development, and we may have problems complying, or maintaining compliance, with cGMP.

In addition to the normal scale-up risks associated with any manufacturing process, we may face unanticipated problems unique to the manufacture of enzymes, sugar nucleotides, or complex carbohydrates. If we are unable to develop commercial-scale manufacturing capacity, we would seek collaborators, licensees, or contract manufacturers to manufacture the compounds necessary to commercialize our technologies. We may not be able to find parties willing to manufacture these compounds at acceptable prices.

Any manufacturing facility must adhere to the FDA's evolving regulations on cGMP, which are enforced by the FDA through its facilities inspection program. The manufacture of products at any facility will be subject to strict quality control, testing, and record keeping requirements, and continuing obligations regarding the submission of safety reports and other post-market information. Ultimately, we or our contract manufacturers may not meet these requirements.

If we encounter delays or difficulties in connection with manufacturing, commercialization of our products and technologies could be delayed, or we could breach our obligations under our collaborative agreements.

Our success depends on collaborative relationships, and our failure to enter into new collaborations, or to successfully manage our existing and future collaborations and license arrangements, could prevent us from commercializing our product candidates and technologies.

We rely to a large extent on collaborative partners to co-develop our products and to commercialize products made using our technologies. This strategy entails many risks, including:

- we may be unsuccessful in entering into collaborative agreements for the co-development of our products or the commercialization of products incorporating our technologies;
- we may not be successful in adapting our technologies to the needs of our collaborative partners;
- our collaborators may not be successful in, or may not remain committed to, co-developing our products or commercializing products incorporating our technologies;
- our collaborators may not commit sufficient resources to incorporating our technologies into their products;
- our collaborators may seek to develop proprietary alternatives to our products or technologies;
- none of our collaborators is contractually obligated to market or commercialize our products or products incorporating our technologies, nor is any of them contractually required to achieve any specific production schedule;
- our collaborative agreements are generally terminable by our partners on short notice; and
- continued consolidation in our target markets may also limit our ability to enter into collaboration agreements, or may result in

terminations of existing collaborations.

Any of our present or future collaborators may breach or terminate their agreements with us or otherwise fail to conduct their collaborative activities successfully and in a timely manner. In addition, we may dispute the application of payment provisions under any of our collaborative agreements. If any of these events occur or if we fail to enter into or maintain collaborative agreements, we may not be able to commercialize our products and technologies.

We will be increasingly exposed to business interruption risks.

We are always exposed to the risks of business interruptions at our facilities and those of our collaborators and suppliers. Any interruption of our utility supplies or ability to continue work could delay our business and research activities and may render ongoing work worthless. As our manufacturing operations increase in importance, and as we scale up the size of our manufacturing batches, we will be increasingly exposed to these risks, any of which could result in significant expense and may result in our inability to comply with our development plans and contractual deadlines.

We may be exposed to product liability and related risks.

The use in humans of compounds developed by us or incorporating our technologies may result in product liability claims. Product liability claims can be expensive to defend, and may result in large settlements of claims or judgments against us. Even if a product liability claim is not successful, the adverse publicity, time, and expense involved in defending such a claim may interfere with our business. We may not be able to obtain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses.

Risks Related to Intellectual Property

The failure to obtain or maintain adequate patents, and other intellectual property protection, could impact our ability to compete effectively.

Our commercial success depends in part on avoiding infringing patents and proprietary rights of third parties and developing and maintaining a proprietary position with regard to our own technologies, products and business. As we seek to develop next generation proprietary products, we will have to investigate the patent protection for our target proteins. There have been significant litigation and interference proceedings regarding patent rights, and the patent situation regarding particular products is often complex and uncertain. For example, with respect to EPO, the target of our first development program, the status of issued patents is currently being litigated and may delay our ability to market EPO in the U.S As we choose other targets, we may face uncertainty and litigation could result, which could lead to liability for damages, prevent our development and commercialization efforts, and divert resources from our business strategy.

Legal standards relating to the validity and scope of claims in our technology field are still evolving. Therefore, the degree of future protection for our proprietary rights in our core technologies and products made using these technologies is also uncertain. The risks and uncertainties that we face with respect to our patents and other proprietary rights include the following:

- the pending patent applications we have filed or to which we have exclusive rights may not result in issued patents or may take longer than we expect to result in issued patents;

- we may be subject to interference proceedings;
- the claims of any patents that are issued may not provide meaningful protection;
- we may not be able to develop additional proprietary technologies that are patentable;
- the patents licensed or issued to us or our customers may not provide a competitive advantage;
- other companies may challenge patents licensed or issued to us or our customers;
- other companies may independently develop similar or alternative technologies, or duplicate our technologies; and
- other companies may design around technologies we have licensed or developed.

We cannot be certain that patents will be issued as a result of any of our pending applications. Nor can we be certain that any of our issued patents would give us adequate protection from competing products. For example, issued patents may be circumvented or challenged and declared invalid, narrow in scope, or unenforceable. In addition, since publication of discoveries in the scientific or patent literature often lags behind actual discoveries, we cannot be certain that we were the first to make our inventions or to file patent applications covering those inventions. In the event that another party has also filed a patent application relating to an invention claimed by us, we may be required to participate in an interference proceeding declared by the U.S. Patent and Trademark Office to determine priority of invention, which could result in substantial uncertainties and cost for us, even if the eventual outcome were favorable to us. It is also possible that others may obtain issued patents that could prevent us from commercializing our products or require us to obtain licenses requiring the payment of significant fees or royalties in order to enable us to conduct

our business. As to those patents that we have licensed, our rights depend on maintaining our obligations to the licensor under the applicable license agreement, and we may be unable to do so.

The cost to us of any patent litigation or other proceeding relating to our patents or applications, even if resolved in our favor, could be substantial. Others seeking to develop next generation versions of proteins, or the holders of patents on our target proteins, may have greater financial resources, making them better able to bear the cost of litigation. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to develop, manufacture, and market products, form strategic alliances, and compete in the marketplace.

In addition to patents and patent applications, we depend upon trade secrets and proprietary know-how to protect our proprietary technology. We require our employees, consultants, advisors, and collaborators to enter into confidentiality agreements that prohibit the disclosure of confidential information to any other parties. We require our employees and consultants to disclose and assign to us their ideas, developments, discoveries, and inventions. These agreements may not, however, provide adequate protection for our trade secrets, know-how, or other proprietary information in the event of any unauthorized use or disclosure.

International patent protection is uncertain.

Patent law outside the U.S. is uncertain, and is currently undergoing

review and revision in many countries. In addition, the laws of some foreign countries may not protect our intellectual property rights to the same extent as U.S. laws. We may participate in opposition proceedings to determine the validity of foreign patents belonging to us or our competitors, which proceedings could result in substantial costs and diversion of our efforts. Finally, some of our patent protection in the U.S. is not available to us in foreign countries due to the differences in the patent laws of those countries.

We may have to develop or license alternative technologies if we are unable to maintain or obtain key technology from third parties.

We have licensed patents and patent applications from a number of institutions. Some of our proprietary rights have been licensed to us under agreements that have performance requirements or other contingencies. The failure to comply with these provisions could lead to termination or modifications of our rights to these licenses. Additionally, we may need to obtain additional licenses to patents or other proprietary rights from other parties to facilitate development of our proprietary technology base. If our existing licenses are terminated or if we are unable to obtain such additional licenses on acceptable terms, our ability to perform our own research and development and to comply with our obligations under our collaborative agreements may be delayed while we seek to develop or license alternative technologies.

Risks Related to Competition

We are exposed to intense competition from many sources.

Our potential competitors include both public and private pharmaceutical and biotechnology companies. A number of these competitors are working on the development of next generation protein therapeutics. Compared to us, many of these companies have more:

- financial, scientific, and technical resources;
- product development, manufacturing and marketing capabilities;
- experience conducting preclinical studies and clinical trials of new products; and
- experience in obtaining regulatory approvals for products.

Competitors may succeed in developing products and technologies that are more effective and less costly than ours, which would render our products or technologies, or both, obsolete or noncompetitive. For example, potential customers may develop other ways to achieve the benefits of our technology. Competitors also may prove to be more

successful in designing, manufacturing and marketing of products. If we are successful in developing our own drug candidates or versions of drugs that are no longer patented, we will compete with other drug manufacturers for market share. If we are unable to compete successfully, our commercial opportunities will be diminished.

We operate in an environment of rapid technological change, and we may fall behind our competitors.

Our business is characterized by extensive research efforts and rapid technological progress. New developments in molecular biology, medicinal chemistry, and other fields of biology and chemistry are expected to continue at a rapid pace in both industry and academia. Research and discoveries by others

may render some or all of our target products or technologies, or both, noncompetitive or obsolete. We know that other companies with substantial resources are working on the development of next generation proteins, and they may achieve better results in remodeling our target proteins or the target proteins of our potential collaborators.

We may be unable to retain key employees or recruit additional qualified personnel.

Because of the specialized scientific nature of our business, we are highly dependent upon qualified scientific, technical, and managerial personnel. There is intense competition for qualified personnel in our business. Therefore, we may not be able to attract and retain the qualified personnel necessary for the development of our business. The loss of the services of existing personnel, as well as the failure to recruit additional key scientific, technical, and managerial personnel in a timely manner, would harm our research and development programs or our manufacturing capabilities.

Risks Related to Government Approvals

We are subject to extensive government regulation, and we or our collaborators may not obtain necessary regulatory approvals.

The research, development, manufacture, marketing, and sale of our reagents and product candidates manufactured using our technologies are subject to significant, but varying, degrees of regulation by a number of government authorities in the U.S. and other countries.

Pharmaceutical product candidates manufactured using our technologies must undergo an extensive regulatory approval process before commercialization. This process is regulated by the FDA and by comparable agencies in the EU and other countries. The U.S. and foreign regulatory agencies have substantial discretion to terminate clinical trials, require additional testing, delay or withhold registration and marketing approval, and mandate product withdrawals. Even if regulatory approvals were obtained, our manufacturing processes would be subject to continued review by the FDA and other regulatory authorities. Any later discovery of unknown problems with our products, products incorporating our technologies, or manufacturing processes could result in restrictions on such products or manufacturing processes, including potential withdrawal of the products from the market. In addition, if regulatory authorities determine that we have not complied with regulations in the research and development of a product candidate or the manufacture of our reagents, then we may not obtain necessary approvals to market and sell the product candidate or reagents.

Neither we nor our collaborators have submitted any product candidates for marketing approval to the FDA or any other regulatory authority. If any product candidate manufactured using our technology is submitted for regulatory approval, it may not receive the approvals necessary for commercialization, the desired labeling claims, or adequate levels of reimbursement. Any delay in receiving, or failure to receive, these approvals would adversely affect our ability to generate product revenues or royalties. In addition, new governmental regulations may delay or alter regulatory approval of any product candidate manufactured using our technology. We cannot predict the impact of adverse governmental action that might arise from future legislative and administrative action.

The use of hazardous materials in our operations may subject us to environmental claims or liability.

Our research and development processes involve the controlled use of hazardous materials, chemicals, and radioactive compounds. The risk of accidental injury or contamination from these materials cannot be entirely eliminated. We do not maintain a separate insurance policy for these types of risks. In the event of an accident or environmental discharge, we may be held liable for any resulting damages, and any liability could exceed our resources. We are subject to federal, state, and local laws and regulations governing the use, storage, handling, and disposal of these materials and specified waste products. The cost of compliance with these laws and regulations could be significant.

Third party reimbursement for our collaborators' or our future product candidates may not be adequate.

Even if regulatory approval is obtained to sell any product candidates incorporating our technologies, our future revenues, profitability, and access to capital will be determined in part by the price at which we or our collaborators can sell such products. There are continuing efforts by governmental and private third-party payors to contain or reduce the costs of health care through various means. We expect a number of federal, state, and foreign proposals to control the cost of drugs through governmental regulation. We are unsure of the form that any health care reform legislation may take or what actions federal, state, foreign, and private payors may take in response to the proposed reforms. Therefore, we cannot predict the effect of any implemented reform on our business.

Our ability to commercialize our products successfully will depend, in part, on the extent to which reimbursement for the cost of such products and related treatments will be available from government health administration authorities, such as Medicare and Medicaid in the U.S., private health insurers, and other organizations. Significant uncertainty exists as to the reimbursement status of newly approved healthcare products, particularly for indications for which there is no current effective treatment or for which medical care typically is not sought. Adequate third-party coverage may not be available to enable us to maintain price levels sufficient to realize an appropriate return on investment in product research and development. Inadequate coverage and reimbursement levels provided by government and third-party payors for use of our or our collaborators' products may cause these products to fail to achieve market acceptance and would cause us to lose anticipated revenues and delay achievement of profitability.

Risks Related to Stock Market

Our stock price may continue to experience fluctuations.

The market prices of securities of thinly traded biotechnology companies, such as ours, have historically been highly volatile. Sales of a substantial number of shares of our common stock in the public market or the perception that such sales might occur could adversely affect the market price of our common stock. We have a number of investors who hold relatively large positions in our securities. A decision by any of these investors to sell all or a block of their holdings of our common stock could cause our stock price to drop significantly.

The market also continues to experience significant price and volume fluctuations, many of which are unrelated to the operating performance of particular companies. In recent years, the price of our common stock has fluctuated significantly and may continue to do so in the future. If we raise additional capital by issuing equity securities in a fluctuating market, many or all of our existing stockholders may experience substantial dilution. If any of the risks described in these "Factors Affecting the Company's Prospects"

occurred, or if any unforeseen risk affected our performance, it could have a dramatic and adverse impact on the market price of our common stock.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURE ABOUT MARKET RISK.

Our holdings of financial instruments are comprised primarily of government agency securities. All such instruments are classified as securities held to maturity. We seek reasonable assuredness of the safety of principal and market liquidity by investing in rated fixed income securities, while at the same time seeking to achieve a favorable rate of return. Our market risk exposure consists principally of exposure to changes in interest rates. Our holdings are also exposed to the risks of changes in the credit quality of issuers. We typically invest in the shorter-end of the maturity spectrum. As of December 31, 2002, the marketable securities that we held consisted of obligations of U.S government agencies. The approximate principal amount and weighted-average interest rate per year of our investment portfolio as of December 31, 2002 was approximately $38.2 million and 1.5%, respectively.

We have exposure to changing interest rates on our taxable and tax-exempt bonds, and we are currently not engaged in hedging activities. Interest on approximately $5.1 million of outstanding indebtedness is relating to the bonds at an interest rate that varies weekly, depending on the market rates for AA-rated taxable and tax-exempt obligations. As of December 31, 2002, the weighted-average, effective interest rate was approximately 3.3% per year.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA.

(a) Financial Statements.

The Financial Statements required by this item are attached to this Annual Report on Form 10-K beginning on page F-1.

(b) Supplementary Data.

Quarterly financial data (unaudited)
(in thousands, except per share data)

2002 Quarter Ended	Dec. 31	Sept. 30	June 30	Mar. 31
Revenue from collaborative agreements	$ 294	$ 2,187	$ 1,561	$ 771
Net loss	(6,377)	(5,955)	(6,490)	(7,595)
Basic and diluted net loss per share	(0.45)	(0.42)	(0.45)	(0.53)
2001 Quarter Ended	Dec. 31	Sept. 30	June 30	Mar. 31
Revenue from collaborative agreements	$ 332	$ 330	$ 292	$ 312
Net income (loss)	4	(4,824)	(5,210)	(3,299)
Basic and diluted net loss per share	--	(0.34)	(0.37)	(0.24)

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE.

As previously reported on a Current Report on Form 8-K dated April 29, 2002 (the "Form 8-K"), our Board of Directors, upon recommendation of the Audit Committee, informed the Company's independent public accountants, Arthur Andersen LLP ("Arthur Andersen"), that they would be dismissed as the Company's independent public

accountants and engaged KPMG LLP ("KPMG") to serve as the Company's independent public accountants for the fiscal year 2002. The appointment of KPMG was effective immediately.

Arthur Andersen's reports on the Company's consolidated financial statements for each of the years ended December 31, 2001 and 2000 did not contain an adverse opinion or disclaimer of opinion, nor were they qualified or modified as to uncertainty, audit scope or accounting principles.

During the years ended December 31, 2001 and 2000 and through April 30, 2002 (the filing date of the Form 8-K), there were no disagreements with Arthur Andersen on any matter of accounting principles or practices, financial statement disclosure, or auditing scope or procedure which, if not resolved to Arthur Andersen's satisfaction, would have caused them to make reference to the subject matter in connection with their report on the Company's consolidated financial statements for such years; and there were no reportable events as defined in Item 304(a)(1)(v) of Regulation S-K.

The Company provided Arthur Andersen with a copy of the foregoing disclosures, and we filed as an Exhibit to the Form 8-K a copy of Arthur Andersen's amended letter, dated May 14, 2002, stating its agreement with such statements.

During the years ended December 31, 2001 and 2000 and through April 30, 2002 (the filing date of the Form 8-K), the Company did not consult KPMG with respect to the application of accounting principles to a specified transaction, either completed or proposed, or the type of audit opinion that might be rendered on the Company's consolidated financial statements, or any other matters or reportable events as set forth in Items 304(a)(2)(i) and (ii) of Regulation S-K.

PART III

ITEM 10. DIRECTORS AND EXECUTIVE OFFICERS OF THE REGISTRANT.

You should read "Executive Officers of the Company" following Item 1 of this Annual Report for a description of persons who served as our executive officers on March 14, 2003. The following table shows the name, age and position of each of our executive officers and directors as of March 14, 2003:

Name	Age	Position
Executive Officers		

C. Boyd Clarke	54	President and Chief Executive Officer
David A. Zopf, M.D.	60	Executive Vice President
Robert I. Kriebel	60	Senior Vice President and Chief Financial Officer
Debra J. Poul, Esq.	50	Senior Vice President and General Counsel
George J. Vergis, Ph.D.	42	Senior Vice President, Business and Commercial Developm
Joseph J. Villafranca, Ph.D.	58	Senior Vice President, Pharmaceutical Development and C
A. Brian Davis	36	Vice President, Finance
Marjorie A. Hurley, Pharm.D.	43	Vice President, Regulatory Affairs and Project Manageme

Directors

C. Boyd Clarke	54	Director
L. Patrick Gage, Ph.D.	60	Director
William F. Hamilton, Ph.D.	63	Director
Douglas J. MacMaster, Jr.	72	Director
P. Sherrill Neff	51	Director
Mark H. Rachesky, M.D.	44	Director
Stephen A. Roth, Ph.D.	60	Chairman
Lowell E. Sears	51	Director
Elizabeth H.S.Wyatt	55	Director

Biographic Information Regarding Our Directors as of March 14, 2003

C. Boyd Clarke, 54, has served on our Board, and as President and Chief Executive Officer, since March 2002. From December 1999 through March 2002, Mr. Clarke was President and Chief Executive Officer of Aviron, a biotechnology company developing vaccines, which was acquired by MedImmune, and was also Chairman from January 2001 through March 2002. From 1998 through 1999, Mr. Clarke was Chief Executive Officer and President of U.S. Bioscience, Inc., a biotechnology company focused on products to treat cancer, which also was acquired by MedImmune. Mr. Clarke served as President and Chief Operating Officer of U.S. Bioscience, Inc. from 1996 to 1998. From 1977 to 1996, Mr. Clarke held a number of positions at Merck & Co., Inc., including being the first President of Pasteur-Merieux MSD, and most recently as Vice President of Merck Vaccines. Mr. Clarke has a B.S. in biochemistry, and an M.A. in history from the University of Calgary. Mr. Clarke also serves on the Board of Trustees to the Textile Museum in Washington, D.C.

L. Patrick Gage, Ph.D., 60, has served on our Board since October 2002. Dr. Gage is Chairman of Compound Therapeutics, a private biotechnology company, and Chairman of the Dublin (IE) Molecular Medicine Centre. He is also an advisor to the Life Sciences Research Foundation, Perkin Elmer, Inc. and Warburg Pincus LLC. Dr. Gage served as Senior Vice President, Science and Technology, at Wyeth, from 2001 to 2002, and as President of Wyeth Research from 1998 to 2002. Prior to Wyeth, Dr. Gage held positions of increasing responsibility at Genetics Institute, Inc. from 1989 to 1998, culminating with his service as President after the company was acquired by Wyeth.

He also spent 18 years at Hoffmann-La Roche, Inc. in various scientific and management positions. Dr. Gage serves as a director of the Biotechnology Institute and the Philadelphia Orchestra Association. Dr. Gage has a B.S. in physics from Massachusetts Institute of Technology and a Ph.D. from The University of Chicago.

William F. Hamilton, Ph.D., 63, has served on our Board since 1991. Dr. Hamilton has served on the University of Pennsylvania faculty since 1967, and is

the Landau Professor of Management and Technology, and Director of the Jerome Fisher Program in Management and Technology at The Wharton School and the School of Engineering and Applied Science. He serves as a director of Digital Lightwave, Inc., a manufacturer of telecommunications test equipment. Dr. Hamilton received his B.S. and M.S. in chemical engineering and his M.B.A. from the University of Pennsylvania, and his Ph.D. in applied economics from the London School of Economics.

Douglas J. MacMaster, Jr., 72, has served on our Board since 1993. Mr. MacMaster served as Senior Vice President of Merck & Co., Inc. from 1988 to 1992, where he was responsible for worldwide chemical and pharmaceutical manufacturing, the Agvet Division, and the Specialty Chemicals Group. From 1985 to 1988, Mr. MacMaster was President of the Merck Sharp Dohme Division of Merck. Mr. MacMaster serves as a director of the following publicly-held companies: Stratton Mutual Funds, and Martek Biosciences Corp., a biological products manufacturing company. He received his B.A. from St. Francis Xavier University, and his J.D. from Boston College Law School.

P. Sherrill Neff, 51, has served on our Board since 1994. He served as President and Chief Financial Officer from December 1994 through January 2002, and as Chief Operating Officer from April 2000 through January 2002. Mr. Neff is now Managing Partner of Quaker BioVentures, L.P., a venture capital firm. From 1993 to 1994, Mr. Neff was Senior Vice President, Corporate Development, at U.S. Healthcare, Inc., a managed healthcare company. From 1984 to 1993, he worked at Alex. Brown & Sons Incorporated, an investment banking firm, where he held a variety of positions, most recently as Managing Director and Co-Head of the Financial Services Group. Mr. Neff is a director of Resource America, Inc., a publicly-held energy and real estate finance company. Mr. Neff is also on the Board of Directors of University City Science Center, the Greater Philadelphia Venture Group, and the Biotechnology Institute. Mr. Neff received his B.A.in religion from Wesleyan University, and his J.D. from the University of Michigan Law School.

Mark H. Rachesky, M.D., 44, has served on our Board since 1999. Dr. Rachesky is the founder and President of MHR Fund Management LLC and affiliates, investment managers of various private investment funds that invest in inefficient market sectors, including special situation equities and distressed investments. From 1990 through June 1996, Dr. Rachesky was employed by Carl C. Icahn, initially as a senior investment officer and for the last three years as sole Managing Director of Icahn Holding Corporation, and acting chief investment advisor. Dr. Rachesky is currently on the Board of Directors of Samsonite Corporation and Keryx Biopharmaceuticals, Inc. Dr. Rachesky is a graduate of Stanford University School of Medicine, and Stanford University School of Business. Dr. Rachesky graduated from the University of Pennsylvania with a major in Molecular Aspects of Cancer.

Stephen A. Roth, Ph.D., 60, has served on our Board since 1989, and as Chairman from 1994. Dr. Roth is President and Chief Executive Officer of Immune Control, Inc. He co-founded Neose, served as Chief Executive Officer from August 1994 until March 2002, and now serves as a consultant. From 1992 until August 1994, he served as Senior Vice President, Research and Development and Chief Scientific Officer. Dr. Roth was on the faculty of the University of Pennsylvania from 1980 to 1994, and was Chairman of Biology from 1982 to 1987. Dr. Roth received his A.B. in biology from The Johns Hopkins University, and his Ph.D. in developmental biology from the Case Western Reserve University. He completed his post-doctorate training in carbohydrate chemistry at The Johns Hopkins University.

Lowell E. Sears, 52, has served on our Board since 1994. He has been a private investor involved in portfolio management and life sciences venture capital since April 1994. From 1988 until April 1994, Mr. Sears was Chief Financial Officer of Amgen Inc., a pharmaceutical company, and from 1992 until

1994, he also served as Senior Vice President responsible for the Asia-Pacific region. Mr. Sears is a director of Techne Corp. which is a publicly-held biotechnology company. Mr. Sears received his B.A. in economics from Claremont McKenna College, and his M.B.A. from Stanford University.

Elizabeth H.S. Wyatt, 55, has served on our Board since May 2002. From 1980 through December 2000, Ms. Wyatt held a variety of positions at Merck & Co., Inc., most recently as Merck's Vice President, Corporate Licensing, heading Merck's worldwide product and technology acquisition activities. Prior to joining Merck in 1980, Ms. Wyatt was a consultant and an academic administrator, responsible for the Harvard Business School's first formal marketing of its executive education programs. She currently serves on the Boards of Directors of MedImmune, Inc. and ARIAD Pharmaceuticals, and on the Board of Trustees of Randolph-Macon College. Ms. Wyatt received her B.A., magna cum laude, from Sweet Briar College, an M. Ed. in counseling psychology from Boston University, and an M.B.A. with honors from Harvard University.

Section 16(a) Beneficial Ownership Reporting Compliance

Based solely upon a review of reports of stock ownership (and changes in stock ownership) and written representations received by us, we believe that our directors and executive officers met all of their filing requirements under Section 16(a) of the Securities and Exchange Act of 1934 during the year ended December 31, 2002.

ITEM 11. EXECUTIVE COMPENSATION

Summary Compensation Table

The following table provides information about all compensation earned in 2002, 2001, and 2000 by the individuals who served as Chief Executive Officer during 2002, and the four other most highly compensated executive officers during 2002.

				Long-term Compensation
		Annual Compensation		Shares
Name and Principal Position	Year	Salary	Bonus	Underlying Options (#)
C. Boyd Clarke (1)	2002	$ 339,231	$ 254,423	750,000
President and Chief Executive Officer				
Stephen A. Roth (3)	2002	79,245	--	--
Chairman and Former Chief	2001	294,866	147,433	50,000
Executive Officer	2000	274,294	109,718	50,000
David A. Zopf	2002	240,413	96,065	30,000
Executive Vice President	2001	200,136	45,021	25,000
	2000	180,303	54,091	25,000
Debra J. Poul (6)	2002	213,333	67,500	85,000
Senior Vice President and	2001	144,933	20,925	7,500

General Counsel	2000	102,462	16,200	10,000
George J. Vergis (7)	2002	220,500	66,150	35,000
Senior Vice President, Business and Commercial Development	2001	93,154	47,250	180,000
Marjorie A. Hurley	2002	153,086	39,468	15,000
Vice President, Regulatory Affairs and Project Management	2001	137,998	21,114	12,000
	2000	125,453	16,936	10,000

(1) Mr. Clarke joined Neose in March 2002.
(2) Includes $397,094 during 2002 of reimbursement of relocation expenses to Mr. Clarke, and $252 in premiums paid by us for group term life insurance.

(3) Dr. Roth was employed by Neose, and served as chief executive officer, until March 2002.
(4) Includes $356,603 paid to Dr. Roth for consulting fees pursuant to his Separation and Consulting Agreement; $10,000 paid to Dr. Roth's attorney for services rendered to Dr. Roth for negotiating that agreement; and $1,540, $5,250, and $5,040 of matching contributions in 2002, 2001, and 2000, respectively, to Dr. Roth's account in our 401(k) plan. Also includes $84, $432, and $432 in 2002, 2001, and 2000, respectively in premiums paid by us for group term life insurance.
(5) Includes $5,500, $5,214, and $4,530 of matching contributions in 2002, 2001, and 2000, respectively, to Dr. Zopf's account in our 401(k) Plan. Also includes $336, $432, and $432 in 2002, 2001, and 2000, respectively in premiums paid by us for group term life insurance.
(6) Ms. Poul joined Neose in January 2000 and served on a part-time basis until May 2002. Includes $5,500, $4,028, and $1,500 of matching contributions in 2002, 2001, and 2000, respectively, to Ms. Poul's account in our 401(k) Plan. Also includes $336, $432, and $288 in 2002, 2001, and 2000, respectively in premiums paid by us for group term life insurance.
(7) Dr. Vergis joined Neose in July 2001.
(8) Includes $5,500 of matching contributions in 2002 to Dr. Vergis' account in our 401(k) plan. Also includes $336 and $180 in 2002 and 2001, respectively, in premiums paid by us for group term life insurance.
(9) Includes $5,500, $3,660, and $3,346 of matching contributions in 2002, 2001, and 2000, respectively, to Dr. Hurley's account in our 401(k) Plan. Also includes $336, $432, and $432 in 2002, 2001, and 2000, respectively in premiums paid by us for group term life insurance.

Employment Agreements

In March 2002, we entered into an employment agreement with C. Boyd Clarke when he joined the Company as our President and Chief Executive Officer. Under this agreement, which includes non-competition and confidentiality covenants:

- The Company agreed that Mr. Clarke would receive a minimum base salary of $450,000 per year, and an annual performance incentive bonus, with a target amount of 75% of base salary, based upon the achievement of annual goals established by the Board of Directors and Mr. Clarke, which were established soon after his arrival at the Company with respect to 2002;

- The Board of Directors granted Mr. Clarke options to purchase 500,000 shares of common stock at an exercise price of $32.05 per share, the

fair market value on the date of grant, as follows:

an incentive stock option to purchase 12,480 shares, which option vests totally in four years from the date of grant, with 3,120 shares vesting on March 29, 2003, 260 shares vesting on the last day of each of the 24 months in 2004 and 2005, and an additional 1,040 shares vesting on the last day of each of the first three months of 2006; and

a non-qualified stock option to purchase 487,520 shares, which option vests totally in four years from the date of grant, with 121,880 shares vesting on March 29, 2003, and shares vesting on a monthly basis thereafter such that an aggregate of 93,750, 121,880, 121,880 and 28,130 options vest in each of the remainder of 2003, 2004, 2005, and the first three months of 2006, respectively.

- The Company agreed to reimburse Mr. Clarke for job-related expenses and reasonable costs related to the relocation of his residence to Pennsylvania, including travel expenses, temporary housing costs, realtor fees not to exceed $180,000, moving costs, closing costs in connection with the purchase of a new home, and $25,000 to defray additional miscellaneous expenses. Each of these payments is subject to partial repayment by Mr. Clarke in the event he resigns from Neose other than for good reason, as defined in the agreement.

- In the event that Mr. Clarke is involuntarily terminated without cause or resigns for good reason (each as defined in the agreement), provided that Mr. Clarke and Neose enter into a mutual release of claims, Mr. Clarke would receive on the date of such termination a cash payment equal to one year of base salary,

target annual bonus for the year in which the termination occurs, and any unpaid bonus amounts from prior years. Additionally, all outstanding options that would have vested in the 12 months following termination would immediately vest and remain exercisable for 12 months following termination.

- In the event that Mr. Clarke is involuntarily terminated without cause or resigns for good reason (each as defined in the agreement) within 18 months following certain changes of control of Neose or a sale of all or substantially all of our assets in a complete liquidation or dissolution, provided that Mr. Clarke and Neose enter into a mutual release of claims, Mr. Clarke would receive on the date of such termination a cash payment equal to two years of base salary, two times the target annual bonus for the year in which termination occurs, and any unpaid bonus amounts from prior years. Additionally, all outstanding options would immediately vest and remain exercisable for 12 months following termination.

- In the even that payments to Mr. Clarke under the employment agreement would result in the imposition of a parachute excise tax under Internal Revenue Code Section 4999, Mr. Clarke would be entitled to receive an additional "gross-up" payment to insulate him from the effect of that tax.

Change of Control Agreements

During the third quarter of 2002, we entered into change of control agreements with Drs. Zopf, Vergis, and Hurley and Ms. Poul. In the event any of these executive officers is involuntarily terminated without cause (as defined in the agreement), the executive would receive on the date of termination a cash payment equal to six months base salary. The Company also would arrange for outplacement services for the employee and provide medical benefits to the employee (and his or her spouse and dependents, if they were covered immediately prior to such termination) for six months, at a monthly cost to the employee equal to the monthly cost of such coverage, if any, to the employee immediately prior to such termination.

In the event that any of these executive officers is involuntarily terminated without cause or resigns for good reason within 12 months following a change of control (each as defined in the agreement), the executive would receive on the date of termination a cash payment equal to one year of base salary and the employee's target annual bonus for the year in which the termination occurs. Additionally, all outstanding options that would have vested in the 12 months following termination would immediately vest and remain exercisable for 12 months following termination. The Company also would arrange for outplacement services for the employee and provide medical benefits to the employee (and his or her spouse and dependents, if they were covered immediately prior to such termination) for 12 months, at a monthly cost to the employee equal to the monthly cost of such coverage, if any, to the employee immediately prior to such termination. In the event payments to any executive under the change of control agreement would result in the imposition of a parachute excise tax under Section 280(G) of the Internal Revenue Code, the executive would be entitled to receive an additional "gross-up" payment to insulate the executive from the effect of that tax.

The change of control agreements require these executives to release the Company from certain claims and to comply with certain restrictive covenants.

Separation and Consulting Agreement

In March 2002, we entered into a Separation and Consulting Agreement with Stephen A. Roth, Ph.D., who was our Chief Executive Officer. Under this agreement, Dr. Roth agreed to provide consulting services to the Chief Executive Officer and the Board of Directors for a period of 12 months, and the Company agreed to provide health insurance benefits to Dr. Roth and pay him $39,622 per month for 12 months. On or before the first anniversary of this agreement, Dr. Roth may agree to extend his non-competition and non-solicitation commitments, and his consulting obligations, for two additional years by entering into a separate non-competition agreement. If he does so, we will continue his health insurance benefits for six additional months, extend the $39,622 monthly payments for 24 additional months and, for purposes of stock option vesting and exercisability, treat Dr. Roth as remaining in service to Neose until the third anniversary of his resignation as Chief Executive Officer (or until the end of his service as a director, if later). Dr. Roth also released us from any obligations we may have incurred in connection with his employment with us.

Compensation of Directors

Directors who are also Neose employees receive no additional compensation for serving as a director or as a member of any Committee of the Board. Under our standard arrangements, which are currently under review, each non-employee director receives annually a retainer of $14,000, which may be applied, in whole or in part, toward the acquisition of an option to purchase shares of our common stock. Upon initial election or appointment to the Board of Directors, each

non-employee director receives an option to purchase 30,000 shares of our common stock, and upon re-election to the Board, each non-employee director receives an option to purchase 10,000 shares of our common stock. Each automatic option grant has an exercise price equal to the fair market value on the date of grant. Each automatic grant is immediately exercisable, and has a term of ten years, subject to earlier termination, following the director's cessation of service on the Board of Directors. Any shares purchased upon exercise of the option are subject to repurchase should the director's service as a non-employee director cease prior to vesting of the shares. The initial automatic option grant of 30,000 shares vests in successive equal, annual installments over the director's initial four-year period of Board service. Each annual automatic option grant vests upon the director's completion of one year of service on the Board of Directors, as measured from the grant date. Each outstanding option vests immediately, however, upon certain changes in the ownership or control of the Company.

Non-employee directors are also compensated for their services at each meeting of the Board or Committees on which they serve, at the following rates: $2,500 for Board meetings attended in person; $2,000 ($2,500 for the Chairman) for Committee meetings attended in person; and $1,000 for telephonic meetings of the Board or a Committee lasting longer than 30 minutes.

All Board members are reimbursed for their reasonable travel expenses incurred to attend meetings of the Board or Committees of the Board on which they serve.

Option Grant Table

The following table provides information about grants of stock options made during 2002 to each of the executive officers named in our Summary Compensation Table.

	Individual Grants				Poten
Name	Number of Shares Underlying Options Granted	Percentage of Total Options Granted to Employees (1)	Exercise Price	Expiration Date	at As Stock P 5%
C. Boyd Clarke	500,000 (3)	33.9%	$32.05	03/29/12	$ 10,078,
	250,000 (4)	17.0	8.75	12/24/12	1,375,
Stephen A. Roth	--	--	--	--	
David A. Zopf	30,000 (4)	2.0	10.62	12/12/12	200,
Debra J. Poul	50,000 (4)	3.4	11.61	05/27/12	365,
	35,000 (4)	2.4	10.62	12/12/12	233,
George J. Vergis	35,000 (4)	2.4	10.62	12/12/12	233,
Marjorie A. Hurley	15,000 (4)	1.0	11.61	05/27/12	109,

(1) Based on a total of 1,473,800 options granted during 2002 to employees to purchase common stock.

(2) The potential realizable value of each grant is calculated assuming that the market price per share of common stock appreciates at annualized rates of 5% and 10% over the ten-year option term. The results of these calculations are based on rates set forth by the Securities and Exchange Commission and are not intended to forecast possible future appreciation of

the price of our common stock.

(3) Includes (i) an incentive stock option to purchase 12,480 shares, which option vests totally in four years from the date of grant, with 3,120 vesting on March 29, 2003, 260 shares vesting on the last day of each of the 24 months in 2004 and 2005, and an additional 1,040 shares vesting on the last day of each of the first three months of 2006; and (ii) a non-qualified stock option to purchase 487,520 shares, which option vests totally in four years from the date of grant, with 122,880 shares vesting on March 29, 2003, and shares vesting on a monthly basis thereafter such that an aggregate of 93,750, 121,880, 121,880 and 28,130 options vest in each of the remainder of 2003, 2004, 2005, and the first three months of 2006, respectively.

(4) Each option has a term of ten years from the date of grant and vests ratably over a four-year period, beginning on the first anniversary of the date of grant.

Aggregated Fiscal Year-End Option Values

The following table provides information about the exercise of stock options during 2002 and the value of stock options unexercised at the end of 2002 for the executive officers named in our Summary Compensation Table. The value of unexercised stock options is calculated by multiplying the number of option shares by the differences between the option exercise price and the year-end stock price.

Name	Number of Shares Acquired On Exercise	Value Realized	Number of Shares Underlying Unexercised Options		Valu In-
			Exercisable	Unexercisable	Exercis
C. Boyd Clarke	--	$ --	--	750,000	$
Stephen A. Roth	--	--	398,333	70,000	60
David A. Zopf	20,899	629,060	79,791	64,375	
Debra J. Poul	--	--	6,875	95,625	
George J. Vergis	--	--	42,917	172,083	
Marjorie A. Hurley	3,481	29,623	54,958	30,875	18

Compensation Committee Interlocks and Insider Participation

The Compensation Committee consists of Douglas J. MacMaster, Jr. (chairman), L. Patrick Gage,Ph.D., and Elizabeth H.S. Wyatt, each of whom is a non-employee director. There are no compensation committee interlocks between our Company and any other entity involving our Company's or such other entity's executive officers or board members.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT.

The following table shows information known to us about beneficial ownership (as defined under the regulations of the Securities and Exchange Commission) of our common stock by:

. Each person we know to be the beneficial owner of at least five

percent of our common stock;
- Each director (eight of whom are nominees for re-election and one of whom is not);
- Each executive officer named in our Summary Compensation Table; and
- All directors and executive officers as a group.

Unless otherwise indicated, the information is as of March 14, 2003.

On March 14, 2003, there were 17,207,766 shares of our common stock outstanding. To calculate a shareholder's percentage of beneficial ownership, we must include in the numerator and denominator those shares underlying options that a person has the right to acquire upon the exercise of stock options within 60 days after March 14, 2003. Options held by other shareholders are disregarded in this calculation. Therefore, the denominator used in calculating beneficial ownership among our shareholders may differ. Unless we have indicated otherwise, each person

named in the table below has sole voting power and investment power for the shares listed opposite such person's name.

Name of Beneficial Owner	Number of Shares of Common Stock Beneficially Owned	Percent of Shares Outstandin
Eastbourne Capital Management, LLC (1) 1101 Fifth Avenue Suite 160 San Rafael, CA 94901	2,933,166	17.0%
Kopp Investment Advisors, Inc. (2) 7701 France Avenue South Suite 500 Edina, MN 55455	2,284,384	13.3%
George W. Haywood (3) c/o Cronin & Vris, LLP 380 Madison Avenue, 24/th/ Floor New York, NY 10017	1,588,866	9.2%
Domain Partners V, L.P.(4) DP V Associates, L.P. One Palmer Square Princeton, NJ 08542	949,766	5.5%
Lindsay A. Rosenwald, M.D. (5) c/o Paramount Capital, Inc. 787 7/th/ Avenue New York, NY 10019	917,280	5.3%
Directors and Named Executive Officers		
Mark H. Rachesky, M.D. (6)(7) c/o MHR Fund Management LLC 40 West 57/th/ Street, 33/rd/ Floor		

New York, NY 10019	791,648	4.6%
Stephen A. Roth, Ph.D. (6)(8)	612,224	3.5%
P. Sherrill Neff (6)(9)	499,396	2.8%
C. Boyd Clarke (6)	170,617	1.0%
Douglas J. MacMaster, Jr. (6)	100,990	*
William F. Hamilton, Ph.D. (6)(10)	85,152	*
David A. Zopf, M.D. (6)	83,097	*
Lowell E. Sears (6)(11)	65,956	*
Marjorie A. Hurley, Pharm.D. (6)	60,885	*
George J. Vergis, Ph.D. (6)	44,360	*
Debra J. Poul (6)	14,980	*
Elizabeth Wyatt (6)	9,505	*
L. Patrick Gage, Ph.D. (6)	3,500	*
All current directors and executive officers as a group (16 persons) (6)	3,546,155	19.1%

* Less than one percent.

(1) According to a Schedule 13G/A filed February 13, 2003: (i) Eastbourne Capital Management, LLC ("Eastbourne"), is a registered investment advisor whose clients (including Black Bear Offshore Master Fund Limited ("BB Offshore") and Black Bear Fund I ("BB"), have the right to receive or the power to direct the receipt of dividends from, or the proceeds from the sale of, the reported shares; (ii) Eastbourne filed the Schedule 13G/A jointly with Richard Jon Barry ("Mr. Barry"), who is the controlling member of Eastbourne, BBear Offshore and Black Bear; (iii) Eastbourne and Mr. Barry comprise a group, but they disclaim membership in a group with any other person or persons; (iv) BB Offshore and BB filed the Schedule 13G/A jointly with the other filers but not as a group, and each expressly disclaims membership in a group; (v) each of Eastbourne, Mr. Barry, BB Offshore and BB disclaimed beneficial ownership of the reported shares except to the extent of their pecuniary interest therein. The foregoing table also includes the following shares purchased on February 13, 2003: 301,308 shares purchased by BB Offshore, 98,928 shares purchased by BB, and 16,430 shares purchased by Black Bear Fund II, L.L.C.

(2) According to a Schedule 13/G filed January 16, 2003: (i) Kopp Investment Advisors, Inc. ("KIA") is an investment adviser registered under the Investment Advisers Act of 1940, KIA is wholly owned by Kopp Holding Company ("KHC"), and KHC is wholly owned by Mr. Leroy C. Kopp ("Mr. Kopp"); (ii) KIA reported sole voting power over 923,000 shares, sole dispositive power over 725,000 shares and shared dispositive power over 1,951,051; (iii) KHC reported beneficial ownership of 1,951,051 shares; (iv) Mr. Kopp reported beneficial ownership of 2,088,551 shares, of which Mr. Kopp reported sole voting and dispositive power over 137,500 shares; (v) of the shares beneficially owned by KIA, KHC, and Mr. Kopp, 1,926,051 are held in a fiduciary or representative capacity. The foregoing table also includes 333,333 shares purchased by Kopp Emerging Growth Fund on February 13, 2003.

(3) In a Schedule 13G filed on January 8, 2003, Mr. Haywood reported sole voting and dispositive power over 1,398,000 shares and shared voting and dispositive power over 24,200 shares, including 8,200 shares owned by his

spouse and 16,000 shares owned jointly with his mother. The foregoing table also includes 166,666 shares purchased by Mr. Haywood on February 13, 2003.

(4) According to a Schedule 13D filed on February 24, 2003: (i) each of Domain Partners V, L.P., a Delaware limited partnership ("DP V"), and DP V Associates, a Delaware limited partnership ("DP V A"), are limited partnerships whose principal business is that of a private investment partnership; (ii) the sole general partner of DP V and DP V A is One Palmer Square Associates V, L.L.C., a Delaware limited liability company ("OPSA V"), whose principal business is that of acting as the general partner of DP V and DP V A; (iii) James C. Blair, Brian H. Dovey, Jesse I. Treu, Kathleen K. Schoemaker, Arthur J. Klausner and Robert J. More are the managing members of OPSA V (the "Managing Members"); (iv) the Managing Members may be deemed to share the power to vote or direct the voting of and to dispose or to direct the disposition of the shares owned by DP V and DP V A; (v) the Managing Members disclaim beneficial ownership of the shares owned by DP V and DP V A other than the shares he or she may own directly, if any, or by virtue of his or her indirect pro rata interest, as a Managing Member of OPSA V, in the shares owned by DP V and/or DP V A; (vi) DP V reported sole voting and dispositive power over 927,848 shares; (vii) DP V A reported sole voting and dispositive power over 21,918 shares; and (viii) DP V and DP V A may constitute a "group" within the meaning of Section 13(d)(3) of the Securities Act of 1934, as amended.

(5) According to a Schedule 13G/A filed on February 19, 2003: (i) Dr. Rosenwald is an investment banker, venture capitalist, fund manager and sole stockholder and chairman of Paramount Capital Asset Management, Inc., a Delaware corporation; (ii) Dr. Rosenwald reported sole voting and dispositive power over 396,111 shares and shared voting and dispositive power over 521,169 shares; and (iii) the reported shares include: (a) 521,169 shares of which Paramount Capital may be deemed the owner; (b) 152,157 shares of which Aries Domestic may be deemed the beneficial owner; (c) 32,534 shares of which Aries II may be deemed the beneficial owner; (d) 336,478 shares of which Aries Fund may be deemed the beneficial owner; and (e) 31,785 shares which Dr. Rosenwald has the right to purchase under options exercisable within 60 days.

(6) Includes the following shares of common stock issuable under stock options that are exercisable within 60 days after March 14, 2003: Rachesky - 36,258 shares; Roth - 398,333 shares; Neff - 403,040 shares; Clarke -

135,417 shares; MacMaster - 71,139 shares; Hamilton - 26,402 shares Zopf - 79,791 shares; Sears - 44,632 shares; Hurley - 54,958 shares; Vergis - 42,917; Poul - 8,125; Wyatt - 9,505; Gage - 0; and all current directors and executive officers as a group - 1,380,491 shares.

(7) Includes (i) 210,526 shares of common stock held by MHR Capital Partners LP, (ii) 502,759 shares of common stock held by MRL Partners LP, and (iii) 42,105 shares of common stock held by OTT LLC. Dr. Rachesky is the managing member of MHR Advisors LLC, which is the General Partner of MHR Capital Partners and MRL Partners. Dr. Rachesky is the managing member of OTT LLC. Dr. Rachesky may be deemed to have voting and investment control over the shares held by MHR Capital Partners, MRL Partners, and OTT LLC. Dr. Rachesky disclaims beneficial ownership of the shares held by MHR Capital Partners, MRL Partners, and OTT LLC, except to the extent of his pecuniary interest in the funds.

(8) Includes 100,000 shares of common stock owned by Dr. Roth's wife and 15,758 shares of common stock owned by Dr. Roth's daughter. Dr. Roth disclaims beneficial ownership of the shares held by his wife and daughter.

(9) Includes 1,000 shares of common stock owned by Mr. Neff's wife. Mr. Neff disclaims beneficial ownership of the shares held by his wife.

(10) Excludes 43,070 shares of common stock which are exercisable within 60 days under options that were transferred by Dr. Hamilton in December 2002 pursuant to a domestic relations order. Dr. Hamilton disclaims beneficial interest in the transferred options.

(11) Includes 21,324 shares of common stock owned by the Sears Family Living Trust, of which Mr. Sears is trustee.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS.

In May 2001, we entered into a tuition reimbursement agreement with A. Brian Davis, who serves as our Vice President, Finance. Under the agreement, we agreed to lend Mr. Davis the amounts necessary to pay for tuition payments and related costs and fees for an MBA degree. Interest accrues on the loan at 4.71% per year, and is payable annually beginning in May 2002. We have agreed to forgive repayment of the principal amount outstanding in four equal, annual installments commencing in May 2004 if he remains employed by us on each forgiveness date. We will forgive the accrued interest as it becomes due and, if Mr. Davis is terminated without cause, we will forgive all outstanding principal and interest. As of December 31, 2002, the amount outstanding under the agreement, including accrued interest, was $121,000.

ITEM 14. CONTROLS AND PROCEDURES.

Within 90 days prior to the date of this report, we carried out an evaluation, under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, of the effectiveness of the design and operation of our disclosure controls and procedures, and our internal controls and procedures for financial reporting. Based on that evaluation, our principal executive officer and principal financial officer concluded that these controls and procedures are effective. There were no significant changes in these controls or procedures, or in other factors that could significantly affect these controls or procedures, subsequent to the date of their evaluation.

Our disclosure controls and procedures are designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the rules and forms of the Securities and Exchange Commission. These disclosure controls and procedures include, among other things, controls and procedures designed to ensure that information required to be disclosed by us in the reports that we file under the Exchange Act is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate to allow timely decisions regarding required disclosure. Our internal controls and procedures for financial reporting are designed to provide reasonable assurance, and management believes that they provide such reasonable assurance, that our transactions are properly authorized, our assets are safeguarded against unauthorized or improper use, and our

transactions are properly recorded and reported, in order to permit the preparation of our financial statements in conformity with generally accepted accounting principles.

Our management group, including our principal executive officer and principal financial officer, does not expect that our disclosure controls and internal controls and related procedures will prevent all error and all fraud. A control system, no matter how well designed and implemented, can provide only reasonable assurance that the objectives of the control system are met. In addition, the design and implementation of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered in relation to their costs. The design of any system of controls is based, in part, upon certain assumptions about the likelihood of future events, which may prove to be incorrect. Due to the limitations of all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within an organization have been detected.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES, AND REPORTS ON FORM 8-K.

(a) 1. Financial Statements.

The Financial Statements filed as part of this Annual Report on Form 10-K are listed on the Index to Financial Statements on page F-1.

2. Financial Statement Schedules.

All financial statement schedules have been omitted here because they are not applicable, not required, or the information is shown in the Financial Statements or Notes thereto.

3. Exhibits. (See (c) below)

(b) Reports on Form 8-K.

On October 30, 2002, the Company filed a report on Form 8-K, announcing under Item 5 that its board of directors approved an amendment to the Amended and Restated Rights Agreement between the Company and American Stock Transfer & Trust Company, as Rights Agent, effective as of December 3, 1998 (the "Rights Agreement"), permitting a specified significant stockholder to increase its percentage of beneficial ownership in the Company to more than 15% but less than 25%, without being deemed an Acquiring Person under the Rights Agreement.

On December 12, 2002, the Company filed a report on Form 8-K, announcing under Item 5 that on that date its board of directors adopted new corporate governance principles and a new charter of the Corporate Governance Committee.

(c) Exhibits.

The following is a list of exhibits filed as part of this Annual Report on Form 10-K. We are incorporating by reference to our previous SEC filings each exhibit that contains a footnote. For exhibits incorporated by reference, the location of the exhibit in the previous filing is indicated in parentheses.

Exhibit Number	Description
3.1	Second Amended and Restated Certificate of Incorporation. (Exhibit 3.1)(1)
3.2	Second Amended and Restated By-Laws. (Exhibit 3.2)(10)
3.3	Certificate of Designation establishing and designating the Series A Junior Participating Preferred Stock. (Exhibit 3.2)(3)
4.1	See Exhibits 3.1, 3.2, and 3.3 for instruments defining rights of holders of common stock.
4.2	Representation pursuant to Item 601(b)(4)(iii)(A) of Regulation S-K. (Exhibit 4.1)(2)
4.3	Trust Indenture, dated as of March 1, 1997, between Montgomery County Industrial Development Authority and Dauphin Deposit Bank and Trust Company. (Exhibit 4.2)(2)
4.4	Form of Montgomery County Industrial Development Authority Federally Taxable Variable Rate Demand Revenue Bond (Neose Technologies, Inc. Project) Series B of 1997. (Exhibit 4.3)(2)
4.5	Amended and Restated Rights Agreement, dated as of December 3, 1998, between American Stock Transfer & Trust Company, as Rights Agent, and Neose Technologies, Inc. (Exhibit 4.1)(4)
4.6	Amendment No. 1, dated November 14, 2000, to the Amended and Restated Rights Agreement, dated as of December 3, 1998, between Neose Technologies, Inc. and American Stock Transfer & Trust Company, as Rights Agent. (Exhibit 4.1)(7)

4.7	Amendment No. 2, dated June 13, 2002, to the Amended and Restated Rights Agreement, dated as of December 3, 1998, between Neose Technologies, Inc. and American Stock Transfer & Trust Company, as Rights Agent. (Exhibit 4.1)(13)
4.8	Amendment No. 3, dated October 30, 2002, to the Amended and Restated Rights Agreement, dated as of December 3, 1998, between Neose Technologies, Inc. and American Stock Transfer & Trust Company, as Rights Agent. (Exhibit 4.1)(15)
10.1*	Amended and Restated License Agreement, dated as of February 27, 2003, between University of Pennsylvania and Neose Technologies, Inc.
10.2++	1995 Amended and Restated Stock Option/Stock Issuance Plan, as amended. (Exhibit 99.1)(12)
10.3++	Amended and Restated Employee Stock Purchase Plan. (Exhibit 99.2)(12)
10.4++	Employment Agreement, dated March 29, 2002, between C. Boyd Clarke and Neose Technologies, Inc. (Exhibit 10.1)(11)
10.5++	Non-Qualified Stock Option Agreement, dated March 29, 2002, between C. Boyd Clarke and Neose Technologies, Inc. (Exhibit 10.2)(11)
10.6++	Separation and Consulting Agreement, dated March 29, 2002, between Stephen A. Roth and Neose Technologies, Inc. (Exhibit 10.3)(11)
10.7++	Employment Letter Agreement, dated August 15, 2002, between Robert I. Kriebel and Neose Technologies, Inc. (Exhibit 10.3)(14)
10.8++	Change of Control Agreement, dated October 7, 2002, between Robert I. Kriebel and Neose Technologies, Inc. (Exhibit 10.4)(14)
10.9++	Employment Agreement, dated September 12, 2002, between Joseph J. Villafranca and Neose Technologies, Inc. (Exhibit 10.5)(14)
10.10++*	Form of Change of Control Agreement between Neose Technologies, Inc. and Certain Officers. (Exhibit 10.1)(14)
10.11++	Change of Control Agreement, dated October 7, 2002, between Debra J. Poul and Neose Technologies, Inc. (Exhibit 10.2)(14)
10.12	Loan Agreement, dated as of March 1, 1997, between Montgomery County Industrial Development Authority and Neose Technologies, Inc. (Exhibit

	10.1)(2)
10.13	Participation and Reimbursement Agreement, dated as of March 1, 1997, between Jefferson Bank and CoreStates Bank, N.A. (Exhibit 10.2)(2)
10.14	Form of CoreStates Bank, N.A. Irrevocable Letter of Credit. (Exhibit 10.3)(2)
10.15	Pledge, Security and Indemnification Agreement, dated as of March 1, 1997, by and among CoreStates Bank, N.A., Jefferson Bank, and Neose Technologies, Inc. (Exhibit 10.4)(2)
10.16	Reimbursement Agreement, dated as of March 1, 1997, between Jefferson Bank and Neose Technologies, Inc. (Exhibit 10.5)(2)
10.17	Specimen of Note from Company to Jefferson Bank. (Exhibit 10.6)(2)
10.18	Mortgage, Assignment and Security Agreement, dated March 20, 1997, between Jefferson Bank and Neose Technologies, Inc. (Exhibit 10.7)(2)
10.19	Security Agreement, dated as of March 1, 1997, by and between Jefferson Bank and Neose Technologies, Inc. (Exhibit 10.8)(2)
10.20	Assignment of Contract, dated as of March 20, 1997, between Jefferson Bank and Neose Technologies, Inc. (Exhibit 10.9)(2)
10.21	Custodial and Collateral Security Agreement, dated as of March 20, 1997, by and among Offitbank, Jefferson Bank, and Neose Technologies, Inc. (Exhibit 10.10)(2)
10.22	Placement Agreement, dated March 20, 1997, among Montgomery County Industrial Development Authority, CoreStates Capital Markets, and Neose Technologies, Inc. (Exhibit 10.11)(2)
10.23	Remarketing Agreement, dated as of March 1, 1997, between CoreStates Capital Markets and Neose Technologies, Inc. (Exhibit 10.12)(2)
10.24	Operating Agreement of Magnolia Nutritionals LLC, dated October 12, 1999, between Neose Technologies, Inc. and McNeil PPC, Inc. acting through its division McNeil Specialty Products Company. (Exhibit 99.2)(5)
10.25+	Collaboration and License Agreement, dated November 3, 1999, between Neose Technologies, Inc. and American Home Products Corporation. (Exhibit 99.3)(5)

10.26	Modification Agreement Relating To Reimbursement Agreements, dated as of May 1, 2000, between Hudson United Bank, Jefferson Bank Division, successor to Jefferson Bank, and Neose Technologies, Inc. (Exhibit 10.1)(6)
10.27	Modification Agreement Relating to Custodial Bank Agreement, dated as of May 1, 2000, by and among Offitbank, Hudson United Bank, Jefferson Bank Division, successor to Jefferson Bank, and Neose Technologies, Inc. (Exhibit 10.2)(6)
10.28	Amendment No. 1 to Research and Development Agreement, dated May 14, 2001, between Neose Technologies, Inc. and Progenics Pharmaceuticals, Inc. (as successor to the Pharmaceutical Research Institute of Bristol-Myers Squibb Company). (Exhibit 99.2)(9)
10.29	Agreement of Lease, dated as of February 15, 2002, between Liberty Property Leased Partnership and Neose Technologies, Inc. (Exhibit 10.40)(10)
10.30	Standard Industrial/Commercial Multi-Tenant Lease-Net, dated February 2, 2001, between Nancy Ridge Technology Center, LLC and Neose Technologies, Inc. (Exhibit 10.47)(10)
10.31	First Amendment to Lease, dated May 18, 2001, between Nancy Ridge Technology Center, LLC and Neose Technologies, Inc. (Exhibit 10.48)(10)
10.32	Agreement, dated as of August 24, 2001, between IPS and Neose Technologies, Inc. (Exhibit 10.49)(10)
10.33*	Master Security Agreement between General Electric Capital Corporation and Neose Technologies, Inc., dated as of December 19, 2002.

10.34*	Amendment to Master Security Agreement between General Electric Capital Corporation and Neose Technologies, Inc., dated as of December 19, 2002.
10.35*	Promissory Note of Neose Technologies, Inc. to General Electric Capital Corporation, dated December 27, 2002
10.36*	Common Stock Purchase Agreement between Neose Technologies, Inc. and the Purchasers, dated as of February 13, 2003
23.1*	Consent of KPMG LLP
23.2*	Information Regarding Consent of Arthur Andersen LLP
24*	Powers of Attorney (included as part of signature page hereof).
99.1*	Certification Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
99.2*	Certification Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.

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* Filed herewith.

\+ Portions of this Exhibit were omitted and filed separately with the Secretary of the SEC pursuant to an order of the SEC granting our application for confidential treatment filed pursuant to Rule 406 under the Securities Act.

++ Compensation plans and arrangements for executives and others.

\# Portions of this Exhibit were omitted and filed separately with the Secretary of the SEC pursuant to a request for confidential treatment that has been filed with the SEC.

(1) Filed as an Exhibit to our Registration Statement on Form S-1 (Registration No. 33-80693) filed with the SEC on December 21, 1995, as amended.

(2) Filed as an Exhibit to our Quarterly Report on Form 10-Q for the quarterly period ended March 31, 1997.

(3) Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on October 1, 1997.

(4) Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on January 8, 1999.

(5) Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on February 2, 2000.

(6) Filed as an Exhibit to our Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2000.

(7) Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on November 15, 2000.

(8) Filed as an Exhibit to our Annual Report on Form 10-K for the year ended December 31, 2000.

(9) Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on May 18, 2001.

(10) Filed as an Exhibit to our Annual Report on Form 10-K filed with the SEC on March 29, 2002.

(11) Filed as an Exhibit to our Current Report on Form 8-K/A filed with the SEC on April 30, 2002.

(12) Filed as an Exhibit to our Proxy Statement filed with the SEC on May 15, 2002.

(13) Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on June 13, 2002.

(14) Filed as an Exhibit to our Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2002.

(15) Filed Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on October 31, 2002.

SIGNATURES

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

NEOSE TECHNOLOGIES, INC.

Date: March 17, 2003 By: /s/ C. Boyd Clarke
C. Boyd Clarke
President and Chief Executive Officer

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

Each person, in so signing also makes, constitutes, and appoints C. Boyd Clarke, Robert I. Kriebel and A. Brian Davis, and each of them acting alone, as his or her true and lawful attorneys-in-fact, with full power of substitution, in his name, place, and stead, to execute and cause to be filed with the Securities and Exchange Commission any or all amendments to this report.

Name	Capacity	Date
/s/ C. Boyd Clarke C. Boyd Clarke	President and Chief Executive Officer (Principal Executive Officer)	March
/s/ Robert I. Kriebel Robert I. Kriebel	Senior Vice President and Chief Financial Officer (Principal Financial Officer)	March
/s/ L. Patrick Gage L. Patrick Gage	Director	March
/s/ William F. Hamilton William F. Hamilton	Director	March
/s/ Douglas J. MacMaster, Jr. Douglas J. MacMaster, Jr.	Director	March
/s/ P. Sherrill Neff P. Sherrill Neff	Director	March
/s/ Mark H. Rachesky Mark H. Rachesky	Director	March
/s/ Stephen A. Roth Stephen A. Roth	Chairman	March
/s/ Lowell E. Sears	Director	March

Lowell E. Sears

/s/ Elizabeth H.S. Wyatt Director March

Elizabeth H.S. Wyatt

CERTIFICATIONS

CERTIFICATION OF CHIEF EXECUTIVE OFFICER

I, C. Boyd Clarke, certify that:

1. I have reviewed this annual report on Form 10-K of Neose Technologies, Inc.

2. Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this annual report;

3. Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this annual report;

4. The registrant's other certifying officers and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-14 and 15d-14) for the registrant and we have:

   a) designed such disclosure controls and procedures to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;

   b) evaluated the effectiveness of the registrant's disclosure controls and procedures as of a date within 90 days prior to the filing date of this annual report (the "Evaluation Date"); and

   c) presented in this annual report our conclusions about the effectiveness of the disclosure controls and procedures based on our evaluation as of the Evaluation Date;

5. The registrant's other certifying officers and I have disclosed, based on our most recent evaluation, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent function):

   a) all significant deficiencies in the design or operation of internal controls which could adversely affect the registrant's ability to record, process, summarize and report financial data and have identified for the registrant's auditors any material weaknesses in internal controls; and

b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal controls; and

6. The registrant's other certifying officers and I have indicated in this annual report whether or not there were significant changes in internal controls or in other factors that could significantly affect internal controls subsequent to the date of our most recent evaluation, including any corrective actions with regard to significant deficiencies and material weaknesses.

March 17, 2003	/s/ C. Boyd Clarke
Date	C. Boyd Clarke President and Chief Executive Officer

CERTIFICATION OF CHIEF FINANCIAL OFFICER

I, Robert I. Kriebel, certify that:

1. I have reviewed this annual report on Form 10-K of Neose Technologies, Inc.

2. Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this annual report;

3. Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this annual report;

4. The registrant's other certifying officers and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-14 and 15d-14) for the registrant and we have:

   a) designed such disclosure controls and procedures to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;

   b) evaluated the effectiveness of the registrant's disclosure controls and procedures as of a date within 90 days prior to the filing date of this annual report (the "Evaluation Date"); and

   c) presented in this annual report our conclusions about the effectiveness of the disclosure controls and procedures based on our evaluation as of the Evaluation Date;

5. The registrant's other certifying officers and I have disclosed, based on our most recent evaluation, to the registrant's auditors and the audit committee of registrant's board of directors (or persons

performing the equivalent function):

a) all significant deficiencies in the design or operation of internal controls which could adversely affect the registrant's ability to record, process, summarize and report financial data and have identified for the registrant's auditors any material weaknesses in internal controls; and

b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal controls; and

6. The registrant's other certifying officers and I have indicated in this annual report whether or not there were significant changes in internal controls or in other factors that could significantly affect internal controls subsequent to the date of our most recent evaluation, including any corrective actions with regard to significant deficiencies and material weaknesses.

March 17, 2003	/s/ Robert I. Kriebel
Date	Robert I. Kriebel Senior Vice President and Chief Financial Officer

Index to Financial Statements

INDEPENDENT AUDITORS' REPORT

The Board of Directors and Stockholders
Neose Technologies, Inc.:

We have audited the accompanying balance sheet of Neose Technologies, Inc. (a development-stage company) as of December 31, 2002, and the related statements of operations, stockholders' equity and comprehensive loss, and cash flows for the year then ended, and for the period from January 17, 1989 (inception) through December 31, 2002. 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 audit. The financial

statements of Neose Technologies, Inc. as of December 31, 2001 and for each of the years in the two-year period ended December 31, 2001 and for the period from January 17, 1989 (inception) through December 31, 2002, to the extent related to the period from January 17, 1989 (inception) through December 31, 2001, were audited by other auditors who have ceased operations. Those auditors expressed an unqualified opinion on those financial statements in their report dated January 25, 2002. Our opinion on the statements of operations, stockholders' equity and comprehensive loss, and cash flows, insofar as it relates to the amounts included for the period from January 17, 1989 (inception) through December 31, 2001, is based solely on the report of the other auditors.

We conducted our audit in accordance with auditing standards generally accepted in the United States of America. 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 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 audit provides a reasonable basis for our opinion.

In our opinion, based on our audit and the report of other auditors, the 2002 financial statements referred to above present fairly, in all material respects, the financial position of Neose Technologies, Inc. (a development-stage company) as of December 31, 2002, and the results of its operations and its cash flows for the year then ended, and for the period from January 17, 1989 (inception) through December 31, 2002, in conformity with accounting principles generally accepted in the United States of America.

/s/ KPMG LLP

Philadelphia, Pennsylvania
February 19, 2003

The following is a copy of a report issued by Arthur Andersen LLP and included in the 2001 Form 10-K/A report for the fiscal year ended December 31, 2001 filed on April 30, 2002. This report has not been reissued by Arthur Andersen LLP, and Arthur Andersen LLP has not consented to its use in this Annual Report on Form 10-K. For further discussion, see Exhibit 23.2 to this Form 10-K.

Report of Independent Public Accountants

To Neose Technologies, Inc.:

We have audited the accompanying consolidated balance sheets of Neose Technologies, Inc. (a Delaware corporation in the development stage) and subsidiaries as of December 31, 2000 and 2001, and the related consolidated statements of operations, stockholders' equity and comprehensive loss, and cash flows for each of the three years in the period ended December 31, 2001, and for the period from inception (January 17, 1989) to December 31, 2001. 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 auditing standards generally accepted in the United States. 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 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 financial position of Neose Technologies, Inc. and subsidiaries as of December 31, 2000 and 2001, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2001, and for the period from inception (January 17, 1989) to December 31, 2001, in conformity with accounting principles generally accepted in the United States.

ARTHUR ANDERSEN LLP
Philadelphia, Pennsylvania
January 25, 2002

Neose Technologies, Inc.
(a development-stage company)
Balance Sheets
(in thousands, except per share amounts)

Assets	December 31, 2001	December 31, 2002
Current assets:		
Cash and cash equivalents	$ 76,245	$ 31,088
Marketable securities	--	9,952
Restricted funds	902	977
Prepaid expenses and other current assets	1,635	558
Total current assets	78,782	42,575
Property and equipment, net	22,649	36,508
Acquired intellectual property, net	3,105	2,507
Other assets	1,250	1,502
Total assets	$ 105,786	$ 83,092
Liabilities and Stockholders' Equity		
Current liabilities:		
Current portion of long-term debt	$ 1,100	$ 1,851
Accounts payable	719	1,127
Accrued compensation	855	1,339
Accrued expenses	2,844	1,880
Deferred revenue	1,222	320
Total current liabilities	6,740	6,517

Long-term debt	5,100	5,560
Other liabilities	--	330
Total liabilities	11,840	12,407
Commitments (Note 13)		
Stockholders' equity:		
Preferred stock, $.01 par value, 5,000 shares authorized, none issued	--	--
Common stock, $.01 par value, 30,000 shares authorized; 14,089 and 14,330 shares issued; 14,083 and 14,324 shares outstanding	141	143
Additional paid-in capital	176,124	178,945
Treasury stock, 6 shares at cost	(175)	(175)
Deferred compensation	(503)	(170)
Deficit accumulated during the development stage	(81,641)	(108,058)
Total stockholders' equity	93,946	70,685
Total liabilities and stockholders' equity	$ 105,786	$ 83,092

The accompanying notes are an integral part of these financial statements.

Neose Technologies, Inc.
(a development-stage company)

Statements of Operations
(in thousands, except per share amounts)

	Year Ended December 31,			Period fr inceptio (January 1989) t December
	2000	2001	2002	2002
Revenue from collaborative agreements	$ 4,600	$ 1,266	$ 4,813	$ 17,
Operating expenses:				
Research and development	12,094	14,727	18,879	97,
Marketing, general and administrative	5,648	8,631	12,390	47,
Severance	--	873	2,722	3,
Total operating expenses	17,742	24,231	33,991	148,

Operating loss	(13,142)	(22,965)	(29,178)	(131,
Other income	--	6,120	1,653	7,
Interest income	5,111	3,704	1,108	18,
Interest expense	(469)	(188)	--	(3,
Net loss	$ (8,500)	$ (13,329)	$ (26,417)	$ (108,
Basic and diluted net loss per share	$ (0.63)	$ (0.95)	$ (1.85)	
Weighted-average shares outstanding used in computing basic and diluted net loss per share	13,428	14,032	14,259	

The accompanying notes are an integral part of these financial statements.

Neose Technologies, Inc.
(a development-stage company)

Statements of Stockholders' Equity and Comprehensive Loss
(in thousands)

	Convertible Preferred Stock		Common Stock		Add pa
	Shares	Amount	Shares	Amount	ca
Balance, January 17, 1989 (inception)	--	$ --	--	$ --	$
Initial issuance of common stock	--	--	1,302	13	
Shares issued pursuant to consulting, licensing, and antidilutive agreements	--	--	329	3	
Sale of common stock	--	--	133	1	
Net loss	--	--	--	--	
Balance, December 31, 1990	--	--	1,764	17	
Sale of stock	1,517	15	420	4	
Shares issued pursuant to consulting and antidilutive agreements	--	--	145	1	
Capital contributions	--	--	--	--	
Dividends on preferred stock	--	--	--	--	
Net loss	--	--	--	--	
Balance, December 31, 1991	1,517	15	2,329	22	
Sale of stock	260	2	17	--	
Shares issued pursuant to redemption of notes payable	--	--	107	1	
Exercise of stock options and					

warrants	--	--	21	--	
Amortization of deferred compensation	--	--	--	--	
Dividends on preferred stock	--	--	--	--	
Net loss	--	--	--	--	
Balance, December 31, 1992	1,777	17	2,474	23	
Sale of preferred stock	250	3	--	--	
Shares issued to licensor	--	--	3	--	
Shares issued to preferred stockholder in lieu of cash dividends	--	--	1	--	
Amortization of deferred compensation	--	--	--	--	
Dividends on preferred stock	--	--	--	--	
Net loss	--	--	--	--	
Balance, December 31, 1993	2,027	20	2,478	23	
Sale of preferred stock	2,449	25	--	--	
Exercise of stock options	--	--	35	1	
Shares issued to preferred stockholder in lieu of cash dividends	--	--	10	1	
Dividends on preferred stock	--	--	--	--	
Net loss	--	--	--	--	
Balance, December 31, 1994	4,476	$ 45	2,523	$ 25	$

	Deferred compensation	Deficit accumulated during the development stage	Unrealized gains on marketable securities	Comprehensive loss accumulated during the development stage
Balance, January 17, 1989 (inception)	$ --	$ --	$ --	$ --
Initial issuance of common stock	--	--	--	--
Shares issued pursuant to consulting, licensing, and antidilutive agreements	--	--	--	--
Sale of common stock	--	--	--	--
Net loss	--	(460)	--	(460)
Balance, December 31, 1990	--	(460)	--	(460)
Sale of stock	(7)	--	--	--
Shares issued pursuant to consulting and antidilutive agreements	--	--	--	--
Capital contributions	--	--	--	--
Dividends on preferred stock	--	--	--	--
Net loss	--	(1,865)	--	(1,865)
Balance, December 31, 1991	(7)	(2,325)	--	(2,325)
Sale of stock	--	--	--	--
Shares issued pursuant to redemption of notes payable	--	--	--	--
Exercise of stock options and				

warrants	--	--	--	--
Amortization of deferred compensation	5	--	--	--
Dividends on preferred stock	--	--	--	--
Net loss	--	(3,355)	--	(3,355)
Balance, December 31, 1992	(2)	(5,680)	--	(5,680)
Sale of preferred stock	--	--	--	--
Shares issued to licensor	--	--	--	--
Shares issued to preferred stockholder in lieu of cash dividends	--	--	--	--
Amortization of deferred compensation	2	--	--	--
Dividends on preferred stock	--	--	--	--
Net loss	--	(2,423)	--	(2,423)
Balance, December 31, 1993	--	(8,103)	--	(8,103)
Sale of preferred stock	--	--	--	--
Exercise of stock options	--	--	--	--
Shares issued to preferred stockholder in lieu of cash dividends	--	--	--	--
Dividends on preferred stock	--	--	--	--
Net loss	--	(6,212)	--	(6,212)
Balance, December 31, 1994	$ --	$ (14,315)	$ --	$(14,315)

(continued)

The accompanying notes are an integral part of these financial statements.

Neose Technologies, Inc.
(a development-stage company)

Statements of Stockholders' Equity and Comprehensive Loss
(continued)
(in thousands)

	Convertible Preferred Stock		Common Stock		Additional paid-in	Tr
	Shares	Amount	Shares	Amount	capital	s
Sale of preferred stock	2,721	$ 27	--	$ --	$10,065	
Exercise of stock options and warrants	--	--	116	1	329	
Shares issued to employees in lieu of cash compensation	--	--	8	--	44	
Deferred compensation related to grant of stock options	--	--	--	--	360	
Shares issued to stockholder related to the initial public offering	--	--	23	--	--	

Shares issued to preferred stockholder in lieu of cash dividends	--	--	3	--	18
Dividends on preferred stock	--	--	--	--	(36)
Conversion of preferred stock into common stock	(1,417)	(14)	472	5	9
Net loss	--	--	--	--	--
Balance, December 31, 1995	5,780	58	3,145	31	31,386
Dividends on preferred stock	--	--	--	--	(18)
Sale of common stock in initial public offering	--	--	2,588	26	29,101
Conversion of preferred stock into common stock	(5,780)	(58)	2,411	24	34
Exercise of stock options and warrants	--	--	65	1	162
Shares issued pursuant to employee stock purchase plan	--	--	6	--	60
Stock-based compensation related to modification of options	--	--	--	--	106
Amortization of deferred compensation	--	--	--	--	--
Net loss	--	--	--	--	--
Balance, December 31, 1996	--	--	8,215	82	60,831
Sale of common stock in public offering	--	--	1,250	13	20,326
Exercise of stock options and warrants	--	--	42	--	139
Shares issued pursuant to employee stock purchase plan	--	--	18	--	189
Deferred compensation related to grants of stock options	--	--	--	--	322
Amortization of deferred compensation	--	--	--	--	--
Net loss	--	--	--	--	--
Balance, December 31, 1997	--	$ --	9,525	$ 95	$81,807

	Deficit accumulated during the development stage	Unrealized gains on marketable securities	Comprehensive loss accumulated during the development stage
Sale of preferred stock	$ --	$ --	$ --
Exercise of stock options and warrants	--	--	--
Shares issued to employees in lieu of cash compensation	--	--	--
Deferred compensation related to grant of stock options	--	--	--
Shares issued to stockholder related to the initial public offering	--	--	--
Shares issued to preferred stockholder in lieu of cash			

dividends	--	--	--
Dividends on preferred stock	--	--	--
Conversion of preferred stock into common stock	--	--	--
Net loss	(5,067)	--	(5,067)
Balance, December 31, 1995	(19,382)	--	(19,382)
Dividends on preferred stock	--	--	--
Sale of common stock in initial public offering	--	--	--
Conversion of preferred stock into common stock	--	--	--
Exercise of stock options and warrants	--	--	--
Shares issued pursuant to employee stock purchase plan	--	--	--
Stock-based compensation related to modification of options	--	--	--
Amortization of deferred compensation	--	--	--
Net loss	(6,141)	--	(6,141)
Balance, December 31, 1996	(25,523)	--	(25,523)
Sale of common stock in public offering	--	--	--
Exercise of stock options and warrants	--	--	--
Shares issued pursuant to employee stock purchase plan	--	--	--
Deferred compensation related to grants of stock options	--	--	--
Amortization of deferred compensation	--	--	--
Net loss	(9,064)	--	(9,064)
Balance, December 31, 1997	$(34,587)	$ --	$(34,587)

(continued)

The accompanying notes are an integral part of these financial statements.

Neose Technologies, Inc.
(a development-stage company)

Statements of Stockholders' Equity and Comprehensive Loss
(continued)
(in thousands)

	Convertible Preferred Stock	Common Stock	Additional paid-in	Treasury	Deferred	ac d de

	Shares	Amount	Shares	Amount	capital	stock	compensation
Exercise of stock options	--	$ --	49	$ 1	$ 261	$ --	$ --
Shares issued pursuant to employee stock purchase plan	--	--	15	--	171	--	--
Deferred compensation related to grants of stock options	--	--	--	--	161	--	(161)
Amortization of deferred compensation	--	--	--	--	--	--	311
Unrealized gains on marketable securities	--	--	--	--	--	--	--
Net loss	--	--	--	--	--		--
Balance, December 31, 1998	--	--	9,589	96	82,400	--	(211)
Sales of common stock in private placements	--	--	1,786	18	17,398	--	--
Exercise of stock options and warrants	--	--	43	--	263	--	--
Shares issued pursuant to employee stock purchase plan	--	--	16	--	156	--	--
Deferred compensation related to grants of stock options	--	--	--	--	796	--	(796)
Amortization of deferred compensation	--	--	--	--	--	--	477
Unrealized gains on marketable securities	--	--	--	--	--	--	--
Net loss	--	--	--	--	--	--	--
Balance, December 31, 1999	--	--	11,434	114	101,013		(530)
Sale of common stock in public offering	--	--	2,300	23	68,582	--	--
Exercise of stock options and warrants	--	--	247	3	2,735	--	--
Shares issued pursuant to employee stock purchase plan	--	--	11	--	157	--	--
Deferred compensation related to grants of employee stock options	--	--	--	--	70	--	(70)
Deferred compensation related to non-employee stock options	--	--	--	--	1,200	--	(1,200)
Amortization of deferred compensation related to:							
Employee options	--	--	--	--	--	--	70
Non-employee options	--	--	--	--	--	--	1,013
Net loss	--	--	--	--	--	--	--
Balance, December 31, 2000	--	$ --	13,992	$ 140	$ 173,757	$ --	$ (717)

(continued)

The accompanying notes are an integral part of these financial statements.

Neose Technologies, Inc.
(a development-stage company)

Statements of Stockholders' Equity and Comprehensive Loss
(continued)
(in thousands)

	Convertible Preferred Stock		Common Stock		Additional paid-in	Treasu
	Shares	Amount	Shares	Amount	capital	stock
Exercise of stock options and warrants	--	$ --	79	$ 1	$ 867	$ --
Shares issued pursuant to employee stock purchase plan	--	--	18	--	335	--
Acquisition of treasury stock, 6 shares at cost	--	--	(6)	--	--	(175
Deferred compensation related to grants of employee stock options	--	--	--	--	299	--
Deferred compensation related to non-employee stock options	--	--	--	--	75	--
Stock-based compensation related to modifications of options	--	--	--	--	791	--
Amortization of deferred compensation related to:						
Employee options	--	--	--	--	--	--
Non-employee options	--	--	--	--	--	--
Net loss	--	--	--	--	--	--
Balance, December 31, 2001	--	--	14,083	141	176,124	(175
Exercise of stock options and warrants	--	--	209	2	1,575	--
Shares issued pursuant to employee stock purchase plan	--	--	32	--	384	--
Deferred compensation related to grants of employee stock options	--	--	--	--	118	--
Deferred compensation related to non-employee stock options	--	--	--	--	(878)	--
Stock-based compensation related to modification of options	--	--	--	--	1,622	--
Amortization of deferred compensation related to:						
Employee options	--	--	--	--	--	--
Non-employee options	--	--	--	--	--	--
Net loss	--	--	--	--	--	--
Balance, December 31, 2002	--	$ --	14,324	$ 143	$ 178,945	$ (175

	Deferred compensation	Deficit accumulated during the development stage	Unrealized gains on marketable securities	Comprehen loss accumu during t developme stage
Exercise of stock options and warrants	$ --	$ --	$ --	$
Shares issued pursuant to employee stock purchase plan	--	--	--	
Acquisition of treasury stock, 6 shares at cost	--	--	--	
Deferred compensation related to grants of employee stock options	(299)	--	--	
Deferred compensation related to non-employee stock options	(75)	--	--	
Stock-based compensation related to modifications of options	--	--	--	
Amortization of deferred compensation related to:				
Employee options	125	--	--	
Non-employee options	463	--	--	
Net loss	--	(13,329)	--	(13,3
Balance, December 31, 2001	(503)	(81,641)	--	(81,6
Exercise of stock options and warrants	--	--	--	
Shares issued pursuant to employee stock purchase plan	--	--	--	
Deferred compensation related to grants of employee stock options	(118)	--	--	
Deferred compensation related to non-employee stock options	878	--	--	
Stock-based compensation related to modification of options	--	--	--	
Amortization of deferred compensation related to:				
Employee options	171	--	--	
Non-employee options	(598)	--	--	
Net loss	--	(26,417)	--	(26,4
Balance, December 31, 2002	(170)	$ (108,058)	--	$ (108,0

The accompanying notes are an integral part of these financial statements.

Neose Technologies, Inc.
(a development-stage company)

Statements of Cash Flows
(in thousands)

	Year ended December 31,		
	2000	2001	2
Cash flows from operating activities:			
Net loss	$ (8,500)	$ (13,329)	$ (
Adjustments to reconcile net loss to cash used in operating activities:			
Depreciation and amortization	2,051	2,422	
Non-cash compensation	1,083	1,379	
Common stock issued for non-cash and other charges	-	-	
Changes in operating assets and liabilities:			
Prepaid expenses and other current and non-current assets	(465)	(1,052)	
Accounts payable	(154)	636	
Accrued compensation	146	254	
Accrued expenses	(405)	(208)	
Deferred revenue	(416)	833	
Other liabilities	-	-	
Net cash used in operating activities	(6,660)	(9,065)	(
Cash flows from investing activities:			
Purchases of property and equipment	(1,455)	(9,371)	(
Proceeds from sale-leaseback of equipment	-	-	
Purchases of marketable securities	(81,077)	(103,465)	(
Proceeds from sales of marketable securities	-	-	
Proceeds from maturities of and other changes in marketable securities	76,174	131,238	
Purchase of acquired technology	(1,000)	-	
Investment in equity securities	(1,250)	-	
Restricted cash related to acquired technology	1,500	-	
Net cash provided by (used in) investing activities	(7,108)	18,402	(
Cash flows from financing activities:			
Proceeds from issuance of debt	-	-	
Repayment of debt	(1,000)	(1,100)	
Restricted cash related to debt	(108)	(9)	
Proceeds from issuance of preferred stock, net	-	-	
Proceeds from issuance of common stock, net	68,762	335	
Proceeds from exercise of stock options and warrants	2,738	868	
Acquisition of treasury stock	-	(175)	
Dividends paid	-	-	
Net cash provided by (used in) financing activities	70,392	(81)	

Net increase (decrease) in cash and cash equivalents	56,624	9,256	(
Cash and cash equivalents, beginning of period	10,365	66,989	
Cash and cash equivalents, end of period	$ 66,989	$ 76,245	$
Supplemental disclosure of cash flow information:			
Cash paid for interest	$ 481	$ 284	$
Non-cash investing activities:			
Increase (decrease) in accrued property and equipment	$ 220	$ 1,525	$
Non-cash financing activities:			
Issuance of common stock for dividends	$ -	$ -	$
Issuance of common stock to employees in lieu of cash compensation	$ -	$ -	$

The accompanying notes are an integral part of these financial statements.

Neose Technologies, Inc.
(a development-stage company)

Notes to Financial Statements

Note 1. Background

We are a biopharmaceutical company focused on improving glycoprotein therapeutics using our proprietary technologies. We are using our GlycoAdvance(TM), GlycoPEGylation(TM) and GlycoConjugation(TM) technologies to develop improved versions of currently marketed drugs with proven efficacy and to improve therapeutic profiles of glycoproteins in development for our partners. We expect these next generation proteins to offer significant advantages over drugs that are now on the market, potentially including less frequent dosing and improved safety and efficacy. In addition to developing our own products or co-developing products with others, we expect to enter into strategic partnerships for including our technologies into the product design and manufacturing processes of other biotechnology and pharmaceutical companies. While our primary goal is protein drug development, our technologies offer multiple opportunities to participate in the evolving therapeutic protein market by addressing other challenges, such as manufacturing efficiency, manufacturing consistency, and the use of non-mammalian cell expression systems. Neose was initially incorporated in January 1989, and began operations in October 1990.

In February 2003, we sold approximately 2.9 million shares of common stock in a private placement to a group of institutional and individual investors at a price of $6.00 per share, generating net proceeds of approximately $16.3 million.

Note 2. Summary of Significant Accounting Policies

Basis of Presentation

In December 2002, we dissolved our subsidiaries and, therefore, are no longer presenting our financial statements on a consolidated basis.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires us to make estimates and assumptions. Those estimates and assumptions affect the reported amounts of assets and liabilities as of the date of the financial statements, the disclosure of contingent assets and liabilities as of the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Cash and Cash Equivalents

We consider all highly liquid investments with a maturity of three months or less on the date of purchase to be cash equivalents. As of December 31, 2001 and 2002, cash equivalents consisted of securities and obligations of either the U.S. Treasury or U.S. government agencies. Our cash balances have been kept on deposit primarily at one bank and in amounts greater than $100,000, which is the limit of insurance provided by the Federal Deposit Insurance Corporation.

Marketable Securities

Marketable securities consist of investments that have a maturity of more than three months on the date of purchase. To help maintain the safety and liquidity of our marketable securities, we have established guidelines for the concentration, maturities, and credit ratings of our investments.

We determine the appropriate classification of our debt securities at the time of purchase and re-evaluate such designation as of each balance sheet date. Marketable securities that we have the positive intent and ability to hold to maturity are classified as held-to-maturity securities and recorded at amortized cost.

As of December 31, 2002, we held a marketable security that was an obligation of a U.S. government agency. The security, which is classified as held-to-maturity, had an original maturity of 11 months. The security's amortized cost, which was $9,952,000, as of December 31, 2002 includes $200,000 of accrued interest. The security's fair value as of December 31, 2002 was $9,979,000. Additionally, there was $341,000 of interest earned throughout 2002 on securities that matured during the year.

Restricted Funds

We are required to make monthly payments to an escrow account to provide for an annual prepayment of principal of our Industrial Development Authority bonds (see Note 6). As of December 31, 2002, we had restricted funds of $1.0 million, which consisted of our monthly payments to the escrow account plus interest earned on the balance of the escrow account.

Property and Equipment

Property and equipment are stated at cost. Property and equipment capitalized under capital leases are recorded at the present value of the minimum lease payments due over the lease term. Depreciation and amortization

are provided using the straight-line method over the estimated useful lives of the related assets or the lease term, whichever is shorter. We generally use depreciable lives of three to seven years for laboratory and office equipment, and three to twenty years for building and improvements. Expenditures for maintenance and repairs are charged to expense as incurred, and expenditures for major renewals and improvements are capitalized.

Impairment of Long-Lived Assets

As required by Statement of Financial Accounting Standards No. 144, "Accounting for the Impairment or Disposal of Long-Lived Assets," we assess the recoverability of long-lived assets for which an indicator of impairment exists. Specifically, we calculate, and recognize, any impairment losses by comparing the carrying value of these assets to our estimate of the undiscounted future operating cash flows. Although our current and historical negative cash flows are indicators of impairment, we believe the future cash flows to be received from our long-lived assets will exceed the assets' carrying value. Accordingly, we have not recognized any impairment losses through December 31, 2002.

Revenue Recognition

Revenue from collaborative agreements consists of up-front fees, research and development funding, and milestone payments. In accordance with Staff Accounting Bulletin No. 101, "Revenue Recognition in Financial Statements" (SAB 101), non-refundable up-front fees are deferred and amortized to revenue over the related estimated performance period. Periodic payments for research and development activities are recognized over the period in which we perform those activities under the terms of each agreement. Revenue resulting from the achievement of milestone events stipulated in the agreements is recognized when the milestone is achieved.

Research and Development

Research and development costs are charged to expense as incurred.

Income Taxes

We account for income taxes under the asset and liability method in accordance with Statement of Financial Accounting Standards No. 109, "Accounting for Income Taxes." Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

Net Loss Per Share

Basic loss per share is computed by dividing net loss by the weighted-average number of common shares outstanding for the period. Diluted

loss per share reflects the potential dilution from the exercise or conversion of securities into common stock. For the years ended December 31, 2000, 2001, and 2002, the effects of the exercise of outstanding stock options were antidilutive; accordingly, they were excluded from the calculation of diluted earnings per share. See Note 9 for a summary of outstanding options.

Comprehensive Loss

Our comprehensive loss for the years ended December 31, 2000, 2001, and 2002 was approximately $8.5 million, $13.3 million, and $26.4 million, respectively. Comprehensive loss is comprised of net loss and other comprehensive income or loss. Our only source of other comprehensive income or loss is unrealized gains and losses on our marketable securities that are classified as available-for-sale.

Fair Value of Financial Instruments

As of December 31, 2002, the carrying values of cash and cash equivalents, restricted funds, accounts receivable, accounts payable, accrued expenses, and accrued compensation approximate their respective fair values. In addition, we believe the carrying value of our debt instruments, which do not have readily ascertainable market values, approximates their fair values.

Stock-based Compensation

We apply the intrinsic value method of accounting for all stock-based employee compensation in accordance with APB Opinion No. 25, "Accounting for Stock Issued to Employees" (APB 25), and related interpretations. We record deferred compensation for option grants to employees for the amount, if any, by which the market price per share exceeds the exercise price per share. In addition, we apply fair value accounting for option grants to non-employees in accordance with Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation" (SFAS 123), and Emerging Issues Task Force Issue 96-18, "Accounting for Equity Instruments That Are Issued to Other Than Employees for Acquiring, or in Conjunction with Selling, Goods or Services" (EITF 96-18).

We have elected to adopt only the disclosure provisions of SFAS 123, as amended by Statement of Financial Accounting Standards No. 148, "Accounting for Stock-Based Compensation - Transition and Disclosure." The following table illustrates the effect on our net loss and basic and diluted net loss per share if we had recorded compensation expense for the estimated fair value of our stock-based employee compensation, consistent with SFAS 123 (in thousands, except per share data):

Year Ended December 31,	2000	2001	
Net loss - as reported	$ (8,500)	$ (13,329)	$ (2
Add: Stock-based employee compensation expense included in reported net loss	70	125	

Deduct: Total stock-based employee compensation expense determined under fair value-based method for all awards	(3,752)	(8,179)	(1
Net loss - pro forma	$ (12,182)	$ (21,383)	$ (4
Basic and diluted net loss per share - as reported	$ (0.63)	$ (0.95)	$
Basic and diluted net loss per share - pro forma	$ (0.91)	$ (1.52)	$

Recent Accounting Pronouncements

Statement of Financial Accounting Standard No. 143, "Accounting for Asset Retirement Obligations" (SFAS 143), which was released in August 2001, addresses financial accounting and reporting for obligations associated with the retirement of tangible long-lived assets and their associated asset retirement costs. SFAS 143 requires an enterprise to record the fair value of an asset retirement obligation as a liability in the period in which it incurs a legal obligation associated with the retirement of intangible long-lived assets that result from the acquisition, construction, development, or normal use of the asset. The enterprise is also required to record a corresponding increase to the carrying amount of the related long-lived asset (i.e. the associated asset retirement cost) and to depreciate that cost over the life of the asset. The liability is changed at the end of each period to reflect the passage of time (i.e. accretion expense) and changes in the estimated future cash flows underlying the initial fair value measurement. Because of the extensive use of estimates, most enterprises will record a gain or loss when they settle the obligation. We are required to adopt SFAS 143 for our fiscal year beginning January 1, 2003; we do not expect the adoption of SFAS 143 to have a material impact on our financial position or results of operations.

In April 2002, the Financial Accounting Standards Board ("FASB") issued SFAS No. 145, "Rescission of FASB Statements No. 4, 44 and 64, Amendment of FASB Statement No. 13, and Technical Corrections" (SFAS 145). SFAS 145 amends existing guidance on reporting gains and losses on the extinguishment of debt to prohibit the classification of the gain or loss as extraordinary, as the use of such extinguishments have become part of the risk management strategy of many companies. SFAS 145 also amends SFAS 13 to require sale-leaseback accounting for certain lease modifications that have economic effects similar to sale-leaseback transactions. The provisions of the Statement related to the rescission of Statement No. 4 are applied in fiscal years beginning after May 15, 2002. Earlier application of these provisions is encouraged. The provisions of the Statement related to Statement No. 13 were effective for transactions occurring after May 15, 2002. The adoption of SFAS 145 is not expected to have a material effect on our financial statements.

In June 2002, the FASB issued Statement of Financial Accounting Standard No. 146, "Accounting for Exit or Disposal Activities" (SFAS 146). SFAS 146 addresses significant issues regarding the recognition, measurement and reporting of costs associated with exit and disposal activities, including restructuring activities. SFAS 146 also addresses recognition of certain costs related to terminating a contract that is not a capital lease, costs to consolidate

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facilities or relocate employees and termination of benefits provided to employees that are involuntarily terminated under the terms of a one-time benefit arrangement that is not an ongoing benefit arrangement or an individual deferred compensation contract. SFAS 146 is effective for exit or disposal activities that are initiated after December 31, 2002. Adoption of SFAS 146 is not expected to have a material impact on our financial position or results of operations.

In November 2002, the FASB issued Interpretation No. 45, "Guarantor's Accounting and Disclosure Requirements for Guarantees, Including Indirect Guarantees of Indebtedness to Others, an interpretation of FASB Statements No. 5, 57 and 107 and a rescission of FASB Interpretation No. 34." This Interpretation elaborates on the disclosures to be made by a guarantor in its interim and annual financial statements about its obligations under guarantees issued. The Interpretation also clarifies that a guarantor is required to recognize, at inception of a guarantee, a liability for the fair value of the obligation undertaken. The initial recognition and measurement provisions of the Interpretation are applicable to guarantees issued or modified after December 31, 2002, and are not expected to have a material effect on our financial statements.

In December 2002, the FASB issued SFAS No. 148, "Accounting for Stock-Based Compensation - Transition and Disclosure, an amendment of FASB Statement No. 123." This Statement amends FASB Statement No. 123, "Accounting for Stock-Based Compensation," to provide alternative methods of transition for a voluntary change to the fair value method of accounting for stock-based employee compensation. In addition, this Statement amends the disclosure requirements of Statement No. 123 to require prominent disclosures in both annual and interim financial statements. Certain of the disclosure modifications are required for fiscal years ending after December 15, 2002, and are included in Notes 2 and 9.

In January 2003, the FASB issued Interpretation No. 46, "Consolidation of Variable Interest Entities, an interpretation of ARB No. 51." This Interpretation addresses the consolidation by business enterprises of variable interest entities as defined in the Interpretation. The Interpretation applies immediately to variable interests in variable interest entities created after January 31, 2003, and to variable interests in variable interest entities obtained after January 31, 2003. Because we have no involvement with any variable interest entities, the application of this Interpretation is not expected to have a material effect on our financial statements.

Reclassification

Certain prior year amounts have been reclassified to conform to our current year presentation.

Note 3. Property and Equipment

Property and equipment consisted of the following (in thousands):

December 31,	2001	2002
Building and improvements	$ 14,482	$ 14,872
Laboratory and office equipment	8,227	8,964
Land	700	700
Construction-in-progress	8,196	21,440
	31,605	45,976

Less accumulated depreciation	(8,956)	(9,468)
	$ 22,649	$ 36,508

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The construction in progress amounts represent amounts incurred related to improvements to our existing facility in Horsham, Pa. and to a newly-leased facility in Horsham, Pa. During 2001 and 2002, we incurred $8.2 million and $9.2 million, respectively, for the construction and validation of our cGMP facility at our existing Horsham location. Our cGMP facility was placed in-service in January 2003. Of the total cost of $17.4 million, $13.1 million is considered building improvements and will be depreciated over 20 years and $4.3 million is laboratory equipment and will be depreciated over seven years. Separately, in 2002 we incurred $4.0 million for the design and renovations of our newly leased facility in Horsham. We then suspended plans to complete these renovations and we have not yet made a final decision as to when or if we will resume this project. To the extent that we determine the partially completed renovations are of no future use to us, we would be required to recognize an impairment loss in our statement of operations.

In 2001 and 2002, we capitalized $70,000 and $150,000, respectively, of interest expense in connection with our facility improvement projects. Depreciation expense was approximately $1.5 million, $1.8 million, and $2.3 million for the years ended December 31, 2000, 2001, and 2002, respectively. In 2002, we wrote off $1.8 million of fully depreciated laboratory and office equipment.

Note 4. Acquired Intellectual Property

In 1999, we acquired the carbohydrate-manufacturing patents, licenses, and other intellectual property of Cytel Corporation for aggregate consideration of $4.8 million. The acquired intellectual property consists of core technology with alternative future uses.

The acquired intellectual property balance is being amortized to research and development expense in our statement of operations over eight years, which is the estimated useful life of the technology. Amortization expense relating to the acquired intellectual property for the years ended December 31, 2000, 2001, and 2002 was approximately $0.5 million, $0.6 million, and $0.6 million, respectively.

Note 5. Other Assets

Investment in Convertible Preferred Stock

In 2000, we made an investment of approximately $1.3 million in convertible preferred stock of Neuronyx, Inc., and entered into a research and development collaboration with Neuronyx for the discovery and development of drugs for treating Parkinson's disease and other neurological diseases. The collaboration agreement provides for each of Neose and Neuronyx to perform and fund specific tasks, and to share in any financial benefits of the collaboration. We incurred research and development expense related to this collaboration of $352,000, $1,045,000, and $297,000 for the years ended December

31, 2000, 2001, and 2002, respectively. Our equity investment, which represents an ownership interest of less than 1%, was made on the same terms as other unaffiliated investors. Accordingly, we have recorded and carry our investment at cost. We will continue to evaluate the realizability of this investment and record, if necessary, appropriate impairments in value. No such impairments have occurred as of December 31, 2002.

Receivable from Related Party

In 2001, we entered into a tuition reimbursement agreement with an employee who subsequently became an executive officer. Under the agreement, we agreed to lend the amounts necessary to pay for the employee's tuition payments and related costs and fees for an MBA degree. Interest accrues on the loan at 4.71% per year, and is payable annually beginning in May 2002. We have agreed to forgive repayment of the principal amount outstanding in four equal, annual installments commencing in May 2004 if the employee remains employed by us on each forgiveness date. We will forgive the accrued interest as it becomes due and, if the employee is terminated without cause, we will forgive all outstanding principal and interest. As of December 31, 2001 and 2002, the amounts outstanding under the agreement, including accrued interest, were $72,000 and $121,000, respectively.

Note 6. Long-Term Debt

Long-term debt consisted of the following (in thousands):

December 31,	2001	2002
Industrial development authority bonds	$ 6,200	$ 5,100
Equipment loan	--	2,261
Capital lease obligation	--	50
	6,200	7,411
Less current portion	(1,100)	(1,851)
	$ 5,100	$ 5,560

Minimum principal repayments of long-term debt as of December 31, 2002 were as follows (in thousands): 2003--$1,851; 2004--$1,964; 2005--$926; 2006--$270; 2007--$100; and thereafter--$2,300.

Industrial Development Authority Bonds

In 1997, we issued, through the Montgomery County (Pennsylvania) Industrial Development Authority, $9.4 million of taxable and tax-exempt bonds. The bonds are supported by an AA-rated letter of credit, and a reimbursement agreement between our bank and the letter of credit issuer. The interest rate on the bonds will vary weekly, depending on market rates for AA-rated taxable and tax-exempt obligations, respectively. During 2000, 2001, and 2002, the weighted-average, effective interest rate was 7.5%, 5.3%, and 3.3% per year, including letter-of-credit and other fees.

The terms of the bond issuance provide for monthly, interest-only payments and a single repayment of principal at the end of the twenty-year life of the bonds. However, under our agreement with our bank, we are making monthly payments to an escrow account to provide for an annual prepayment of principal. As of December 31, 2002, we had restricted funds relating to the bonds of $1.0 million, which consisted of our monthly payments to an escrow account plus interest earned on the balance of the escrow account.

To provide credit support for this arrangement, we have given a first mortgage on land, building, improvements, and certain equipment to our bank. The net book value of the pledged assets was $7.6 million as of December 31, 2002. We have also agreed to maintain a minimum required cash and short-term investments balance of at least two times the outstanding loan balance. If we fail to comply with this covenant, we are required to deposit with the lender cash collateral up to, but not more than, the loan's unpaid balance. At December 31, 2002, we were required to maintain $10.2 million of cash and short-term investments.

Equipment Loan

During 2002, we borrowed $2.3 million secured by laboratory equipment, which had a book value of $2.3 million as of December 31, 2002. We are required to make monthly principal and interest payments at an annual rate of 8% over a three-year period ending January 2006.

Capital Lease Obligation

In November 2002, we entered into a capital lease obligation for computer equipment that had a book value of $50,000. The lease has an imputed interest rate of 6.2%. We are required to make monthly payments over a three-year period ending November 2005.

Note 7. Accrued Expenses

Accrued expenses consisted of the following (in thousands):

December 31,	2001	2002
Accrued property and equipment	$ 1,800	$ 102
Accrued outside research expenses	286	573
Accrued professional fees	340	500
Accrued employee relocation	-	315
Accrued other expenses	418	390
	$ 2,844	$ 1,880

Note 8. Stockholders' Equity

Common Stock

In February 2003, we sold approximately 2.9 million shares of common stock in a private placement to a group of institutional and individual investors at a price of $6.00 per share, generating net proceeds of approximately $16.3 million.

In March 2000, we offered and sold 2.3 million shares of our common stock at a public offering price of $32.00 per share. Our net proceeds from the offering after the payment of underwriting fees and offering expenses were approximately $68.6 million.

In June 1999, we sold 1.5 million shares of common stock in a private placement to a group of institutional and individual investors at a price of $9.50 per share, generating net proceeds of approximately $13.4 million. In January 1999, we sold 286,097 shares of common stock to Johnson & Johnson Development Corporation at a price of $13.98 per share, generating net proceeds of $4.0 million.

In January 1997, we sold 1,250,000 shares of common stock in a public offering at a price of $17.50 per share. Our net proceeds from this offering after the payment of placement fees and offering expenses were approximately $20.3 million.

Our initial public offering closed in February 1996. We sold 2,587,500 shares of common stock, which included the exercise of the underwriters' over-allotment option in March 1996, at a price of $12.50 per share. Our net proceeds from this offering after the underwriting discount and payment of offering expenses were approximately $29.1 million. In connection with this offering, all outstanding shares of Series A, C, D, E, and F Convertible Preferred Stock converted into 2,410,702 shares of common stock.

Shareholder Rights Plan

In September 1997, we adopted a Shareholder Rights Plan. Under this plan, which was amended in December 1998, holders of common stock are entitled to receive one right for each share of common stock held.

Separate rights certificates would be issued and become exercisable if any acquiring party either accumulates or announces an offer to acquire at least 15% of our common stock. Each right will entitle any holder who owns less than 15% of our common stock to buy one one-hundredth share of the Series A Junior Participating Preferred Stock at an exercise price of $150. Each one one-hundredth share of the Series A Junior Participating Preferred Stock is essentially equivalent to one share of our common stock. If an acquiring party accumulates at least 15% of our common stock, each right entitles any holder who owns less than 15% of our common stock to purchase for $150 either $300 worth of our common stock or $300 worth of the 15% acquirer's common stock. In November 2000, the Plan was amended to increase the threshold from 15% to 20% for Kopp Investment Advisors, Inc. and related parties. In June 2002 and October 2002, the Plan was amended to increase the threshold to 20% and 25%, respectively, for Eastbourne Capital Management, LLC and related parties. The rights expire in September 2007 and may be redeemed by us at a price of $.01 per right at any time up to ten days after they become exercisable.

Note 9. Compensation Plans

Stock Option Plans

We have three stock option plans, the 1991, 1992, and 1995 Stock Option Plans, under which a total of 5,051,666 shares of common stock have been reserved. In addition, we granted nonqualified stock options outside of these plans in 1995 to two consultants to purchase an aggregate of 69,998 shares and in 2002 to our Chief Executive Officer and President to purchase 487,520 shares. The 1995 Stock Option Plan, which incorporates the two predecessor plans, provides for the granting of both incentive stock options and nonqualified stock options to our employees, officers, directors, and consultants. In addition, the plan allows us to issue shares of common stock directly either through the immediate purchase of shares or as a bonus tied to either an individual's performance or our attainment of prescribed milestones. Incentive stock options may not be granted at an exercise price less than the fair market value on the date of grant. In addition, the plan includes stock appreciation rights to be granted at our discretion. The stock options are exercisable over a period, which may not exceed ten years from the date of grant, determined by our board of directors. A summary of the status of stock options as of December 31, 2000, 2001, 2002, and changes during each of the years then ended, is presented below:

	2000		2001		
	Number Outstanding	Weighted-Average Exercise Price Per Share	Number Outstanding	Weighted-Average Exercise Price Per Share	Numbe Outstan
Balance as of January 1	2,152,037	$ 12.41	2,506,901	$ 16.61	3,112,
Granted	616,140	28.94	789,035	32.48	1,588,
Exercised	(247,501)	11.06	(79,055)	11.28	(209,
Canceled	(13,775)	12.89	(104,625)	27.98	(164,
Balance as of December 31	2,506,901	$ 16.61	3,112,256	$ 20.39	4,326,
Options exercisable as of December 31	1,412,499	$ 12.29	1,782,271	$ 14.86	2,041,

The following table summarizes information about stock options outstanding as of December 31, 2002:

Options Outstanding	Options Exerci

Range of Exercise Prices	Number Outstanding	Weighted-Average Remaining Life (Years)	Weighted-Average Exercise Price	Number Exercisable	We A Ex
$ 0.90 -- $ 5.70	129,342	2.7	$ 3.16	129,342	$
$ 6.06 -- $ 10.47	964,969	9.0	$ 8.45	184,028	$
$10.62 -- $ 15.13	1,193,285	5.7	$ 13.35	957,241	$
$15.25 -- $ 27.40	427,898	6.3	$ 20.60	288,023	$
$28.06 -- $ 41.13	1,611,375	8.7	$ 32.13	483,092	$
	4,326,869	7.5	$ 19.66	2,041,726	$

Fair Value Disclosures

We have elected to adopt only the disclosure provisions of SFAS 123. Accordingly, we apply APB 25 and related interpretations in accounting for our stock-based employee compensation. We record deferred compensation for option grants to employees for the amount, if any, by which the market price per share exceeds the exercise price per share. We amortize deferred compensation over the vesting periods of each option. We recognized $70,000, $125,000, and $171,000 of compensation expense related to employee stock options for the years ended December 31, 2000, 2001, and 2002, respectively. In addition, we recorded approximately $0.8 million and $1.6 million of expense related to the modification of certain stock options to former employees for the years ended December 31, 2001 and 2002. See Note 11 for a description of severance expense.

The weighted-average fair value of options granted in 2000, 2001, and 2002 was $17.49, $22.55, and $12.81, respectively. The fair value of each option grant was estimated on the date of grant using the Black-Scholes option-pricing model. We used the following weighted-average assumptions for 2000, 2001, and 2002 grants, respectively: risk-free interest rate of 4.7%, 4.9%, and 4.2%; expected life of 4.3, 6.1, and 6.7 years; volatility of 75%, 75%, and 80%; and a dividend yield of zero. The weighted-average fair value of employee purchase rights granted under our employee stock purchase plan (see below) in 2000, 2001, and 2002 was $8.45, $11.60, and $15.37, respectively. The fair value of the purchase rights was estimated using the Black-Scholes model with the following weighted-average assumptions for 2000, 2001, and 2002, respectively: risk-free interest rate of 5.0%, 4.6%, and 2.9%; expected life of 14, 16, and 17 months; volatility of 70%, 75%, and 80%; and a dividend yield of zero.

A summary of options granted at exercise prices equal to, greater than, and less than the market price on the date of grant is presented below:

Year Ended December 31,	2000	2001	2002

Exercise Price = Market Value			
Options granted	608,900	610,400	1,578,800
Weighted-average exercise price	$ 29.27	$ 30.96	$ 16.98
Weighted-average fair value	$ 17.56	$ 21.29	$ 12.79
Exercise Price ** Market Value			
Options granted	--	--	--
Weighted-average exercise price	$ --	$ --	$ --
Weighted-average fair value	$ --	$ --	$ --
Exercise Price * Market Value			
Options granted	7,240	178,635	9,921
Weighted-average exercise price	$ 4.83	$ 37.67	$ 6.00
Weighted-average fair value	$ 11.54	$ 26.85	$ 15.46

Non-employee Stock Options

During the years ended December 31, 2000 and 2001, we recognized approximately $1.0 million and $463,000 of compensation expense in connection with the vesting of stock options granted to non-employees. During the year ended December 31, 2002, we recognized a gain of approximately $0.6 million in connection with the vesting of stock options granted to non-employees. The compensation expense or gain was based on each option's estimated fair value, which was calculated using the Black-Scholes option-pricing model. Because we re-value each option over the related vesting term in accordance with EITF 96-18, increases in our stock price result in increased expense while decreases in our stock price result in a gain. At December 31, 2002, our closing stock price was lower than at December 31, 2001 and, therefore, we recognized a gain during 2002.

Employee Stock Purchase Plan

We maintain an employee stock purchase plan, or ESPP, for which 150,000 shares are reserved for issuance. The ESPP allows any eligible employee the opportunity to purchase shares of our common stock through payroll deductions. The ESPP provides for successive, two-year offering periods, each of which contains four semiannual purchase periods. The purchase price at the end of each purchase period is 85% of the lower of the market price per share on the employee's entry date into the offering period or the market price per share on the purchase date. Any employee who owns less than 5% of our common stock may purchase up to the lesser of:

- 10% of his or her eligible compensation;
- 1,000 shares per purchase; or
- the number of shares per year that does not exceed the quotient of $25,000 divided by the market price per share on the employee's entry date into the offering period.

A total of 35,163 shares of common stock remained available for issuance under the ESPP as of December 31, 2002. The total purchases of common stock under the ESPP during the years ended December 31, 2000, 2001, and 2002, were 10,990 shares at a total purchase price of approximately $0.2 million, 17,790 shares at a total

* means less than
** means greater than

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purchase price of approximately $0.3 million, and 32,149 shares at a total purchase price of approximately $0.4 million, respectively. We have not recorded any compensation expense for the ESPP.

401(k) Plan

We maintain a 401(k) Savings Plan (401(k) Plan) for our employees. Employee contributions are voluntary and are determined on an individual basis, with a maximum annual amount equal to the lesser of the maximum amount allowable under federal income tax regulations or 15% of the participant's compensation. We match employee contributions up to specified limits. We contributed $113,000, $149,000, and $176,000 to the 401(k) Plan for the years ended December 31, 2000, 2001, and 2002, respectively.

Note 10. Revenues from Collaborative Agreements

Our revenues from collaborative agreements have historically been derived from a few major collaborators. Our collaborative agreements have had some or all of the following elements: up-front fees, research and development funding, milestone revenues, and royalties on product sales. The amount of revenues from collaborators that accounted for at least 10% of our collaborative revenues in each of the years ended December 31, 2000, 2001, and 2002 are listed in the following table (in thousands):

Year Ended December 31,	2000	2001	2002
Bristol-Myers	$ 3,320	$ --	$ --
Wyeth	1,167	1,167	4,472
Other collaborators	113	99	341
	$ 4,600	$ 1,266	$ 4,813

During 2002, we recognized $3.8 million related to one of our Wyeth collaborations, which was terminated in September 2002. Of this amount, $1.0 million was non-cash, and represented the recognition of a $1.0 million up-front fee, which we received from Wyeth in December 2001. As required under SAB 101, we deferred the up-front fee and began to amortize this amount as revenue over the expected performance period of the related Wyeth agreement.

Note 11. Severance Expense

We incurred severance expense of approximately $0.9 million and $2.7 million during the years ended December 31, 2001 and 2002, respectively, in connection with the separation of employees from Neose. For 2002, approximately $0.6 million was paid during 2002, approximately $0.5 million is reflected in accrued compensation and other liabilities in our balance sheet as of December 31, 2002 and will be paid through December 2006, and approximately $1.6 million was a non-cash charge related to the modification of stock options. For 2001, $82,000 was paid during the year and approximately $0.8 million was a non-cash charge related to the modifications of stock options.

In March 2002, we entered into a Separation and Consulting Agreement with our former Chief Executive Officer. Under this agreement, we agreed to provide medical benefits to Dr. Roth and to pay him $39,622 per month for twelve

months. During 2002, we recorded severance expense related to this agreement of $309,000, which represented the present value of his future benefit payments. On or before the first anniversary of the agreement, Dr. Roth may agree to extend his non-competition and non-solicitation commitments for two additional years by entering into a separate non-competition agreement. If he does so, we will continue his medical benefits for an additional six months, extend the monthly payment of $39,622 for 24 additional months, and continue his stock

option vesting and exercisability during the additional two-year period. If Dr. Roth enters into the separate non-competition agreement, we will record a liability in the amount of the present value of the future payments and a corresponding asset for the value of the non-competition commitment. The asset would be amortized over the two-year term of the agreement.

In January 2002, we entered into a retirement agreement with our Vice President, Research. Under the agreement, he terminated his employment effective June 30, 2002. We have committed to pay a retirement benefit over a five-year period. We will continue to provide Dr. McGuire health insurance benefits through December 31, 2003. During 2002, we recorded severance expense related to this agreement of approximately $0.5 million, which represented the present value of his future retirement benefit. In addition, we extended the period during which he may exercise his stock options and recorded a non-cash severance charge of approximately $1.6 million associated with this option modification.

Note 12. Other Income

In 2000, we invested approximately $0.6 million in an 8% convertible subordinated debenture, which included a warrant to purchase shares of common stock, issued by Novazyme Pharmaceuticals, Inc. The investment was charged to expense in the statement of operations for 2000 due to uncertainty regarding realizability. In March 2001, Novazyme committed to pay us approximately $1.7 million in November 2002 in exchange for restructuring our agreement. In accordance with Statement of Financial Accounting Standards No. 115, "Accounting for Certain Investments in Debt and Equity Securities," we did not record the $1.7 million due to uncertainty regarding the fair value of the note, thereby reducing our cost basis to zero. In September 2001, Genzyme General acquired Novazyme. As a result, we exercised our warrant to purchase shares of Novazyme, converted our debenture into shares of Novazyme, and exchanged our shares of Novazyme for shares of Genzyme. In 2001, we realized a gain on the sale of Genzyme shares of approximately $6.1 million, which has been reflected as other income in our statement of operations. Genzyme also assumed Novazyme's obligation to pay us approximately $1.7 million. In November 2002, Genzyme paid us $1.7 million, which resulted in the recognition of a gain that has been reflected as other income in our statement of operations.

Note 13. Commitments

Leases

In April 2001, we entered into a lease agreement for approximately 10,000 square feet of laboratory and office space in California. The initial term of the lease ends in March 2006, at which time we have an option to extend the lease for an additional five years. In July 2001, we entered into a lease

agreement for approximately 5,000 square feet of office and warehouse space in Pennsylvania. The lease term expires in December 2004. In February 2002, we entered into a lease agreement for approximately 40,000 square feet of laboratory and office space in Pennsylvania. Our facility rental expense for the years ended December 31, 2000, 2001, and 2002 was approximately $112,000, $248,000, and $583,000, respectively. Minimum future annual payments under our operating lease agreements as of December 31, 2002 were as follows (in thousands): 2003--$761; 2004--$782; 2005--$756; 2006--$519; 2007--$445; and thereafter--$7,602.

License Agreements

We have entered into agreements with various entities under which we have been granted licenses to use patent rights and technology. Typically, these agreements will terminate upon the expiration of the applicable patent rights, and require us to reimburse the licensor for fees related to the acquisition and maintenance of the patents licensed to us. In addition, we usually are required to pay royalties to the licensor based either on sales of applicable products by us or specified license fees, milestone fees, and royalties received by us from sublicensees, or both.

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Note 14. Income Taxes

As of December 31, 2002, we had net operating loss carryforwards for federal and state income tax purposes of approximately $11.7 million and $7.0 million, respectively. In addition, we had federal research and development credit carryforwards of approximately $3.2 million. All of these carryforwards begin to expire in 2004. Approximately $8.1 million of the federal net operating loss carryforwards result from tax deductions related to equity-based compensation, which is considered a capital contribution, and not a tax benefit, for financial reporting purposes. Due to the uncertainty surrounding the realization of the tax benefit associated with our federal and state carryforwards, we have provided a full valuation allowance against this tax benefit. In addition, pursuant to the Tax Reform Act of 1986, the annual utilization of our net operating loss carryforwards will be limited. We do not believe that these limitations will have a material adverse impact on the utilization of our net operating loss carryforwards. The approximate income tax effect of each type of temporary difference and carryforward is as follows (in thousands):

December 31,	2001	2002
Benefit of net operating loss carryforwards	$ 1,141	$ 1,388
Research and development credit carryforwards	2,686	3,217
Capitalized research and development	14,532	17,796
Start-up costs	11,906	15,827
Depreciation and amortization	3,485	5,410
Deferred compensation	1,494	1,978
Accrued expenses not currently deductible	182	534
Deferred revenue	56	102

	35,482	46,252
Valuation allowance	(35,482)	(46,252)
	$ --	$ --

Note 15. Related-Party Transaction

We have a joint venture with McNeil Nutritionals to develop bulking agents for use in the food industry. We account for our investment in the joint venture under the equity method, under which we recognize our share of the income and losses of the joint venture. In 1999, we reduced the carrying value of our initial investment in the joint venture of $345,000 to zero to reflect our share of the joint venture's losses. We recorded this amount as research and development expense in our statement of operations. We will record our share of post-1999 losses of the joint venture only to the extent of our actual or committed investment in the joint venture.

The joint venture developed a process for making fructooligosaccharides and constructed a pilot facility in Athens, Georgia. In 2001, the joint venture closed the pilot facility and is exploring establishing a manufacturing arrangement with a third party to produce this or other bulking agents. As a result, we do not intend to commit the joint venture to make any further investments in facilities.

For the year ended December 31, 2002, the joint venture had a net loss and a loss from continuing operations of approximately $406,000. The joint venture had no revenues during 2002. As of December 31, 2002, the joint venture had no assets, $150,000 of current liabilities, and $8.5 million noncurrent liabilities, which consisted of amounts owed to McNeil Nutritionals.

During the years ended December 31, 2000, 2001, and 2002, we supplied to the joint venture research and development services and supplies, which cost approximately $1.6 million, $0.8 million, and $252,000, respectively,

which were reimbursed to us by the joint venture. These amounts have been reflected as a reduction of research and development expense in our statements of operations. As of December 31, 2002, the joint venture owed us approximately $16,000. We expect to provide fewer research and development services during 2003 compared to 2002, thereby reducing our expected reimbursement from the joint venture.

If the joint venture becomes profitable, we will recognize our share of the joint venture's profits only after the amount of our capital contributions to the joint venture is equivalent to our share of the joint venture's accumulated losses. As of December 31, 2002, the joint venture had an accumulated loss since inception of approximately $10.2 million. Until the joint venture is profitable, McNeil Nutritionals is required to fund, as a non-recourse, no-interest loan to the joint venture, all of the joint venture's aggregate capital expenditures in excess of an agreed-upon amount, and all of the joint venture's operating losses. The loan balance would be repayable by the

joint venture to McNeil Nutritionals over a seven-year period commencing on the earlier of September 30, 2006 or the date on which Neose attains a 50% ownership interest in the joint venture after having had a lesser ownership interest. In the event of any dissolution of the joint venture, the loan balance would be payable to McNeil Nutritionals by the joint venture before any distribution of assets to us. As of December 31, 2002, the joint venture owed McNeil Nutritionals approximately $8.5 million.

Exhibit Index

Exhibit	Description
10.1*	Amended and Restated License Agreement, dated as of February 27, 2003, between University of Pennsylvania and Neose Technologies, Inc.
10.10*	Form of Change of Control Agreement between Neose Technologies, Inc. and Certain Officers.
10.33*	Master Security Agreement between General Electric Capital Corporation and Neose Technologies, Inc., dated as of December 19, 2002.
10.34*	Amendment to Master Security Agreement between General Electric Capital Corporation and Neose Technologies, Inc., dated as of December 19, 2002.
10.35*	Promissory Note of Neose Technologies, Inc. to General Electric Capital Corporation, dated December 27, 2002
10.36*	Common Stock Purchase Agreement between Neose Technologies, Inc. and the Purchasers, dated as of February 13, 2003
23.1*	Consent of KPMG LLP
23.2*	Information Regarding Consent of Arthur Andersen LLP
24*	Powers of Attorney (included as part of signature page hereof).
99.1*	Certification Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
99.2*	Certification Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.

* Filed herewith.