NEOSE TECHNOLOGIES INC
Form 10-K
April 02, 2001

==========

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, 2000 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 Identific

102 Witmer Road Horsham, Pennsylvania	19044
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: (215) 441-5890

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.[ ]

As of March 26, 2001, the aggregate market value of the Common Stock held by non-affiliates of the registrant was approximately $293,250,272 based on the last sale price of the Common Stock as reported by the The Nasdaq Stock Market. For purposes of making this calculation only, the registrant has defined affiliates as including all directors and executive officers of the Company.

As of March 26, 2001, there were 14,012,793 shares of the registrant's Common Stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

The registrant's definitive proxy statement to be filed in connection with solicitation of proxies for its Annual Meeting of Stockholders to be held on June 20, 2001, is incorporated by reference into Part III of this Annual Report on Form 10-K.

==========

TABLE OF CONTENTS

PART I

ITEM 1. BUSINESS.....

ITEM 2. PROPERTIES.....

ITEM 3. LEGAL PROCEEDINGS.....

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

PART II

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

ITEM 6. SELECTED CONSOLIDATED HISTORICAL FINANCIAL DATA.....

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

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

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA.....

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

PART III

ITEM 10. DIRECTORS AND EXECUTIVE OFFICERS OF THE COMPANY.....

ITEM 11. EXECUTIVE COMPENSATION.....

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

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS.....

PART IV

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

NEOSE, GlycoAdvance, GlycoTherapeutics, and GlycoActives are trademarks of Neose Technologies, Inc. This Form 10-K also includes trademarks and trade names of other companies.

PART I

ITEM 1. BUSINESS.

Forward-Looking Statements

Some of the statements in this Annual Report on Form 10-K and the Exhibits contain forward-looking statements within Section 21E of the Securities Exchange Act of 1934. When used in this Form 10-K and the Exhibits, the words "anticipate," "believe," "estimate," "may," "expect," and similar expressions are generally intended to identify forward-looking statements. These forward-looking statements include, among others, the statements in Management's Discussion and Analysis of Financial Condition and Results of Operations about our:

- expectations for increases in operating expenses;
- expectations for increases in research and development and general and administrative expenses in order to develop new products and manufacture commercial quantities of products;
- expectations for the development, manufacturing, and approval of new products;
- expectations for incurring additional capital expenditures to expand our manufacturing capabilities;
- expectations for generating revenue or becoming profitable on a sustained basis;
- ability to enter into additional marketing agreements and the ability of our existing marketing partners to commercialize products incorporating our technologies;
- estimate of the sufficiency of our existing cash and cash equivalents and investments to finance our operating and capital requirements;
- expected losses; and
- expectations for future capital requirements.

Our actual results could differ materially from those results expressed in, or implied by, these forward-looking statements. Potential risks and uncertainties that could affect our actual results include the following:

- our ability to commercialize any of our products or technologies;
- our ability to maintain our existing collaborative arrangements and enter into new collaborative arrangements;
- unanticipated events affecting the willingness or ability of our collaborators to incorporate our technologies into their products;
- our ability to develop commercial-scale manufacturing facilities;
- our ability to protect our proprietary products, know-how, and manufacturing processes;

- unanticipated cash requirements to support current operations or research and development;
- the timing and extent of funding requirements for the activities of our joint venture with McNeil Specialty;
- our ability to attract and retain key personnel; and
- general economic conditions.

These and other risks and uncertainties that could affect our actual results are discussed in greater detail in this Annual Report on Form 10-K. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee future results, events, levels of activity, performance, or achievements. We do not assume responsibility for the accuracy and completeness of the forward-looking statements.

We do not undertake any duty to update after the date of this Annual Report on Form 10-K any of the forward-looking statements in this report to conform them to actual results.

1

Risk Factors

You should carefully consider the risks and uncertainties. If any of the following occur, our business, financial condition, or operating results could be materially harmed. This could cause the trading price of our common stock to decline, and you may lose all or part of your investment.

Risks Related to Our Business

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

We have not yet 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. Even if we or our collaborators commercialize one or more of our technologies or any products that incorporate our technologies, we may not become profitable. Our ability to achieve profitability is dependent on a number of factors, including our ability to complete our development efforts and enter into collaborative agreements with others to incorporate our technologies into their products. Furthermore, our ability to achieve profitability is dependent upon the willingness and ability of our collaborators to incorporate successfully our technologies into, obtain regulatory approval for, and commercialize successfully their product candidates.

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

We have incurred losses each year and, given our planned level of operating expenses, we may continue to incur losses for some time. As of December 31, 2000, we had an accumulated deficit of approximately $68 million. We expect additional losses for some time as we expand research and development efforts, expand manufacturing scale-up activities, and begin sales and marketing activities. We may continue to incur substantial losses even if our revenues increase. As a result, we cannot predict the extent of future losses or the time required for us to achieve profitability, if at all.

We have a 50% ownership interest in a joint venture with McNeil Specialty Products Company, a division of Johnson & Johnson. The joint venture has incurred losses since inception and we expect the joint venture to incur additional losses for some time as it continues research and development efforts, continues start-up efforts for its pilot manufacturing facility, and

begins sales and marketing activities. For the joint venture to become profitable, its manufacturing capacity would have to be significantly expanded. We cannot predict if additional manufacturing capacity will become available, or if such capacity is available, whether the joint venture will be profitable.

Our technologies may prove to be ineffective, or it may be years, if ever, before they lead to commercial products.

Our technologies involve new and unproven approaches. We are developing manufacturing processes based on our enzymatic glycosylation technology platform. We intend to use these processes to manufacture enzymes and sugar nucleotides for use by our potential GlycoAdvance(TM) customers, as well as for our own use in manufacturing complex carbohydrates for our GlycoTherapeutics(TM) and GlycoActives(TM) programs. Most complex carbohydrates sold today are derived from natural sources. There has been only very limited development and commercialization of synthesized complex carbohydrates, in part because of manufacturing limitations. We have limited experience in manufacturing enzymes, sugar nucleotides, and complex carbohydrates. We may face obstacles and difficulties unknown to us today. In addition, we may incur unexpected costs, and the costs associated with manufacturing commercial quantities of these compounds may make commercialization unprofitable. We may fail to overcome the difficulties posed in manufacturing these compounds, or complete successfully all the other activities required to commercialize any enzyme, sugar nucleotide, or complex carbohydrate.

Our success depends upon collaborative relationships, which entail numerous risks.

We intend to rely substantially on collaborative partners to commercialize our broad technology platform. We may be unsuccessful in entering into collaborative agreements for the development and commercialization of products incorporating our technologies, we may not be successful in adapting our technologies to the needs or our collaborative partners, and our collaborators may not be successful in or remain committed to developing or commercializing these products. Unanticipated events may affect the willingness or ability of our collaborators to incorporate our technologies into their products. We cannot be sure that our collaborators will share our perspective on the relative value of our technologies, that they will commit sufficient resources to incorporating our technologies into their programs, or that the use of our technologies will advance as rapidly as it might if we retained complete control of all research, development, regulatory, and commercialization decisions. Our collaborative agreements are generally terminable by our partners on short notice. Suspension or termination of collaborative agreements could have a material and adverse impact on our business, financial conditions, and results of operations.

GlycoAdvance. To date, we have not entered into any major collaboration agreements involving GlycoAdvance, the use of our technologies to address the problem of incomplete or incorrect glycosylation encountered in the manufacture of glycoproteins. Even if we enter into a collaboration agreement involving GlycoAdvance, we may find that our technologies fail to remodel therapeutic glycoproteins to include the proper human sugars. We may also find that our technologies are not scaleable in commercial production processes. Either of these would impede or prevent the pharmaceutical and biotechnology industries' adoption of GlycoAdvance, causing our business, financial condition, and results of operations to be materially and adversely affected. Regardless of the success of our technologies, the success of GlycoAdvance will be dependent on the priorities and actions of our collaborative partners, including their success in obtaining regulatory approval and commercial acceptance of product candidates incorporating our technologies.

GlycoTherapeutics. We have existing collaborative agreements for GlycoTherapeutics with Neuronyx, Inc. and Bristol-Myers Squibb Company.

Under our agreement with Neuronyx, we are responsible for the synthesis and manufacturing scale-up of targeted compounds, using our proprietary technologies for carbohydrate synthesis. We may be unable to complete this development successfully. Even if we successfully complete development of these processes and fulfill all of our obligations under the agreement, Neuronyx may not obtain regulatory approval to market any products. Further, even if Neuronyx obtains regulatory approval to market any of these products, we cannot be sure that any of the products will be commercially successful.

Our agreement with Bristol-Myers involves the development of proprietary technologies that enable the manufacture of two gangliosides for use as the active pharmaceutical ingredients in two cancer vaccines being developed by Bristol-Myers. At Bristol-Myers' request, we have ceased our activities under the agreement until they complete their review of data from a Phase III clinical trial of GMK, one of the cancer vaccines. We do not expect any future payments under this agreement unless Bristol-Myers advises us to resume our activities. Even if Bristol-Myers elects to continue with the collaboration, and we successfully complete development of these processes and fulfill all of our obligations under the agreement, Bristol-Myers may not obtain regulatory approval to market either of these vaccines. Further, even if Bristol-Myers obtains regulatory approval to market either of these vaccines, we cannot be sure that Bristol-Myers will enter into a manufacturing contract with us, that the terms of a future contract with Bristol-Myers will be favorable to us, or that either vaccine will be commercially successful.

GlycoActives. We have collaborative agreements with McNeil Specialty and Wyeth-Ayerst International, a division of American Home Products Corporation. We have committed significant resources and costs in the expectation that these collaborations will become profitable in the future.

The success of our joint venture with McNeil Specialty is dependent upon the joint venture's ability to develop, manufacture, sell, and market successfully complex carbohydrates. If the joint venture is unsuccessful in these efforts, it will not be profitable and our business, financial condition, and results of operations may be materially and adversely affected.

Under our agreement with Wyeth-Ayerst, we are responsible for developing a large-scale manufacturing process for a potential ingredient in infant formula. We may be unable to complete this development successfully. Even if we successfully develop a process and fulfill all of our obligations under the agreement, Wyeth-Ayerst may fail to obtain regulatory approval to market the ingredient. Even if Wyeth-Ayerst obtains regulatory approval for the ingredient, Wyeth-Ayerst may elect not to add the ingredient to its products.

We have limited commercial manufacturing capability and experience, and we may be unable to manufacture the compounds required to commercialize our technologies.

Commercialization of our technologies requires the manufacture of enzymes, sugar nucleotides, and complex carbohydrates. We intend to manufacture enzymes and sugar nucleotides for use by our potential GlycoAdvance customers, as well as for our own use in manufacturing complex carbohydrates for our GlycoTherapeutics and GlycoActives programs. 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 United States Food and Drug Administration, or FDA. Our existing facility is not certified cGMP by the FDA and is not adequate for large-scale, commercial manufacturing.

Therefore, we will need to develop commercial-scale manufacturing facilities meeting cGMP, or depend on our collaborators, licensees, or contract manufacturers.

We intend to expand our manufacturing capacity. This expansion will require significant additional funds and personnel, and compliance with applicable regulations. We intend to pursue this expansion without any assurance that we will receive an adequate return on our investment. We may be unable to design, build, or operate the required facilities. In addition to the normal scale-up risks associated with any manufacturing process, we may face unanticipated problems unique to 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 regulations on cGMP, which are enforced by the FDA through its facilities inspection program. These facilities must pass a plant inspection before the FDA will grant marketing approval for the product. The manufacture of product at these facilities 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 be unable to secure or maintain cGMP approvals. If we change the source or location of supply or modify a manufacturing process, regulatory authorities will require us to demonstrate that the product produced by the new source or from the modified process is equivalent to the product used in any clinical trials that we had conducted.

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

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

Our success will depend in part on our ability to obtain commercially valuable patent claims and to protect our intellectual property. Our patent position is generally uncertain and involves complex legal and factual questions. 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 is 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;
- 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 own patents and patent applications, and have licensed patents and patent applications from a number of institutions. If we commercialize any products manufactured by use of technology licensed from another party, we will be required to make payments as specified in the applicable license agreement. Our business, financial condition, and results of operations may be materially and adversely affected if any of these agreements is terminated.

We may incur substantial costs in asserting any patent rights and in defending suits against us relating to intellectual property rights. Such disputes could substantially delay our product development or commercialization activities. The United States Patent and Trademark Office or a private party could institute an interference proceeding relating to our patents or our patent applications. An adverse decision in any such proceeding could result in the loss of our intellectual property rights.

To facilitate development of our proprietary technology base, we may need to obtain licenses to patents or other proprietary rights from other parties. If we are unable to obtain such licenses, or obtain such licenses on what we consider to be acceptable terms, our research and development efforts may be delayed.

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.

In addition to patents and patent applications, we depend upon trade secrets and proprietary know-how to protect our proprietary technology. We require all employees, consultants, advisors, and collaborators to enter into confidentiality agreements that prohibit the disclosure of confidential information to any other parties. We require that our employees and consultants 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 United States is uncertain and is currently undergoing review and revision in many countries. Further, 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 our or our competitors' foreign patents, which could result in substantial costs and diversion of our efforts. Finally, some of our patent protection in the United States is not available to us in foreign countries due to the laws of those countries.

We are exposed to intense competition from many sources. We operate in an environment of rapid technological change, and we may fall behind our competitors.

Some companies are producing by enzymatic and other means a limited variety of complex carbohydrates. Although we do not believe any of these companies currently has the ability to manufacture a wide variety of human carbohydrate products in quantities sufficient for commercialization, any of these companies may develop technologies superior to our technologies. In addition, some companies are investigating novel methods of chemical synthesis, sometimes with enzymatic steps, to produce commercial quantities of complex carbohydrates. These and other efforts by potential competitors may be successful or other methods of carbohydrate synthesis that compete with our technologies may be

developed.

Our potential competitors include nutritional products, pharmaceutical, chemical, biotechnology, food, and consumer product companies. Many of these companies have more:

- financial, scientific, and technical resources;
- 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 technology that are more effective and less costly than we may develop, or that would render our technology or products, or both, obsolete or noncompetitive. Competitors also may prove to be more successful in the manufacturing and marketing of products. If we are unable to compete against our competitors, our commercial opportunities will be reduced or diminished.

If we fail to retain members of our senior management, we may be unable to achieve success in our research and product development programs.

We depend upon the efforts of our senior management, in particular Dr. Stephen Roth, our Chief Executive Officer. Dr. Roth has entered into a non-competition agreement, under which he has agreed not to compete with us during his employment, and following his employment so long as we pay him compensation to be mutually agreed upon at the time of his termination. If we cannot reach an agreement with Dr. Roth at that time, and he competes with us, we may be unable to achieve our development objectives.

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 and our business.

We are exposed to product liability and related risks.

The administration of drugs to humans, whether in clinical trials or commercially, can result in product liability claims even if our drugs or a collaborator's drugs are not actually at fault for causing an injury. Furthermore, the use of our technologies or products may cause, or may appear to cause, adverse side effects or potentially dangerous drug interactions that we may not learn about or understand fully until the drug is actually manufactured and sold. 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 have no product liability insurance coverage for clinical trials testing any compounds that incorporate our technologies, and 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 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 product candidates manufactured using our technology are subject to significant, but varying, degrees of regulation by a number of government authorities in the United States and other countries.

Regulation of Pharmaceutical Products

Pharmaceutical product candidates manufactured using our technology must undergo an extensive regulatory approval process before commercialization. This process is regulated by the FDA and by comparable agencies in other countries. Our products, and products employing our technology, are regulated in the United States in accordance with the federal Food, Drug and Cosmetic Act, the Public Health Service Act, and other laws. If the product is regulated as a biologic, the FDA Center for Biologics Evaluation and Research, or CBER, will require the submission and approval of a Biologic License Application, or BLA, before commercial marketing. The BLA process generally requires:

- expensive and time-consuming preclinical studies and clinical trials to establish the safety, potency, purity, and effectiveness of each compound to be submitted with the FDA;
- compliance with FDA good laboratory, clinical, and manufacturing practices during testing and manufacturing; and
- continued FDA oversight of product and promotion after marketing approval is obtained.

It may be many years, if ever, until regulatory approval is obtained and regulatory oversight continues after marketing approval for the product is received.

Each manufacturer of drugs or biologics must be registered with the FDA and pass an inspection by the FDA prior to approval to manufacture products for commercial distribution. Failure to pass the inspection results in not receiving approval to market products. A collaborator's use of our GlycoAdvance technologies in the production of their product candidate will require submission of Drug Master Files with CBER. If we or our collaborators fail to comply with all applicable regulatory requirements, the following delays or regulatory action could result:

- warning letters;
- fines;
- product recalls or seizures;
- operating restrictions;
- refusal of the FDA to complete review of pending market approval applications or supplements to approval applications;
- withdrawal of previously approved product approvals;
- civil penalties; and
- criminal prosecution.

We have not submitted, and we may never submit, any pharmaceutical product candidates for marketing approval to the FDA, or any other regulatory authority. In addition, no collaborator has submitted, and may never submit, any product candidate incorporating our technologies for marketing approval to the FDA, or any other regulatory authority.

If any product manufactured using our technology is submitted for regulatory approval, it may not receive either the approvals necessary for

commercialization, the desired labeling claims, or coverage or adequate levels of reimbursement under federal, state, or private healthcare insurance providers. Any delay in receiving, or failure to receive, these approvals would adversely affect our ability to generate product revenues or royalties. Even if all requisite approvals were granted, these approvals may entail commercially unacceptable limitations on the labeling claims. In addition, once an approval is granted, both a marketed drug or compound and the manufacturer are subject to continual review and inspection. Later discovery of previously unknown problems with a product or manufacturer may result in restrictions or regulatory action against the product or manufacturer, including withdrawal of the product from the market. Additional 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.

Regulation of Foods and Food Ingredients

We expect that the products of our joint venture with McNeil Specialty will be regulated as food ingredients. Foods and food ingredients are subject to the provisions of the federal Food, Drug and Cosmetic Act. Food ingredients are broadly defined as any substances that may become a component, or otherwise affect the characteristics, of food. Food ingredients or ingredients used in animal feed are regulated either as substances generally recognized as safe, or GRAS, or as food additives.

Food ingredients that are GRAS are excluded from the definition of food additives. The FDA has affirmed by regulation a number of substances as GRAS, although it is not required that a substance be affirmed as GRAS by regulation of the FDA in order to be GRAS. A manufacturer may self-affirm a substance as GRAS by making an independent determination that qualified experts would generally agree that the substance is GRAS for a particular use. If the FDA disagrees with a determination, the manufacturer must complete the food additive petition process for the substance to be approved by the FDA. Affirmation of GRAS status either by the manufacturer or regulation of the FDA would allow the manufacturer to market and sell the additive or the food containing the additive. Furthermore, a manufacturer's decision to rely on an independent determination may limit the marketability of that manufacturer's products to food manufacturers, many of whom require confirmation of GRAS status from the FDA before they will purchase substances for use in foods from third parties.

Food ingredients that are not GRAS are regulated as food additives. All new food additives require FDA approval prior to commercialization. Information supporting the safety of a food additive is submitted to the FDA in the form of a food additive petition. The food additive petition process is generally expensive and lengthy. Commercialization of the food additive, if permitted by the FDA, often occurs several years after the petition is submitted to the FDA. The petition must establish with reasonable certainty that the food additive is safe for its intended use at the level specified in the petition. The petition is required to contain reports of safety investigations of the food additive and details regarding its physical, chemical, and biological properties. Product safety studies submitted to the FDA are typically conducted in accordance with FDA good laboratory practices requirements. If a food additive petition is submitted, the FDA may choose to reject the petition or deny any desired labeling claims. Furthermore, the FDA may require the establishment of regulations that necessitate costly and time-consuming compliance procedures.

Regulation of Infant Formula Additives

We are collaborating with Wyeth-Ayerst to develop a bioactive carbohydrate

as a potential nutritional additive to infant formula. The manufacture, composition, and labeling of infant formulas are subject to the provisions of the United States Infant Formula Act. Prior to commercializing any potential infant formula additive, an infant formula manufacturer must demonstrate that its potential additive:

- is GRAS by previous regulation of the FDA, or is self-affirmed as GRAS by the infant formula manufacturer; or
- is the subject of an approved food additive petition.

Under the United States Infant Formula Act, infant formula manufacturers are required to notify the FDA of any intent to revise, add, or substitute any protein, fat, or carbohydrate in infant formula ninety days prior to the intended date of commercial distribution. During that ninety-day period, the FDA may request additional information, or deny marketing rights for the new formula. Wyeth-Ayerst is responsible for all regulatory activities relating to the infant formula additive. They have not yet made, and may never make, any filings with the FDA to propose inclusion of an infant formula additive manufactured using our technology. Furthermore, Wyeth-Ayerst may not self-affirm GRAS status of the potential infant formula additive, impairing their efforts to commercialize the infant formula additive.

Wyeth-Ayerst may market infant formula containing the additive in foreign countries. Infant formula regulatory requirements vary widely from country to country, and may be more or less stringent than the FDA requirements. The time required to obtain clearances, if required, in foreign countries may be longer or shorter than that required in the United States.

We use hazardous materials in our operations that may subject us to an environmental claim 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.

BUSINESS

Overview

We develop proprietary technologies for the synthesis and manufacture of complex carbohydrates. Our enzymatic glycosylation technology platform makes feasible the synthesis and modification of a wide range of complex carbohydrates, which are chains of simple sugar molecules that can be joined together in many different combinations. Our methods can produce complex carbohydrates that are attached to proteins, as in recombinant therapeutic glycoproteins, are attached to lipids, as in therapeutic cancer vaccines, or are solely carbohydrates, as found in human breast milk. Our technology is also capable of correcting or completing the human carbohydrate patterns on glycoproteins, potentially resulting in improved pharmacokinetic profile, strengthened patent claims, and manufacturing efficiencies.

Our manufacturing methods offer an alternative to the traditional means of

producing complex carbohydrates. The traditional methods include isolating complex carbohydrates from natural sources and chemical synthesis. Natural sources can be unpredictable, scarce, or unacceptable to regulators. Chemical synthesis of complex carbohydrates can be inefficient and expensive. We believe our enzymatically produced complex carbohydrates are cleaner, more consistent, and less expensive to produce, but are identical to the natural molecule. Our proprietary enzymes, called glycosyltransferases, synthesize specific chemical linkages among individual sugar molecules. We have developed recombinant methods of producing the glycosyltransferases necessary to manufacture many naturally occurring complex carbohydrates.

We are applying our broad technology platform in the following programs:

- GlycoAdvance - the use of our innovative technologies to address the problems of incomplete or incorrect glycosylation encountered in the manufacture of recombinant glycoproteins.
- GlycoTherapeutics - the use of our technology platform to develop and produce novel carbohydrate-based therapeutics.
- GlycoActives - the use of our technology platform to develop and produce novel carbohydrate-based food ingredients.

GlycoAdvance

GlycoAdvance is used to complete and correct critical portions of therapeutic glycoproteins, which are proteins that include carbohydrate structures. Many biotechnology drugs on the market or in development, including monoclonal antibodies, are glycoproteins, and their associated carbohydrates are often critical to the function of the protein. Glycoproteins are produced primarily in Chinese hamster ovary (CHO) cell expression systems. Production in these systems often results in incomplete or incorrect glycosylation. Glycosylation refers both to the linkage pattern of carbohydrate molecules, and to the process of creating or modifying these linkages. The impact of incomplete or incorrect glycosylation can include reduced half-life, greater or more frequent dosing, and increased side effects, of the drug. Incomplete glycosylation can also result in production inefficiencies, including lower production yields, higher manufacturing costs, and increased facilities and equipment requirements. Conventional methods of solving the problems of incomplete or incorrect glycosylation include choosing different cell types for use in cell expression systems, re-engineering cells, optimizing cell culture media, and purifying for final product only the most completely glycosylated compounds. These approaches can be expensive and ineffective.

Our GlycoAdvance program uses our proprietary enzymes to remodel therapeutic glycoproteins, after their production in CHO cell expression systems, to include the proper human sugars. We believe that the use of GlycoAdvance in the production of human therapeutic glycoproteins may result in improved pharmacokinetic profiles, manufacturing efficiencies, and potentially strengthened patent claims. We also believe that GlycoAdvance may permit the continued development of some drugs by overcoming efficacy and side effect problems related to incomplete carbohydrate structures. We have completed a number of feasibility studies for pharmaceutical and biotechnology companies to

demonstrate the utility of GlycoAdvance. We are seeking to enter into collaborative agreements with these companies to use GlycoAdvance in the clinical development and commercialization of their glycoproteins. In general, these glycoproteins are being produced in CHO cell expression systems. In the feasibility studies conducted to date, we have shown that GlycoAdvance can improve the pharmacokinetics, and increase the production efficiency, of these

glycoproteins.

We are pursuing three different business strategies for GlycoAdvance:

- We are seeking to enter into collaborations with companies that are developing glycoproteins to use GlycoAdvance in the clinical development and commercialization of their glycoproteins. We anticipate that GlycoAdvance collaborations would provide for us to receive up-front license fees, annual license fees, milestone payments, royalties, and revenues from the supply of enzymes and sugar nucleotides.
- We are also working with developers of a number of protein production systems other than CHO cell expression systems to enable the human therapeutic use of glycoproteins that are expressed in those systems. These systems, which include transgenic animals, insect cells, yeast, fungi, bacteria, and plants, offer the promise of reduced production costs for glycoproteins. We believe that without incorporating GlycoAdvance into the manufacturing process, however, most human proteins produced in these novel expression systems will have either poor pharmacokinetic activity or will be immunogenic in humans.
- Finally, we are considering internal development of proprietary glycoproteins enhanced with GlycoAdvance. We believe that novel glycosylation, or the use of glycosylation in combination with other molecules, may offer clinical and cost benefits over standard glycoproteins.

GlycoTherapeutics

GlycoTherapeutics is the use of our core technologies to develop and produce novel carbohydrate-based drugs. We are supporting a number of research and development projects on promising, carbohydrate-based therapeutic approaches. We do not intend to proceed beyond early stage clinical trials on any pharmaceutical product without a suitable partner for late stage development and commercialization. Our business strategy is to collaborate with others, allowing us to leverage our proprietary technologies to participate in the profits of successful drugs while assuming limited financial and clinical development risk. If we successfully enter into collaborations with other companies, we anticipate we will receive up-front license fees, annual license fees, milestone payments, royalties, and revenues from the supply of compounds. Due to the long development times inherent in developing pharmaceutical compounds, we do not expect any significant revenues from our GlycoTherapeutics program for at least three years.

Neuronyx, Inc.

We have a research and development collaboration with Neuronyx for the discovery and development of drugs for treating Parkinson's disease and other neurological diseases. We have also made an equity investment of $1.25 million in Neuronyx. Currently, the collaboration is focusing on the modification of certain compounds that have previously demonstrated clinical promise in arresting the progression of Parkinson's disease symptoms. We are responsible for the synthesis and manufacturing scale-up of targeted compounds, using our proprietary technologies for carbohydrate synthesis. Neuronyx is responsible for preclinical and clinical development of the compounds. Neose and Neuronyx will each bear their own research and development costs under the collaboration. If any drugs are commercialized under this collaboration, Neose will be responsible for manufacturing the drug, and would receive a transfer payment and royalty based on sales. Parkinson's disease is a progressive disorder of the central nervous systems affecting approximately 1.5 million Americans. There is no known prevention or cure for Parkinson's disease. Current treatments focus on controlling symptoms of the disease, but do not slow the progression of the disease.

Bristol-Myers

Under our agreement with Bristol-Myers, we are developing proprietary technologies that enable cGMP processes for the manufacture of two gangliosides for use as the active pharmaceutical ingredients in two cancer vaccines being developed by Bristol-Myers. Both vaccine candidates have been licensed to Bristol-Myers from Progenics Pharmaceuticals.

The first of these vaccine candidates, GMK, is in Phase III clinical trials for the treatment of malignant melanoma. In May 2000, Progenics announced that the organization responsible for carrying out one of the Phase III clinical trials for GMK terminated their participation in that trial. Following Progenics' announcement, Bristol-Myers advised us to cease our activities under the agreement until they completed their review of the available data from the clinical trial. We do not expect any future revenues under this agreement unless Bristol-Myers advises us to resume our activities.

Other GlycoTherapeutics Research Programs. We have other GlycoTherapeutics research programs in the following areas:

- Synthetic heparins. We are exploring the use of our technologies to synthesize enzymatically heparins. Heparins are a multi-billion dollar carbohydrate drug category used to treat thrombosis and other cardiovascular indications. Currently, all heparins are produced from pig intestines, and we believe that there may be a future demand for synthetically produced heparins.
- Immune system regulation. In conjunction with scientists at Harvard University, we are investigating whether certain carbohydrates may be useful as regulators of critical immune functions, in particular the switching from Th1 to Th2 immune response, and the reverse. We are exploring whether these carbohydrates may be used for the treatment of various auto-immune conditions, including inflammatory bowel disease, allergic asthma, and psoriasis.

GlycoActives

In our GlycoActives program, we are applying our technology platform to the manufacture and development of carbohydrate-based food ingredients for large nutritional and consumer product markets. Most of the carbohydrate-based food ingredients on the market today are obtained from plants. Ingredients obtained from agricultural sources in different locations will often have inconsistent physical characteristics. We believe our technologies can be used to manufacture products that are cleaner, more consistent, and less expensive than identical products derived from agricultural sources. Our technologies may also enable the commercial production of complex carbohydrates for which no other commercially viable source exists today. Our business strategy is to enter into collaborations with others for the use of our technologies for the development of nutritional and consumer products.

Joint Venture with McNeil Specialty

In late 1999, we entered into a 50/50 joint venture with McNeil Specialty Products Company, a division of Johnson & Johnson, to explore the inexpensive, enzymatic production of fructooligosaccharides (FOS) and other complex carbohydrates. McNeil Specialty's primary impetus for their prior research collaboration with us in 1997 was the need for a healthful, attractively-priced soluble fiber to be used in consumer products with sucralose, McNeil Specialty's approved no-calorie sweetener. At that time, the leading candidate to be developed as a bulking agent for sucralose was FOS, which is useful as a soluble

dietary fiber, and is obtained primarily from agricultural sources. The joint venture constructed its pilot manufacturing facility for the manufacture of FOS. The purpose of the pilot facility was to establish the feasibility of further scale-up of the process to manufacture FOS, as well as to serve as a pilot manufacturing facility for future compounds. Even if it sells all the FOS that can be made at capacity in the initial facility, the joint venture does not expect that it will be profitable. In order to become profitable, the joint venture will require sales from an additional, significantly larger, commercial manufacturing facility.

The joint venture completed construction of the pilot manufacturing facility in July 2000, but it is not yet producing FOS in continuous operations due to numerous difficulties related to the design of the facility. In order to address the design problems of the facility to allow for continuous manufacture of FOS, the joint venture would need to expend additional funds. Joint venture authorization for the expenditure of these funds has not been sought. If such authorization is sought, we cannot predict whether the joint venture will authorize the expenditure of these funds.

In addition to producing compounds for sale to McNeil Specialty as a bulking agent for sucralose, the joint venture anticipates selling FOS to food and nutritional companies as a nutraceutical food ingredient, and possibly developing FOS for use in animal and poultry feeds. These uses could have significant health benefits. Currently, antibiotic supplements are routinely added to poultry and animal feeds. Antibiotic resistance can be transferred to humans who eat animals that have consumed feeds containing antibiotic supplements. If FOS could be developed as a partial or full replacement of antibiotic supplements in poultry and animal feeds, potential antibiotic resistance in humans could be reduced.

The joint venture has also conducted research on other complex carbohydrates that can be produced using our novel technology. McNeil Specialty is expected to select a potential bulking agent for sucralose from a group of second-generation compounds. The joint venture is continuing research on these second-generation compounds to provide the data necessary for McNeil Specialty to make a selection.

Wyeth-Ayerst - Infant Formula Additive

We entered into an agreement in 1999 with Wyeth-Ayerst International, a division of American Home Products Corporation, to develop a manufacturing process for a bioactive carbohydrate to be used as an ingredient in Wyeth-Ayerst's infant and pediatric nutritional formula products. We are responsible for developing a large-scale manufacturing process for this ingredient, and Wyeth-Ayerst plans the introduction of this proprietary ingredient into its infant formula lines. We are receiving contract development payments and will receive payments if we achieve the milestones specified in the agreement. If Wyeth-Ayerst commercializes the ingredient under this agreement, we will sell product to Wyeth-Ayerst at minimum specified transfer prices. Wyeth-Ayerst is a leading global infant formula manufacturer with products distributed in more than 90 countries.

Other Programs

Novazyme Pharmaceuticals, Inc.

We entered into collaboration agreements in 2000 with Novazyme Pharmaceuticals, Inc. Novazyme is developing novel enzyme replacement therapies for several lysosomal storage diseases, including Pompe and MPS-I diseases. There are approximately 50 known lysosomal storage diseases that afflict humans.

These rare diseases are caused by the absence of certain enzymes that lead to the accumulation of material in the lysosomes of the body's cells. This accumulation causes lysosomes to enlarge leading eventually to cell degeneration. This process results in accumulation of material in various tissues and organs of the body causing these organs to function less efficiently, resulting in progressive deterioration in physical and/or mental condition, and eventually death. Under the agreements, we made an investment in Novazyme, and we obtained the right to enter into a 50/50 joint venture for Novazyme's novel enzyme replacement therapy for Pompe disease. In March 2001, we restructured our collaborative agreements with Novazyme to relinquish our right to enter into the joint venture, thereby eliminating the significant financial and clinical risk we would have assumed in the joint venture. Under the amended agreements, we received an additional equity interest in Novazyme, and we will receive cash payments from Novazyme. In addition, if Novazyme commercializes any of its drug candidates for lysosomal storage diseases we will receive royalties based on sales.

Abbott Laboratories

Abbott Laboratories has a non-exclusive license to use our technology to manufacture and commercialize, for nutritional purposes only, any complex carbohydrate naturally found in human breast milk. If Abbott commercializes any products manufactured using our technology, we will receive fees from Abbott tied to commercial quantities.

Patents and Proprietary Rights

We solely own 23 issued U.S. patents, we co-own 2 issued U.S. patents, and have licensed 50 issued U.S. patents from 8 institutions. In addition, we own or have licensed over 48 patent applications pending in the United States. There are a number of U.S. and foreign patent applications related to our owned and licensed patents. 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, Japan Tobacco, Inc., University of Michigan, Marukin Shoyu Co., Ltd., Celltech Therapeutics Limited, University of Arkansas, University of British Columbia, Rockefeller University, University of Alberta, Genencor International, National Research Council Canada, Harvard University, University of Washington, Wayne State University, University of Illinois, and University of Adelaide.

Government Regulation

Products manufactured using our technologies, and our manufacturing and research activities, will typically be subject to significant, but varying, degrees of regulation by a number of government authorities in the United States and other countries. The development, manufacture, marketing, and sale of products manufactured using our technology will be subject to one of the following regulatory review processes before commercialization:

- pharmaceutical - new drug application or biologic license application;
- infant formula additive - new infant formula submission; or
- foods and food ingredients - either self-affirmed to be, or notified as, GRAS (generally recognized as safe) or food additive petition process.

Our products, systems, and processes are subject to continuing review subsequent to marketing, and affirmative reporting requirements to the FDA and other federal, state, or international agencies may be imposed upon us as a condition of continued marketing approval. Generally, pharmaceuticals are

regulated more rigorously than foods and food ingredients. Infant formula additives are special types of food ingredients that are regulated more rigorously than most other types of food ingredients.

Our operations are also subject to regulation under the Occupational Safety and Health Act, the Environmental Protection Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act, and other similar federal, state, and local laws, rules, and regulations governing laboratory activities, waste disposal, handling dangerous materials, and other matters. We voluntarily comply with the National Institutes of Health Guidelines for Research Involving Recombinant DNA Technologies.

Regulation of Pharmaceutical Product Candidates

We intend to manufacture enzymes and sugar nucleotides for use by our potential GlycoAdvance customers, as well as for our own use in manufacturing complex carbohydrates for our GlycoTherapeutics and GlycoActives programs. Our collaborators will be responsible for obtaining all required regulatory approvals for pharmaceutical products incorporating our technologies. The research and development activities regarding, and the future manufacturing and marketing of, all pharmaceutical product candidates incorporating our technologies are and will be subject to significant regulation by numerous governmental authorities in the United States and other countries. Pharmaceutical products intended for therapeutic use in humans are governed principally by the federal Food, Drug and Cosmetic Act, Public Health Service Act, and FDA regulations in the United States, and by comparable laws and regulations in foreign countries. The federal Food, Drug and Cosmetic Act and other federal statutes and regulations govern the testing, manufacture, safety, effectiveness, marketing, labeling, storage, record keeping, approval, advertising, and promotion of pharmaceutical products. The process of completing preclinical and clinical testing and obtaining FDA approval for a new pharmaceutical product requires a number of years and the expenditure of substantial resources.

Following drug discovery, the steps required before a new pharmaceutical product may be marketed in the United States include:

- preclinical laboratory and animal tests;
- the submission to the FDA of an Investigational New Drug application;
- adequate and well-controlled clinical trials, typically conducted in three phases, to establish the safety and effectiveness of the product;
- the submission of a New Drug Application or Biologic License Application to the FDA; and
- FDA approval of the New Drug Application or Biologic License Application prior to any promotion, commercial sale, or shipment of the product.

Preclinical trials, in vitro or in animals, must be conducted to evaluate the safety of a compound for testing in humans. Various regulations govern such testing including Good Laboratory Practices or similar international regulations. Clinical trials, conducted according to Good Clinical Practices or similar international regulations and subject to review by independent oversight bodies (e.g. Institutional Review Boards), are typically conducted in three sequential phases. Phase I clinical trials are primarily designed to determine the metabolic and pharmacologic effects of the product in humans, and the side effects associated with increasing doses. These studies generally involve a small number of healthy volunteer subjects, but may be conducted on people with the disease the product is intended to treat. Phase II studies are conducted to evaluate the effectiveness of the product for a particular indication and thus

involve patients with the disease under study. These studies also provide evidence of the short-term side effects and risks associated with the product. Phase III studies are generally designed to assess the overall benefit-risk relationship of the product. Phase III trials must demonstrate that substantial evidence of safety and effectiveness of a product exists in order to obtain FDA approval for marketing the product. Phase III trials often involve a substantial number of patients in multiple study centers and include longer-term administration of the product than in Phase II trials. A clinical trial may combine the elements of more than one phase, and often at least two Phase III studies demonstrating a product's safety and efficacy are required before marketing approval is received. Typical estimates of the total time required for completing such clinical testing vary between four and ten years. For marketing outside the United States, foreign regulatory requirements govern human clinical trials and marketing approval for products. The requirements relating to the conduct of clinical trials, product licensing, pricing, and reimbursement vary widely from country to country. Regulatory oversight continues after marketing approval for the product is received. Regulatory bodies may require additional clinical trials be performed as a condition of receiving marketing approval. Affirmative reporting obligations are imposed as a condition of continued marketing approval.

Third Party Reimbursement

Our ability and each of our collaborator's ability to commercialize successfully 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. Significant uncertainty exists as to the reimbursement status of new therapeutic products and we cannot be sure that third-party reimbursement would be available for therapeutic products we or our collaborators might develop. Health care reform especially as it relates to prescription drugs is an area of increasing national attention and a priority of many governmental officials. Certain reform proposals, if adopted, could impose limitations on the prices we will be able to charge in the United States for our products or the amount of reimbursement available for our products or the amount of reimbursement available for our products from governmental agencies or third-party payors.

Regulation of Foods and Food Ingredients

We expect that the products of our joint venture with McNeil Specialty will be regulated as food ingredients. Foods and food ingredients are subject to the provisions of the federal Food, Drug and Cosmetic Act. Food ingredients are broadly defined as any substances that may become a component, or otherwise affect the characteristics, of food. Food ingredients are regulated either as GRAS substances or as food additives.

Food ingredients that are GRAS are excluded from the definition of food additives, The FDA has affirmed by regulation a number of substances as GRAS, although it is not required that a substance be affirmed as GRAS by regulation of the FDA in order to be GRAS. Alternatively, under a new proposed regulatory framework, a manufacturer may submit GRAS notification to the FDA claiming that a food ingredient is GRAS. The FDA generally will respond to the notification within approximately ninety days as to whether there is sufficient evidence to support the notifier's conclusion that the substance is GRAS. A positive response from the FDA indicates that it has no objection to the notifier's conclusion that a substance is a GRAS. A manufacturer also may self-affirm a substance as GRAS by making an independent determination that qualified experts would generally agree that the substance is GRAS for a particular use. If the FDA disagrees with the manufacturer's self-determination or GRAS notification, the manufacturer generally must submit a food additive petition to obtain approval to market the food ingredient. If the FDA disagrees with a

determination, the manufacturer must complete the food additive petition process for the substance to be approved by the FDA. Affirmation of GRAS status either by the manufacturer or regulation of the FDA would allow the manufacturer to market and sell the additive or the food containing the additive. Furthermore, a manufacturer's decision to rely on an independent determination may limit the marketability of that manufacturer's products to food manufacturers, many of whom require confirmation of GRAS status from the FDA before they will purchase substances for use in foods from third parties.

Food ingredients that are not GRAS are regulated as food additives. All new food additives require FDA approval prior to commercialization. Information supporting the safety of a food additive is submitted to the FDA in the form of a food additive petition. The food additive petition process is generally expensive and lengthy. Commercialization of the food additive, if permitted by the FDA, often occurs several years after the petition is submitted to the FDA. The petition must establish with reasonable certainty that the food additive is safe for its intended use at the level specified in the petition. The petition is required to contain reports of safety investigations of the food additive and details regarding its physical, chemical, and biological properties. Product safety studies submitted to the FDA are typically conducted in accordance with FDA good laboratory practices requirements. If a food additive petition is submitted, the FDA may choose to reject the petition or deny any desired labeling claims. Furthermore, the FDA may require the establishment of regulations that necessitate costly and time-consuming compliance procedures.

Regulation of Infant Formula Additives

We are collaborating with Wyeth-Ayerst to develop a bioactive carbohydrate as a potential nutritional additive to infant formula. The manufacture, composition, and labeling of infant formulas are subject to the provisions of the United States Infant Formula Act. Prior to commercializing any potential infant formula additive, an infant formula manufacturer must demonstrate that its potential additive:

- is GRAS either by previous regulation of the FDA, or is self-affirmed as GRAS by the infant formula manufacturer; or
- is the subject of an approved food additive petition.

Under the United States Infant Formula Act, infant formula manufacturers are required to notify the FDA of any intent to revise, add, or substitute any protein, fat, or carbohydrate in infant formula ninety days prior to the intended date of commercial distribution. This new infant formula submission must contain the quantitative formulation of the new infant formula, a description of any reformulation or change in processing, and assurances that the new infant formula will not be marketed without complying with the nutrient and quality factor requirements and cGMP control requirements. Upon notification, the FDA has a ninety-day period, in which to request additional information, or deny marketing rights for the new formula. If no response is received from the FDA within the ninety-day period, the manufacturer may proceed with commercial sales of the newly formulated product. Under our agreement, Wyeth-Ayerst is responsible for all regulatory activities relating to the infant formula additive. Wyeth-Ayerst has not yet made, and may never make, any filings with the FDA to propose inclusion of an infant formula additive manufactured using our technology. Their efforts to commercialize any infant formula additive may be materially and adversely affected if they do not self-affirm GRAS status of this potential infant formula additive.

Wyeth-Ayerst may market infant formula containing this additive in foreign countries. Infant formula regulatory requirements vary widely from country to country, and may be more or less stringent than FDA requirements. The time

required to obtain clearances, if required, in foreign countries may be longer or shorter than that required in the United States.

Competition

Some companies are producing by enzymatic and other means a limited variety of complex carbohydrates. Although we do not believe any of these companies has the ability currently to manufacture a wide variety of human carbohydrate products in quantities sufficient for commercialization, any of these companies may develop technologies superior to our technologies. In addition, some companies are investigating novel methods of chemical synthesis, sometimes with enzymatic steps, to produce commercial quantities of complex carbohydrates. These and other efforts by potential competitors may be successful or other methods of carbohydrate synthesis that compete with our technologies, may be developed.

Our GlycoAdvance program competes with several alternative technologies that seek to improve therapeutic glycoproteins as drugs. A number of companies are developing technologies that will compete with GlycoAdvance, to increase the dosing level achievable without side effects and the half-life of these proteins in humans, thus reducing the frequency of required injections. These competitive technologies include microsphere encapsulation, polyethelyne glycol modification, and human albumin fusion.

The products of our joint venture with McNeil Specialty may face significant competition. FOS products that may be produced by the joint venture for nutraceutical applications will face competition from existing FOS products. Principal competitors in this area include a Japanese company, Meiji Seika Kaisha, which sells FOS products under the brand name, Meioligo, a European joint venture, Beghin-Meiji Industries, which sells its FOS products under the brand name Actilight, and a European company, Orafti, which sells its FOS products under the brand names Raftiline, and Raftilose. Another planned joint venture product may be added to McNeil Specialty's sucralose sweetener as a bulking agent. These products will in turn compete with other natural and artificial sweeteners. The joint venture may also sell this bulking agent directly to other users for use in such items as cake mixes, low-fat cookies, or ice cream. There is significant competition from other bulking agents in this market as well, and thus the ability to produce the bulking agent at an attractive price and to offer other product features will be important.

Manufacturing

We intend to manufacture enzymes and sugar nucleotides for use by our potential GlycoAdvance customers, as well as for our own use in manufacturing complex carbohydrates for our current and potential GlycoTherapeutics and GlycoActives customers. We will need to develop commercial-scale manufacturing facilities meeting cGMP, or depend on our collaborators, licensees, or contract manufacturers for the commercial manufacture of our potential products.

We anticipate making capital expenditures during 2001 of at least $10 million to provide additional cGMP manufacturing capacity in our Horsham, Pennsylvania facility to support the initial requirements of our anticipated GlycoAdvance customers. Even if we make these capital expenditures, we may not be able to enter into collaborations with potential GlycoAdvance customers. In addition, we anticipate in the next 12 to 24 months we will obtain, either through lease or purchase, another facility of at least 70,000 square feet. We plan to relocate all non-cGMP research laboratories and corporate office space from our current facility in Horsham, Pennsylvania into the new facility, leaving our current facility available for future expansion of our cGMP manufacturing capacity.

We believe we have the capacity to develop scalable manufacturing processes required for our collaboration with Wyeth-Ayerst in our existing facilities, although we currently estimate that we will require additional facilities to produce these ingredients at commercial scale.

Our joint venture with McNeil Specialty completed construction of its pilot manufacturing facility in July 2000, but it is not yet producing FOS, the intended product, in continuous operations due to numerous difficulties related to the design of the facility. In order to address the remaining design problems of the facility to allow for continuous manufacture of FOS, the joint venture would need to expend additional funds. Joint venture authorization for the expenditure of these funds has not been sought. If such authorization is sought, we cannot predict whether the joint venture will authorize the expenditure of these funds. We believe we have the capacity, in our current facility in Horsham, Pennsylvania, to manufacture under cGMP conditions the quantities of enzyme required to supply the joint venture's pilot manufacturing facility.

Marketing, Distribution, and Sales

We intend to rely substantially on collaborative partners to commercialize our broad technology platform. Although we have three employees focused on business development, we have limited experience and capability in marketing our technologies to potential collaborators. We have no experience or capability in marketing, distributing, or selling products. If we commercialize any products, we will have to develop a sales force or rely on our collaborators, licensees, or arrangements with others to provide marketing, distribution, and sales support for these products. The marketing, advertising, and promotion of any product would likely be subject to regulation by the FDA or other governmental agency.

Employees

As of December 31, 2000, we employed 87 individuals, consisting of 64 employees engaged in research and development activities and 23 employees devoted to business development, finance, and administrative activities. Our 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 in the food industry, 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.

Executive Officers of the Company

The name, age as of March 25, 2001, and position of each of our executive officers are as follows:

Stephen A. Roth, Ph.D, 58, has served on our Board since 1989 and as Chairman and Chief Executive Officer since August 1994. Dr. Roth co-founded Neose, and 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.

P. Sherrill Neff, 49, has served on our Board since December 1994, as

President and Chief Financial Officer since December 1994, and as Chief Operating Officer since April 2000. From 1993 to December 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 specialty financial services company. Mr. Neff is also on the board of directors of the Pennsylvania Biotechnology Association, the University City Science Center, 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.

Edward J. McGuire, Ph.D., 63, has served as our Vice President, Research and Development since 1990. Dr. McGuire was on the faculty of the University of Pennsylvania from 1985 to 1990. From 1984 to 1985, Dr. McGuire served as a Senior Researcher at Genetic Engineering, Inc., a biotechnology company. Dr. McGuire received his B.A. in biology from Blackburn College, and his Ph.D. in biochemistry/chemistry from the University of Illinois Medical School.

Eric L. Sichel, M.D., 42, has served as our Vice President, Business Strategy and Corporate Communications since November 2000. From December 1996 to November 2000, Dr. Sichel provided biotechnology investment advisory services to institutional investment funds, including Emerald Asset Management and Omega Advisors. From 1995 to December 1996, Dr. Sichel served as Senior Biotechnology Analyst at Alex. Brown and Sons. From 1989 to 1995, Dr. Sichel held a number of positions at Sandoz Pharmaceutals, serving most recently as Associate Director, New Product Management. Dr. Sichel received his M.D. from UMDNJ-New Jersey Medical School, and his M.B.A. from Columbia Business School.

David A. Zopf, M.D., 58, has served as our Vice President, Drug Development since 1992. 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.

ITEM 2. PROPERTIES.

We own, subject to a mortgage, approximately 45,000 square feet of cGMP manufacturing, laboratory, and corporate office space in Horsham, Pennsylvania. Our lease of approximately 2,600 square feet of laboratory and office space in San Diego, California expires in September 2001 and will not be renewed due to our relocation, which is expected in June 2001, into approximately 10,000 square feet of leased laboratory and office space in San Diego, California. Our new lease expires in March 2006. We anticipate our expanded operations in San Diego will allow us to increase our research and development efforts for our GlycoAdvance program.

We anticipate making capital expenditures during 2001 of at least $10 million to provide additional cGMP manufacturing capacity in our Horsham, Pennsylvania facility to support the initial requirements of our anticipated GlycoAdvance customers. Even if we make these capital expenditures, we may not be able to enter into collaborations with potential GlycoAdvance customers. In addition, we anticipate we will obtain in the next 12 to 24 months, either through lease or purchase, another facility of at least 70,000 square feet. We plan to relocate all non-cGMP research laboratories and corporate office space

from our current facility in Horsham, Pennsylvania into the new facility, leaving our current facility available for future expansion of our cGMP manufacturing capacity.

We intend to manufacture enzymes and sugar nucleotides for use by our potential GlycoAdvance customers, as well as for our own use in manufacturing complex carbohydrates for our current and potential GlycoTherapeutics and GlycoActives customers. We will need to develop commercial-scale manufacturing facilities meeting cGMP, or depend on our collaborators, licensees, or contract manufacturers for the commercial manufacture of our potential products. See "Item 1-Business-Manufacturing."

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 2000.

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, 1999		
First Quarter	$17.25	$10.75
Second Quarter	14.38	8.75
Third Quarter	15.00	8.56
Fourth Quarter	17.63	9.94
Year Ended December 31, 2000		
First Quarter	60.13	13.00
Second Quarter	45.94	18.63
Third Quarter	51.82	33.00
Fourth Quarter	52.00	25.75
Year Ended December 31, 2001		
First Quarter (through March 26, 2001)	44.38	24.88

As of March 26, 2001, there were approximately 200 record holders and 4,000 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.

ITEM 6. SELECTED FINANCIAL DATA.

The following Statements of Operations Data for the years ended December 31, 1996, 1997, 1998, 1999, and 2000, and for the period from inception (January 17, 1989) through December 31, 2000, are derived from our consolidated financial statements that have been audited by Arthur Andersen LLP, independent public accountants. 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,				
	1996	1997	1998	1999	2000
	(in thousands, except per share data)				
Statements of Operations Data:					
Revenue from collaborative agreements	$ 1,383	$ 725	$ 390	$ 422	$ 4,600
Operating expenses:					
Research and development	6,502	8,013	9,912	10,649	12,094
General and administrative	2,505	3,884	3,635	4,520	5,648
Total expenses	9,007	11,897	13,547	15,169	17,742
Interest income, net	1,483	2,108	1,250	1,429	4,642
Net loss	$(6,141)	$ (9,064)	$(11,907)	$(13,318)	$(8,500)
Basic and diluted net loss per share	$ (0.82)	$ (0.96)	$ (1.25)	$ (1.25)	$ (0.63)
Basic and diluted weighted-average shares outstanding	7,494	9,405	9,556	10,678	13,428

	As of December 31,				
	1996	1997	1998	1999	2000
	(in thousands)				
Balance Sheet Data:					
Cash and marketable securities	$ 32,845	$ 43,303	$ 32,023	$ 33,235	$ 94,762
Total assets	37,118	58,886	46,265	52,239	114,768
Long-term debt	556	8,917	8,300	7,300	6,200
Deficit accumulated during the development stage	(25,523)	(34,587)	(46,494)	(59,812)	(68,312)
Total stockholders' equity	35,120	46,954	36,013	40,785	104,868

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

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

Overview

Neose develops proprietary technologies for the synthesis and manufacture of complex carbohydrates, which are chains of simple sugar molecules that can be joined together in many different combinations. Our enzymatic glycosylation technology platform makes feasible the synthesis of a wide range of complex carbohydrates for pharmaceutical, biotechnology, nutritional, and consumer product applications. Our GlycoAdvance program uses our technologies to enable the completion and correction of glycosylation in recombinant glycoprotein discovery, development, and manufacture. Our GlycoTherapeutics program uses our technologies to develop and produce novel carbohydrate-based therapeutics, and our GlycoActives program uses our technologies to develop and produce novel carbohydrate-based food ingredients. We have incurred operating losses each year. As of December 31, 2000, we had an accumulated deficit of approximately $68 million. We expect additional losses for some time as we expand research and development efforts, expand manufacturing scale-up activities, and begin sales and marketing activities.

Results of Operations

Years Ended December 31, 2000 and 1999

Revenues from collaborative agreements increased to approximately $4.6 million in 2000 from approximately $0.4 million in 1999. Payments under our agreement with Bristol-Myers accounted for approximately $3.3 million of our collaborative revenues in 2000. We do not expect any future payments under this agreement unless Bristol-Myers advises us to resume our activities.

Research and development expenses increased to $12.1 million in 2000 from $10.6 million in 1999. The increase was primarily attributable to additional services rendered under our current research and development agreement with Bristol-Myers, and non-cash compensation expense associated with stock options granted to non-employees. During the year ended December 31, 2000, our joint venture with McNeil Specialty reimbursed Neose approximately $1.6 million for the cost of research and development services and supplies provided to the joint venture. This amount has been reflected as a reduction of research and development expense in our Consolidated Statements of Operations.

General and administrative expenses increased to $5.6 million in 2000 from $4.5 million in 1999. The increase was primarily attributable to the hiring of additional business development and administrative personnel, and the non-cash compensation expense associated with stock options granted to non-employees.

Interest income increased to $5.1 million in 2000 from $1.9 million in 1999 due to higher average cash and marketable securities balances during 2000 resulting from our public offering of 2.3 million shares of common stock in March 2000. Interest expense increased to $469,000 in 2000 from $433,000 in 1999 due to higher average interest rates, and was partly offset by lower average loan balances outstanding during 2000.

Years Ended December 31, 1999 and 1998

Revenues from collaborative agreements increased to $422,000 in 1999 from $390,000 in 1998. Substantially all of our revenues during 1999 were payments received by us under our collaborative agreements with Bristol-Myers and

Wyeth-Ayerst. Substantially all of our revenues during 1998 were payments received by us under our collaborative agreement with Bristol-Myers.

Research and development expenses increased to $10.6 million in 1999 from $9.9 million in 1998. The increase was primarily attributable to increased funding of outside research, and the amortization of acquired technology from Cytel Corporation.

General and administrative expenses increased to $4.5 million in 1999 from $3.6 million in 1998. The increase was primarily attributable to increased patent and general legal expenses associated with the intellectual property acquired from Cytel Corporation, and increased business development expense.

Interest income increased to $1.9 million in 1999 from $1.8 million in 1998 due to higher average cash and marketable securities balances during 1999. Interest expense decreased to $433,000 in 1999 from $534,000 in 1998 due to lower average loan balances outstanding during 1999.

Liquidity and Capital Resources

We have incurred operating losses each year since our inception. As of December 31, 2000, we had an accumulated deficit of approximately $68 million. We have financed our operations through private and public offerings of our securities, and revenues from our collaborative agreements. We had $94.8 million in cash and marketable securities as of December 31, 2000, compared to $33.2 million in cash and marketable securities as of December 31, 1999. The increase was primarily attributable to the proceeds from our public offering of 2.3 million shares of common stock in March 2000.

During 1998, 1999, and 2000, we purchased approximately $0.8 million, $1.2 million, and $1.7 million of property, equipment, and building improvements. We anticipate making capital expenditures during 2001 of at least $10 million to provide additional cGMP manufacturing capacity in our Horsham, Pennsylvania facility to support the initial requirements of our anticipated GlycoAdvance customers. Even if we make these capital expenditures, we may not be able to enter into collaborations with potential GlycoAdvance customers. In addition, we anticipate in the next 12 to 24 months we will obtain, either through lease or purchase, another facility of at least 70,000 square feet. We plan to relocate all non-cGMP research laboratories and corporate office space from our current facility in Horsham, Pennsylvania into the new facility, leaving our current facility available for future expansion of our cGMP manufacturing capacity.

We may be required to make additional investments in our joint venture with McNeil Specialty to fund capital expenditures. If the joint venture builds additional production facilities, and we wish to maintain our 50% ownership interest in the joint venture, we are required to invest up to $8.85 million to fund half of such expenditures. However, we may elect to fund as little as $1.85 million of the cost of the facilities, so long as our aggregate investments in the joint venture are at least 15% of the joint venture's aggregate capital expenditures. In this case, McNeil Specialty will fund the remainder of our half of the joint venture's capital expenditures, and our ownership percentage will be proportionately reduced. We have an option, expiring in September 2006, to return to 50% ownership of the joint venture by reimbursing McNeil Specialty for this amount.

In 1997, we issued, through the Montgomery County (Pennsylvania) Industrial Development Authority, $9.4 million of taxable and tax-exempt bonds. The bonds were issued to finance the purchase of our previously leased 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 2000, the weighted-average, effective interest rate was 7.5% 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, 2000, we had restricted funds relating to the bonds of $893,000, which consisted of our monthly payments to an escrow account plus interest revenue on the balance of 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 a covenant, which was renegotiated in May 2000, to maintain a minimum required cash and short-term investments balance of at least two times the current loan balance. At December 31, 2000, we were required to maintain a cash and short-term investments balance of $14.6 million, rather than $20 million as required under the original covenant. 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, which was $7.3 million as of December 31, 2000.

We expect that our existing cash and short-term investments will be adequate to fund our operations through at least 2002, although changes in our collaborative relationships or our business, whether or not initiated by us, may cause us to deplete our cash and short-term investments 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 or when any products manufactured using our technology are commercialized.

Joint Venture with McNeil Specialty

Our joint venture with McNeil Specialty is owned equally by Neose and McNeil Specialty. Each of Neose and McNeil Specialty contributed various intellectual property to the joint venture. In addition, McNeil Specialty contributed to the joint venture the pilot manufacturing facility, for which 50% of the cost will be reimbursed by the joint venture. 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 $350,000 to zero to reflect our share of the joint venture's losses. We recorded this amount as research and development expense in our Consolidated 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.

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, 2000, the joint venture had an accumulated loss since inception of approximately $3.5 million, of which our 50% share is approximately $1.75 million. Until the joint venture is profitable, McNeil Specialty is required to fund, as a non-recourse, no-interest loan, 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 Specialty 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 Specialty before any distribution of assets to us. As of December 31, 2000, the joint venture owed McNeil Specialty approximately $5.0 million.

Recent Accounting Pronouncement

In December 1999, the Securities and Exchange Commission staff issued Staff Accounting Bulletin No. 101, "Revenue Recognition in Financial Statements" (SAB 101). The bulletin draws on existing accounting rules and provides specific guidance on how those accounting rules should be applied, and specifically addresses revenue recognition for non-refundable technology access fees in the biotechnology industry. We adopted SAB 101 in the fourth quarter of 2000, effective for all of 2000. SAB 101 had no impact on our financial position or results of operations as our revenue recognition policy was consistent with SAB 101.

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

We do not hold any investments in market risk sensitive instruments. Accordingly, we believe that we are not subject to any material risks arising from changes in interest rates, foreign currency exchange rates, commodity prices, equity prices or other market changes that affect market risk sensitive instruments.

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)

2000 Quarter Ended	Dec. 31	Sept. 30	June 30	
Revenue from collaborative agreements	$ 301	$ 583	$ 1,769	$
Net loss	(2,136)	(2,478)	(2,060)	
Basic and diluted net loss per share	(0.15)	(0.18)	(0.15)	

1999 Quarter Ended	Dec. 31	Sept. 30	June 30	M
Revenue from collaborative agreements	$ 205	$ 92	$ -	$
Net loss	(3,445)	(3,009)	(3,792)	
Basic and diluted net loss per share	(0.30)	(0.26)	(0.38)	

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

None.

PART III

ITEM 10. DIRECTORS AND EXECUTIVE OFFICERS OF THE REGISTRANT.

Information concerning our directors is incorporated herein by reference to our definitive proxy statement to be filed in connection with solicitation of proxies for our Annual Meeting of Stockholders to be held on June 20, 2001. For information concerning our executive officers, see "Item 1. Business - Executive Officers of the Company."

ITEM 11. EXECUTIVE COMPENSATION.

The information required by this item is incorporated herein by reference to our definitive proxy statement to be filed in connection with solicitation of proxies for our Annual Meeting of Stockholders to be held on June 20, 2001.

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

The information required by this item is incorporated herein by reference to our definitive proxy statement to be filed in connection with solicitation of proxies for our Annual Meeting of Stockholders to be held on June 20, 2001.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS.

The information required by this item is incorporated herein by reference to our definitive proxy statement to be filed in connection with solicitation of proxies for our Annual Meeting of Stockholders to be held on June 20, 2001.

PART IV

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

(a) 1. Financial Statements.

The Consolidated Financial Statements filed as part of this Annual Report on Form 10-K are listed on the Index to Consolidated 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 Consolidated Financial Statements or Notes thereto.

3. Exhibits. (See (c) below)

(b) Reports on Form 8-K.

None.

(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	Amended and Restated By-Laws. (Exhibit 3.3)(5)
3.3	Certificate of Designation establishing and designating the Series A Junior Participa (Exhibit 3.2)(5)
4.1	See Exhibits 3.1, 3.2, and 3.3 for instruments defining rights of holders of common s
4.2	Representation pursuant to Item 601(b)(4)(iii)(A) of Regulation S-K. (Exhibit 4.1)(3)
4.3	Trust Indenture, dated as of March 1, 1997, between Montgomery County Industrial Deve Dauphin Deposit Bank and Trust Company. (Exhibit 4.2)(3)
4.4	Form of Montgomery County Industrial Development Authority Federally Taxable Variable Bond (Neose Technologies, Inc. Project) Series B of 1997. (Exhibit 4.3)(3)
4.5	Amended and Restated Rights Agreement, dated as of December 3, 1998, between American Company, as Rights Agent, and Neose. (Exhibit 4.1)(6)
4.6	Amendment No. 1 dated November 14, 2000 to the Amended and Restated Rights Agreement 1998, between Neose Technologies, Inc. and American Stock Transfer & Trust Company, a (Exhibit 4.1)(10)
10.1	Stock Purchase Agreement, dated as of August 28, 1990, between University of Pennsylv (Exhibit 10.1)(1)
10.2	License Agreement, dated as of August 28, 1990, between University of Pennsylvania an date. (Exhibit 10.2)(1)

10.3(a)+	Series D Preferred Stock Purchase Agreement, dated as of December 30, 1992, between A Neose. (Exhibit 10.8(a))(1)
10.3(b)+	Supply Agreement, dated as of December 30, 1992, between Abbott Laboratories and Neos
10.3(c)+	Research and License Agreement, dated as of December 30, 1992, between Abbott Laborat (Exhibit 10.8(c))(1)
10.3(d)+	Amendment to the Research and License Agreement, dated as of January 18, 1995, betwee and Neose. (Exhibit 10.8(d))(2)
10.4	Form of Series E Preferred Stock Investors' Rights Agreement. (Exhibit 10.9)(1)
10.5	Form of Series F Preferred Stock Investors' Rights Agreement. (Exhibit 10.10)(1)
10.6	Form of Warrant to Purchase Common Stock, dated as of February 23, 1991. (Exhibit 10.
10.7	Form of Warrant to Purchase Common Stock, dated as of June 30, 1993. (Exhibit 10.12)(
10.8	Form of Warrant to Purchase Common Stock, dated as of February 16, 1994. (Exhibit 10.
10.9	Form of Warrant to Purchase Series E Preferred Stock, dated as of July 29, 1994. (Exh
10.10	Warrant for the Purchase of Common Stock, dated as of June 30, 1995, between Financin International, Inc. and Neose. (Exhibit 10.15)(1)
10.11++	1995 Stock Option/Stock Issuance Plan, as amended. (Exhibit 99.1)(4)
10.12++	Employee Stock Purchase Plan. (Exhibit 10.17)(1)
10.13++	Employment Agreement dated April 1, 1992, between David A. Zopf and Neose, as amended 10.18)(1)
10.14++	Employment Agreement dated December 1, 1994, between P. Sherrill Neff and Neose. (Exh
10.15	Agreement for Purchase and Sale of Real Property, dated March 14, 1997, by and betwee Campus Delaware, Inc. and Neose. (Exhibit 2.1)(3)
10.16	Loan Agreement, dated as of March 1, 1997, between Montgomery County Industrial Devel Neose. (Exhibit 10.1)(3)
10.17	Participation and Reimbursement Agreement, dated as of March 1, 1997, between Jeffers Bank, N.A. (Exhibit 10.2)(3)
10.18	Form of CoreStates Bank, N.A. Irrevocable Letter of Credit. (Exhibit 10.3)(3)
10.19	Pledge, Security and Indemnification Agreement, dated as of March 1, 1997, by and amo N.A., Jefferson Bank, and Neose. (Exhibit 10.4)(3)
10.20	Reimbursement Agreement, dated as of March 1, 1997, between Jefferson Bank and Neose.

10.21	Specimen of Note from Company to Jefferson Bank. (Exhibit 10.6)(3)
10.22	Mortgage, Assignment and Security Agreement, dated March 20, 1997, between Jefferson (Exhibit 10.7)(3)
10.23	Security Agreement, dated as of March 1, 1997, by and between Jefferson Bank and Neos
10.24	Assignment of Contract, dated as of March 20, 1997, between Jefferson Bank and Neose.
10.25	Custodial and Collateral Security Agreement, dated as of March 20, 1997, by and among Bank, and Neose. (Exhibit 10.10)(3)
10.26	Placement Agreement, dated March 20, 1997, among Montgomery County Industrial Develop CoreStates Capital Markets, and Neose. (Exhibit 10.11)(3)
10.27	Remarketing Agreement, dated as of March 1, 1997, between CoreStates Capital Markets 10.12)(3)
10.28	Form of Purchase Agreement dated as of June 25, 1999, between Neose Technologies, Inc set forth on the signature pages thereto. (Exhibit 99.1)(7)
10.29	Form of Amended and Restated Purchase Agreement dated as of June 25, 1999, between Ne and the purchasers set forth on the signature pages thereto. (Exhibit 99.2)(7)
10.30	Research and Development Agreement, dated June 1, 1998, between Neose Technologies, I Pharmaceutical Research Institute of Bristol-Myers Squibb Company. (Exhibit 99.1)(8)

10.31	Operating Agreement of Magnolia Nutritionals LLC, dated October 12, 1999, between Neo and McNeil PPC, Inc. acting through its division McNeil Specialty Products Company. (
10.32	Collaboration and License Agreement, dated November 3, 1999, between Neose Technologi Home Products Corporation. (Exhibit 99.3)(8)
10.33	Modification Agreement Relating To Reimbursement Agreements, dated as of May 1, 2000, Bank, Jefferson Bank Division, successor to Jefferson Bank, and Neose. (Exhibit 10.1)
10.34	Modification Agreement Relating to Custodial Bank Agreement dated as of May 1, 2000, Hudson United Bank, Jefferson Bank Division, successor to Jefferson Bank, and Neose.
10.35*++	Employment Offer Letter dated November 27, 2000, between Eric Sichel and Neose.
11*	Statement re: Computation of Net Loss Per Common Share.
23.1*	Consent of Arthur Andersen LLP.
24*	Powers of Attorney (included as part of signature page hereof).

---

* 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.

(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 Registration Statement on Form S-1 (Registration No. 333-19629) filed with the SEC on January 13, 1997.

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

(4) Filed as an Exhibit to our Registration Statement on Form S-8 (Registration No. 333-47718) filed with the SEC on October 11, 2000.

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

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

(7) Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on July 14, 1999.

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

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

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

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 30, 2001

By: /s/ Stephen A. Roth
Stephen A. Roth
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 Stephen A. Roth, Chief Executive Officer of Neose, and P. Sherrill Neff, President and Chief Financial Officer of Neose, and each of them acting alone, as his 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	D
/s/ Stephen A. Roth Stephen A. Roth	Chief Executive Officer and Chairman of the Board (Principal Executive Officer)	M
/s/ P. Sherrill Neff P. Sherrill Neff	President and Chief Financial Officer and Director (Principal Financial and Accounting Officer)	M
/s/ William F. Hamilton William F. Hamilton	Director	M
/s/ Douglas J. MacMaster, Jr. Douglas J. MacMaster, Jr.	Director	M
/s/ Mark H. Rachesky Mark H. Rachesky	Director	M
/s/ Lindsay A. Rosenwald Lindsay A. Rosenwald	Director	M
/s/ Lowell E. Sears Lowell E. Sears	Director	M

/s/ Jerry A. Weisbach Director M

Jerry A. Weisbach

Index to Consolidated Financial Statements

Report of Independent Public Accountants F-2

Consolidated Balance Sheets F-3

Consolidated Statements of Operations F-4

Consolidated Statements of Stockholders' Equity and Comprehensive Loss F-5

Consolidated Statements of Cash Flows F-8

Notes to Consolidated Financial Statements F-9

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, 1999 and 2000, 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, 2000, and for the period from inception (January 17, 1989) to December 31, 2000. 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, 1999 and 2000, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2000, and for the period from inception (January 17, 1989) to December 31, 2000, in conformity with accounting principles generally accepted in the United States.

Arthur Andersen LLP

Philadelphia, Pennsylvania
January 23, 2001

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

Consolidated Balance Sheets
(in thousands, except per share amounts)

Assets	Decembe 1999
Current assets:	
Cash and cash equivalents	$ 10,365
Marketable securities	22,870
Restricted funds	2,285
Prepaid expenses and other current assets	118
Total current assets	35,638
Property and equipment, net	13,366
Other assets, net	3,235
Total assets	$ 52,239
Liabilities and Stockholders' Equity	
Current liabilities:	
Current portion of long-term debt	$ 1,000
Accounts payable	237
Accrued compensation	455
Accrued expenses	1,657
Deferred revenue	805
Total current liabilities	4,154
Long-term debt	7,300
Total liabilities	11,454
Commitments (Note 11)	
Stockholders' equity:	
Preferred stock, $.01 par value, 5,000 shares authorized, none issued	--

Common stock, $.01 par value, 30,000 shares authorized; 11,434 and 13,992 shares issued and outstanding	114
Additional paid-in capital	101,013
Deferred compensation	(530)
Deficit accumulated during the development stage	(59,812)
Total stockholders' equity	40,785
Total liabilities and stockholders' equity	$ 52,239

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

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

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

	Year Ended December 31,			Period fro inception (January 1 1989) to December 3
	1998	1999	2000	2000
Revenue from collaborative agreements	$ 390	$ 422	$ 4,600	$ 11,
Operating expenses:				
Research and development	9,912	10,649	12,094	63,
General and administrative	3,635	4,520	5,648	26,
Total operating expenses	13,547	15,169	17,742	90,
Operating loss	(13,157)	(14,747)	(13,142)	(79,
Interest income	1,784	1,862	5,111	13,
Interest expense	(534)	(433)	(469)	(3,
Net loss	$ (11,907)	$ (13,318)	$ (8,500)	$ (68,
Basic and diluted net loss per share	$ (1.25)	$ (1.25)	$ (0.63)	
Basic and diluted weighted-average shares outstanding	9,556	10,678	13,428	

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

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

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

	Convertible Preferred Stock		Common Stock		Additional paid-in capital	Deferred compensation	D acc du dev
	Shares	Amount	Shares	Amount			
Balance, January 17, 1989 (inception)	--	$ --	--	$ --	$ --	$ --	
Initial issuance of common stock	--	--	1,302	13	(3)	--	
Shares issued pursuant to consulting, licensing, and antidilutive agreements	--	--	329	3	(1)	--	
Sale of common stock	--	--	133	1	1	--	
Net loss	--	--	--	--	--	--	
Balance, December 31, 1990	--	--	1,764	17	(3)	--	
Sale of stock	1,517	15	420	4	4,499	(7)	
Shares issued pursuant to consulting and antidilutive agreements	--	--	145	1	--	--	
Capital contributions	--	--	--	--	10	--	
Dividends on preferred stock	--	--	--	--	(18)	--	
Net loss	--	--	--	--	--	--	
Balance, December 31, 1991	1,517	15	2,329	22	4,488	(7)	
Sale of stock	260	2	17	--	2,344	--	
Shares issued pursuant to redemption of notes payable	--	--	107	1	682	--	
Exercise of stock options and warrants	--	--	21	--	51	--	
Amortization of deferred compensation	--	--	--	--	--	5	
Dividends on preferred stock	--	--	--	--	(36)	--	
Net loss	--	--	--	--	--	--	
Balance, December 31, 1992	1,777	17	2,474	23	7,529	(2)	

Sale of preferred stock	250	3	--	--	1,997	--	
Shares issued to licensor	--	--	3	--	--	--	
Shares issued to preferred stockholder in lieu of cash dividends	--	--	1	--	18	--	
Amortization of deferred compensation	--	--	--	--	--	2	
Dividends on preferred stock	--	--	--	--	(36)	--	
Net loss	--	--	--	--	--	--	
Balance, December 31, 1993	2,027	20	2,478	23	9,508	--	
Sale of preferred stock	2,449	25	--	--	11,040	--	
Exercise of stock options	--	--	35	1	14	--	
Shares issued to preferred stockholder in lieu of cash dividends	--	--	10	1	53	--	
Dividends on preferred stock	--	--	--	--	(18)	--	
Net loss	--	--	--	--	--	--	
Balance, December 31, 1994	4,476	$45	2,523	$25	$20,597	$ --	$

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

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

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

	Convertible Preferred Stock		Common Stock		Additional paid-in	Deferred	Defi accumu durin develo
	Shares	Amount	Shares	Amount	capital	compensation	sta
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	(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	(360)	
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	--	
Deferred compensation related to acceleration of option vesting	--	--	--	--	106	--	
Amortization of deferred compensation	--	--	--	--	--	90	
Net loss	--	--	--	--	--	--	
Balance, December 31, 1996	--	--	8,215	82	60,831	(270)	
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	(322)	
Amortization of deferred compensation	--	--	--	--	--	231	
Net loss	--	--	--	--	--	--	
Balance, December 31, 1997	--	$ --	9,525	$ 95	$81,807	$ (361)	$

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

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

	Convertible Preferred Stock		Common Stock		Additional paid-in capital	Deferred compensation	Defi accumu durin develo sta
	Shares	Amount	Shares	Amount			

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)
Sales 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 stock options	--	--	--	--	1,270	(1,270)
Amortization of deferred compensation	--	--	--	--	--	1,083
Net loss	--	--	--	--	--	--
Balance, December 31, 2000	--	$ --	13,992	$ 140	$ 173,757	$ (717) $

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

Consolidated Statements of Cash Flows
(in thousands)

	Year ended December 31		
	1998	1999	
Cash flows from operating activities:			
Net loss	$ (11,907)	$ (13,318)	$
Adjustments to reconcile net loss to cash used in operating activities:			
Depreciation and amortization	1,838	1,695	
Non-cash compensation	311	477	
Common stock issued for non-cash and other charges	-	-	
Changes in operating assets and liabilities:			
Prepaid expenses and other current assets	282	117	
Accounts payable	(302)	192	
Accrued compensation	(11)	125	
Accrued expenses	(327)	697	
Deferred revenue	-	805	
Net cash used in operating activities	(10,116)	(9,210)	
Cash flows from investing activities:			
Purchases of property and equipment	(761)	(1,207)	
Proceeds from sale-leaseback of equipment	-	-	
Purchases of marketable securities	(24,315)	(88,662)	
Proceeds from sales of marketable securities	1,982	8,882	
Proceeds from maturities of and other changes in marketable securities	26,221	79,227	
Purchase of acquired technology	-	(3,550)	
Purchase of preferred stock	-	-	
Restricted cash related to acquired technology	-	(1,500)	
Net cash provided by (used in) investing activities	3,127	(6,810)	
Cash flows from financing activities:			
Proceeds from issuance of debt	-	-	
Repayment of debt	(1,040)	(617)	
Restricted cash related to debt	(18)	(317)	
Proceeds from issuance of preferred stock, net	-	-	
Proceeds from issuance of common stock, net	171	17,572	
Proceeds from public offerings, net	-	-	
Proceeds from exercise of stock options and warrants	262	263	
Dividends paid	-	-	
Net cash provided by (used in) financing activities	(625)	16,901	
Net increase (decrease) in cash and cash equivalents	(7,614)	881	
Cash and cash equivalents, beginning of period	17,098	9,484	
Cash and cash equivalents, end of period	$ 9,484	$ 10,365	$
Supplemental disclosure of cash flow information:			
Cash paid for interest	$ 548	$ 429	$

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 consolidated financial statements

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

Notes to Consolidated Financial Statements

Note 1. Background

Neose develops proprietary technologies for the synthesis and manufacture of complex carbohydrates, which are chains of simple sugar molecules that can be joined together in many different combinations. Our enzymatic glycosylation technology platform makes feasible the synthesis of a wide range of complex carbohydrates for pharmaceutical, biotechnology, nutritional, and consumer product applications. Our GlycoAdvance program uses our technologies to enable the completion and correction of glycosylation in recombinant glycoprotein discovery, development, and manufacture. Our GlycoTherapeutics program uses our technologies to develop and produce novel carbohydrate-based therapeutics, and our GlycoActives program uses our technologies to develop and produce novel carbohydrate-based food ingredients.

Note 2. Summary of Significant Accounting Policies

Principles of Consolidation

The consolidated financial statements include the accounts of Neose Technologies, Inc. and its wholly-owned subsidiaries, and reflect the elimination of all significant intercompany accounts and transactions.

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 that affect the amounts reported in the financial statements. 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.

Marketable Securities

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. Our other marketable securities are classified as

available-for-sale securities and are carried at fair value, based on quoted market prices, with unrealized gains and losses reported as a separate component of stockholders' equity. All realized gains and losses on our available-for-sale securities, computed using specific identification, and any declines in value determined to be permanent are recognized in the Consolidated Statements of Operations. As of December 31, 2000, all marketable securities were classified as "held-to-maturity" securities.

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

Comprehensive Loss

Our comprehensive loss for the years ended December 31, 1999 and 2000 was approximately $13.5 million and $8.5 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.

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 use depreciable lives of three to seven years for computer, office, research, and manufacturing equipment, and seventeen to twenty years for building and improvements.

Impairment of Long-Lived Assets

As required by Statement of Financial Accounting Standards No. 121, "Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed of," we assess the recoverability of any 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 operating and 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, 2000.

Research and Development

Research and development costs are charged to expense as incurred.

Income Taxes

We account for income taxes in accordance with Statement of Financial Accounting Standards No. 109, "Accounting for Income Taxes." The objective of

this pronouncement is to recognize and measure, using enacted tax laws, the amount of current and deferred income taxes payable or refundable at the date of the financial statements as a result of all events that have been recognized in the financial statements.

Revenue Recognition

In December 1999, the Securities and Exchange Commission staff issued Staff Accounting Bulletin No. 101, "Revenue Recognition in Financial Statements" (SAB 101). The bulletin draws on existing accounting rules and provides specific guidance on how those accounting rules should be applied, and specifically addresses revenue recognition for non-refundable technology access fees in the biotechnology industry. We adopted SAB 101 in the fourth quarter of 2000, effective for all of 2000. SAB 101 had no impact on our financial position or results of operations as our revenue recognition policy was consistent with SAB 101.

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, 1998, 1999, and 2000, the effects of the exercise of outstanding stock options and warrants were antidilutive; accordingly, they were excluded from the calculation of diluted earnings per share.

Fair Value of Financial Instruments

As of December 31, 2000, the carrying values of cash, cash equivalents, marketable securities, accounts payable, accrued expenses, and accrued compensation approximate their respective fair values. In addition, the carrying value of our debt instrument, which does not have a readily ascertainable market value, approximates its fair value.

Reclassification

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

Note 3. Collaborative Agreements

Agreement with McNeil Specialty

During 1999, we entered into a joint venture with McNeil Specialty Products Company, a division of Johnson & Johnson, to explore the inexpensive, enzymatic production of fructooligosaccharides and other complex carbohydrates. Neose and McNeil Specialty own the joint venture equally. Each of Neose and McNeil Specialty contributed various intellectual property to the joint venture. In addition, McNeil Specialty contributed to the joint venture the pilot manufacturing facility, for which 50% of the cost will be reimbursed by the joint venture. McNeil Specialty has the exclusive right to purchase the joint

venture's bulking agent for use in specified consumer product applications at a constant mark-up over the joint venture's cost of production.

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 $350,000 to zero to reflect our share of the joint venture's losses. We recorded this amount as research and development expense in our Consolidated 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.

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 loss. As of December 31, 2000, the joint venture had accumulated losses since inception of approximately $3.5 million, of which our 50% share is approximately $1.75 million.

Until the joint venture is profitable, McNeil Specialty is required to fund, as a non-recourse, no-interest loan, 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 Specialty 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 Specialty before any distribution of assets to us. As of December 31, 2000, the joint venture owed McNeil Specialty approximately $5.0 million.

During the year ended December 31, 2000, the joint venture reimbursed Neose approximately $1.6 million for the cost of research and development services and supplies provided to the joint venture. This amount has been reflected as a reduction of research and development expense in our Consolidated Statements of Operations.

We may be required to make additional investments in the joint venture to fund capital expenditures. If the joint venture builds additional production facilities, and we wish to maintain our 50% ownership interest in the joint venture, we are required to invest up to $8.85 million to fund half of such expenditures. However, we may elect to fund as little as $1.85 million of the

cost of the facilities, so long as our aggregate investments in the joint venture are at least 15% of the joint venture's aggregate capital expenditures. In this case, McNeil Specialty will fund the remainder of our half of the joint venture's capital expenditures, and our ownership percentage will be proportionately reduced. We have an option, expiring in September 2006, to return to 50% ownership of the joint venture by reimbursing McNeil Specialty for this amount.

The success of our joint venture with McNeil Specialty is dependent

upon the joint venture's ability to develop, manufacture, sell, and market successfully complex carbohydrates. If the joint venture is unsuccessful in these efforts, it will not be profitable and our business, financial condition, and results of operations may be materially and adversely affected.

Agreement with Bristol-Myers

In 1998, we entered into an agreement with Bristol-Myers Squibb Company to develop proprietary technologies that enable cGMP processes for the manufacture of two gangliosides for use as the active pharmaceutical ingredients in two cancer vaccines being developed by Bristol-Myers. Both vaccine candidates have been licensed to Bristol-Myers from Progenics Pharmaceuticals, Inc. During the years ended December 31, 1999 and 2000, we recorded revenues of $205,000 and $3,320,000, respectively, from Bristol-Myers.

The first of these vaccine candidates, GMK, is in Phase III clinical trials for the treatment of malignant melanoma. In May 2000, Progenics announced that the organization responsible for carrying out one of the Phase III clinical trials for GMK terminated their participation in that trial. Following Progenics' announcement, Bristol-Myers advised us to cease our activities under the agreement until they completed their review of the available data from the clinical trial. We do not expect any future revenues under this agreement unless Bristol-Myers advises us to resume our activities.

Bristol-Myers may terminate the development agreement on 90 days' prior notice. Even if we successfully complete development of these processes, and fulfill all of our obligations under the agreement, Bristol-Myers may not obtain regulatory approval to market either of these vaccines. Further, even if Bristol-Myers obtains regulatory approval to market either of these vaccines, we cannot be sure that Bristol-Myers will enter into a contract with us for the manufacture of complex carbohydrates for the vaccines, or that the terms of a future contract with Bristol-Myers will be favorable to us.

Agreement with Wyeth-Ayerst International

We entered into an agreement in 1999 with Wyeth-Ayerst International, a division of American Home Products, to develop a manufacturing process for a bioactive carbohydrate to be used as an ingredient in Wyeth-Ayerst' infant and pediatric nutritional formula products. We are responsible for developing a large-scale manufacturing process for this ingredient, and Wyeth-Ayerst plans the introduction of this proprietary ingredient into its infant formula lines. We are receiving contract development payments and will receive payments as we achieve milestones specified in the agreement. If Wyeth-Ayerst commercializes an ingredient under this agreement, we will sell product to Wyeth-Ayerst at minimum specified transfer prices.

In 1999, we received from Wyeth-Ayerst a non-refundable, up-front license fee of $500,000, which we are recognizing as revenue ratably over the three-year development program. During the years ended December 31, 1999 and 2000, we recorded revenues of $194,000 and $1,167,000, respectively, from Wyeth-Ayerst.

We may fail to develop a large-scale manufacturing process successfully or in a cost-effective or efficient manner. Even if we successfully develop a process, and fulfill all of our obligations under the agreement, Wyeth-Ayerst

(a development-stage company)

Notes to Consolidated Financial Statements

may fail to obtain regulatory approval to market the ingredient. Moreover, even if Wyeth-Ayerst obtains regulatory approval for the ingredient, Wyeth-Ayerst may determine the incremental cost of adding the ingredient to infant formula exceeds the benefit to Wyeth-Ayerst.

Note 4. Marketable Securities

As of December 31, 1999 and 2000, marketable securities consisted of securities and obligations of either the U.S. Treasury or U.S. government agencies. The following summary contains additional information about our marketable securities (in thousands):

December 31,	1999	2000
Available-for-sale securities		
Cost	$ 9,483	$ 65,085
Gross unrealized gains	--	--
Amortized discount	52	410
Fair value of available-for-sale securities	9,535	65,495
Less amounts classified as cash equivalents	(9,535)	(65,495)
Total available-for-sale securities	--	--
Held-to-maturity securities (at amortized cost)	22,870	27,773
	$ 22,870	$ 27,773

The weighted-average maturity of our marketable securities as of December 31, 2000 was 3 months. During the years ended December 31, 1998 and 1999, we received proceeds from the sales of marketable securities of approximately $1,982,000 and $8,882,000, respectively. Realized gains on these sales for the years ended December 31, 1998 and 1999 were approximately $74,000 and $796,000, respectively. We had no sales of marketable securities, or associated realized gains, during the year ended December 31, 2000.

Note 5. Property and Equipment

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

December 31,	1999	2000
Building and improvements	$ 13,524	$ 13,904
Research equipment	3,068	4,060
Manufacturing equipment	1,178	1,350
Computer and office equipment	528	702
	18,298	20,016
Less accumulated depreciation and amortization	(5,632)	(7,139)
	12,666	12,877
Land	700	700
	$ 13,366	$ 13,577

Depreciation and amortization expense was approximately $1,838,000, $1,380,000, and $1,519,000 for the years ended December 31, 1998, 1999, and 2000, respectively.

Note 6. Other Assets

Acquired Technology

In March 1999, we acquired the carbohydrate manufacturing patents, licenses, and other intellectual property of Cytel Corporation for aggregate consideration of $4.75 million, of which $1.25 million was paid after March 1999 to Epimmune, Inc., Cytel's successor corporation, as it satisfied certain milestones relating to the acquired patents and licenses. We charged $200,000 of the $4.75 million to research and development expense in our Consolidated Statements of Operations in 1998. Because the acquired intellectual property consists of core technology with alternative future uses, we have capitalized the remaining $4.55 million as Acquired Technology, which is included in other assets on the accompanying Consolidated Balance Sheets.

The Acquired Technology balance will be amortized to research and development expense in our Consolidated Statements of Operations over eight years, which we estimate to be the useful life of the technology. Amortization expense relating to the acquired technology for the years ended December 31, 1999 and 2000 was approximately $315,000 and $532,000, respectively.

Investment in Convertible Preferred Stock

In June 2000, we made an investment of $1.25 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. Our investment, which represents an ownership interest of approximately 4%, was made on the same terms as other unaffiliated investors. Accordingly, we have stated the 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, 2000.

Note 7. Long-Term Debt

In 1997, we issued, through the Montgomery County (Pennsylvania) Industrial Development Authority, $9.4 million of taxable and tax-exempt bonds. The bonds were issued to finance the purchase of our previously leased 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 2000, the weighted-average, effective interest rate was 7.5% 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, 2000, we had restricted funds relating to the bonds of $893,000, which consisted of our monthly payments to an escrow account plus interest revenue on the balance of 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 a covenant, which was renegotiated in May 2000, to maintain a minimum required cash and short-term investments balance of at least two times the current loan balance. At December 31, 2000, we were required to maintain a cash and short-term investments balance of $14.6 million, rather than $20 million as required under the original covenant. 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, which was $7.3 million as of December 31, 2000.

Minimum principal repayments of long-term debt as of December 31, 2000 were as follows (in thousands): 2001--$1,100; 2002--$1,100; 2003--$1,200; 2004--$1,200; and thereafter--$2,700 (2005--$100; 2006--$200; 2007--$100; 2008 through 2011--$200; 2012--$300; 2013--$200; 2014--$300; 2015--$200; 2016--$300; and 2017--$200).

Note 8. Accrued Expenses

Accrued expenses consisted of the following (in thousands):

December 31,	1999	2000
Accrued outside research expenses	$ 123	$ 400
Accrued professional fees	348	360
Accrued fixed assets	55	275
Amount due to Magnolia Nutritionals LLC	345	--
Accrued acquired technology	250	--
Accrued other expenses	536	492
	$ 1,657	$ 1,527

Note 9. Stockholders' Equity

Common Stock

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 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. Some of these common shares have registration rights.

From 1991 through 1995, we sold 7,196,884 shares of Series A, B, C, D, E, and F Convertible Preferred Stock. On December 7, 1995, all outstanding shares of Series B Convertible Preferred Stock converted into 472,249 shares of

common stock. As discussed above, in connection with the initial public offering, all outstanding shares of Series A, C, D, E, and F converted into 2,410,702 shares of common stock.

Warrant

In June 1995, we granted a warrant to an equipment finance company to purchase 10,527 shares of common stock at $14.25 per share. The stock warrant, which expires on June 30, 2002, remained outstanding as of December 31, 2000.

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% acquiror's common stock. 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 10. Employee Benefit Plans

Stock Option Plans

We have three stock option plans, the 1991, 1992, and 1995 Stock Option Plans, under which a total of 3,201,666 shares of common stock have been reserved. 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.

We have elected to adopt the disclosure provisions only of Statement of Financial Accounting Standards No. 123, "Accounting for Stock-Based Compensation," or SFAS 123. Accordingly, we apply APB Opinion No. 25, "Accounting for Stock Issued to Employees," and related interpretations in accounting for our stock-based compensation plans. We record deferred compensation for option grants to employees for the amount, if any, the market price per share exceeds the exercise price per share. In addition, we record deferred compensation for option grants to non-employees in the amount of the fair value per share, as computed using the Black-Scholes option-pricing model and variable plan accounting. We amortize deferred compensation amounts over the vesting periods of each option. We recognized compensation expense of approximately $311,000, $477,000, and $1,083,000 for the years ended December 31, 1998, 1999, and 2000, 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 1998, 1999, and 2000 grants, respectively:

risk-free interest rate of 4.6%, 5.9%, and 4.7%; an expected life of 5.1, 5.2, and 4.3 years; volatility of 60%, 60%, and 75%; and a dividend yield of zero. If we had elected to record compensation cost for our stock-based compensation plans consistent with SFAS 123, our net loss and basic and diluted net loss per share would have been increased to the pro forma amounts indicated below (in thousands, except per share data):

	1998	1999
Net loss - as reported	$ (11,907)	$ (13,318)
Net loss - pro forma	$ (14,756)	$ (15,853)
Basic and diluted net loss per share - as reported	$ (1.25)	$ (1.25)
Basic and diluted net loss per share - pro forma	$ (1.54)	$ (1.48)

A summary of the status of our stock option plans as of December 31, 1998, 1999, 2000 and changes during each of the years then ended, is presented below:

	1998		1999		
	Number Outstanding	Weighted-Average Exercise Price Per Share	Number Outstanding	Weighted-Average Exercise Price Per Share	Number Outstandi
Balance at January 1	1,564,176	$ 11.73	1,785,489	$ 12.15	2,152,
Granted	312,212	13.38	443,626	13.22	616,
Exercised	(50,320)	5.40	(35,663)	7.41	(247,
Canceled	(40,579)	13.69	(41,415)	14.15	(13,
Balance at December 31	1,785,489	$ 12.15	2,152,037	$ 12.41	2,506,
Options exercisable at December 31	930,954	$ 9.82	1,242,583	$ 11.07	1,412,

The following table summarizes information about stock options outstanding as of December 31, 2000:

Options Outstanding					Option
Range of Exercise Prices	Number Outstanding	Weighted-Average Remaining Life (Years)	Weighted-Average Exercise Price		Number Exercisable
$ 0.90 - $13.50	1,020,313	5.9	$ 9.56		758,586
$ 13.63 - $ 20.00	843,640	7.1	15.51		598,915
$ 21.00 - $ 41.13	642,948	9.7	29.25		54,998
$ 0.90 - $ 41.13	2,506,901	7.3	$ 16.61		1,412,499

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,	1998	1999	2000
Price = Market Value			
Options granted	306,165	397,366	608,900
Weighted-average exercise price	$ 13.55	$ 12.17	$ 29.27
Weighted-average fair value	$ 7.48	$ 6.89	$ 17.56
Price > Market Value			
Options granted	--	40,000	--
Weighted-average exercise price	$ --	$ 25.00	$ --
Weighted-average fair value	$ --	$ 5.50	$ --
Price <Market Value			
Options granted	6,047	6,260	7,240
Weighted-average exercise price	$ 4.92	$ 4.75	$ 4.83
Weighted-average fair value	$ 11.40	$ 11.01	$ 11.54

The weighted-average fair value of employee purchase rights granted under our employee stock purchase plan (see below) in 1998, 1999, and 2000 was $6.05, $6.25, and $8.45, respectively. The fair value of the purchase rights was estimated using the Black-Scholes model with the following weighted-average assumptions for 1998, 1999, and 2000, respectively: risk-free interest rate of 4.6%, 6.5, and 5.0%; an expected life of seventeen, eighteen, and fourteen months; volatility of 60%, 60%, and 70%; and a dividend yield of zero.

Employee Stock Purchase Plan

We maintain an employee stock purchase plan, or ESPP, that allows any eligible employee the opportunity to purchase shares of our common stock through payroll deductions at the end of semiannual purchase periods. Any employee who is expected to work at least 20 hours per week for at least five months per calendar year is eligible to participate. The ESPP, which became effective in February 1996, provides for successive, two-year offering periods, each of which is contemplated to have four semiannual purchase periods. Pursuant to the ESPP, 100,000 shares of common stock were reserved for issuance. The purchase price 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 61,632, 46,092, and 35,102 shares of common stock remained available for issuance under the ESPP at December 31, 1998, 1999, and 2000, respectively. The total purchases of common stock under the ESPP during the years ended December 31, 1998, 1999, and 2000, were 15,080 shares at a total purchase price of approximately $171,000, 15,540 shares at a total purchase price of approximately $156,000, and 10,990 shares at a total purchase price of approximately $157,000, respectively. We have not recorded any compensation expense for the ESPP.

Note 11. Commitments

Leases

In October 1999, we entered into a two-year lease agreement for laboratory and office space in California. Our rental expense for the years ended December 31, 1999 and 2000 was approximately $19,000 and $77,000, respectively. As of December 31, 2000, our future minimum payments under this lease are approximately $58,000.

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.

Note 12. Income Taxes

As of December 31, 2000, we had net operating loss carryforwards for federal and state income tax purposes of approximately $9,624,000 and $4,985,000, respectively. In addition, we had federal research and development credit carryforwards of approximately $2,129,000. These carryforwards begin to expire in 2004. Due to the uncertainty surrounding the realization of the tax benefit associated with these 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,	1999	2000
Benefit of net operating loss carryforwards	$ 3,159	$ 3,760
Research and development credit carryforwards	1,497	2,129
Capitalized research and development	10,615	11,890
Start-up costs	7,204	9,411

Nondeductible depreciation and amortization	2,414	3,242
Deferred compensation	493	905
Accrued expenses not currently deductible	352	209
Deferred revenue	192	124
Tax benefit of option exercises	(303)	(2,139)
Other	(165)	4
	25,458	29,535
Valuation allowance	(25,458)	(29,535)
	$ --	$ --

Note 13. Related-Party Transactions

Paramount Capital, Inc., of which the sole shareholder is a member of our Board of Directors, acted as a finder for our private placement of common stock in June 1999 (see Note 9). We paid Paramount Capital $783,750 for its assistance in completing the private placement. Entities affiliated with Paramount Capital purchased 110,000 shares of common stock in the private placement.

In 1997, we entered into a consulting agreement with an employee of Paramount Capital. Under the agreement, which may be terminated by either party upon sixty days prior notice, we are obligated to pay the consultant an annual amount of $50,000. During 1999, we granted the consultant an option to purchase 30,000 shares of common stock at an exercise price of $10.38, the market price on the date of grant. The option vests in equal, annual amounts in 2002 and 2003.

EXHIBIT INDEX

Exhibit Number	Description
3.1	Second Amended and Restated Certificate of Incorporation. (Exhibit 3.1)(1)
3.2	Amended and Restated By-Laws. (Exhibit 3.3)(5)
3.3	Certificate of Designation establishing and designating the Series A Junior Participating Preferred Stock. (Exhibit 3.2)(5)
4.2	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)(3)
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)(3)
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)(3)
4.5	Amended and Restated Rights Agreement, dated as of December 3, 1998, between American Stock Transfer & Trust Company, as Rights Agent, and Neose. (Exhibit 4.1)(6)
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)(10)
10.1	Stock Purchase Agreement, dated as of August 28, 1990, between University of Pennsylvania and Neose. (Exhibit 10.1)(1)
10.2	License Agreement, dated as of August 28, 1990, between University of Pennsylvania and Neose, as amended to date. (Exhibit 10.2)(1)
10.3(a)+	Series D Preferred Stock Purchase Agreement, dated as of December 30, 1992, between Abbott Laboratories and Neose. (Exhibit 10.8(a))(1)
10.3(b)+	Supply Agreement, dated as of December 30, 1992, between Abbott Laboratories and Neose. (Exhibit 10.8(b))(1)
10.3(c)+	Research and License Agreement, dated as of December 30, 1992, between Abbott Laboratories and Neose. (Exhibit 10.8(c))(1)
10.3(d)+	Amendment to the Research and License Agreement, dated as of January 18, 1995, between Abbott Laboratories and Neose. (Exhibit 10.8(d))(2)
10.4	Form of Series E Preferred Stock Investors' Rights Agreement. (Exhibit 10.9)(1)
10.5	Form of Series F Preferred Stock Investors' Rights Agreement. (Exhibit 10.10)(1)
10.6	Form of Warrant to Purchase Common Stock, dated as of February 23, 1991. (Exhibit 10.11)(1)
10.7	Form of Warrant to Purchase Common Stock, dated as of June 30, 1993. (Exhibit 10.12)(1)
10.8	Form of Warrant to Purchase Common Stock, dated as of February 16, 1994. (Exhibit 10.13)(1)
10.9	Form of Warrant to Purchase Series E Preferred Stock, dated as of July 29, 1994. (Exhibit 10.14)(1)
10.10	Warrant for the Purchase of Common Stock, dated as of June 30, 1995, between Financing for Science International, Inc. and Neose. (Exhibit 10.15)(1)
10.11++	1995 Stock Option/Stock Issuance Plan, as amended. (Exhibit 99.1)(4)
10.12++	Employee Stock Purchase Plan. (Exhibit 10.17)(1)
10.13++	Employment Agreement dated April 1, 1992, between David A. Zopf and Neose, as amended to date. (Exhibit 10.18)(1)
10.14++	Employment Agreement dated December 1, 1994, between P. Sherrill Neff and Neose. (Exhibit 10.19)(1)
10.15	Agreement for Purchase and Sale of Real Property, dated March 14, 1997, by and between Pennsylvania Business Campus Delaware, Inc. and Neose. (Exhibit 2.1)(3)
10.16	Loan Agreement, dated as of March 1, 1997, between Montgomery County Industrial Development Authority and Neose. (Exhibit 10.1)(3)
10.17	Participation and Reimbursement Agreement, dated as of March 1, 1997, between Jefferson Bank and CoreStates Bank, N.A. (Exhibit 10.2)(3)
10.18	Form of CoreStates Bank, N.A. Irrevocable Letter of Credit. (Exhibit 10.3)(3)
10.19	Pledge, Security and Indemnification Agreement, dated as of March 1, 1997, by and among CoreStates Bank, N.A., Jefferson Bank, and Neose. (Exhibit 10.4)(3)
10.20	Reimbursement Agreement, dated as of March 1, 1997, between Jefferson Bank and Neose. (Exhibit 10.5)(3)
10.21	Specimen of Note from Company to Jefferson Bank. (Exhibit 10.6)(3)
10.22	Mortgage, Assignment and Security Agreement, dated March 20, 1997, between Jefferson Bank and Neose. (Exhibit 10.7)(3)
10.23	Security Agreement, dated as of March 1, 1997, by and between Jefferson Bank and Neose. (Exhibit 10.8)(3)

10.24	Assignment of Contract, dated as of March 20, 1997, between Jefferson Bank and Neose. (Exhibit 10.9)(3)
10.25	Custodial and Collateral Security Agreement, dated as of March 20, 1997, by and among Offitbank, Jefferson Bank, and Neose. (Exhibit 10.10)(3)
10.26	Placement Agreement, dated March 20, 1997, among Montgomery County Industrial Development Authority, CoreStates Capital Markets, and Neose. (Exhibit 10.11)(3)
10.27	Remarketing Agreement, dated as of March 1, 1997, between CoreStates Capital Markets and Neose. (Exhibit 10.12)(3)
10.28	Form of Purchase Agreement dated as of June 25, 1999, between Neose Technologies, Inc. and the purchasers set forth on the signature pages thereto. (Exhibit 99.1)(7)
10.29	Form of Amended and Restated Purchase Agreement dated as of June 25, 1999, between Neose Technologies, Inc. and the purchasers set forth on the signature pages thereto. (Exhibit 99.2)(7)
10.30	Research and Development Agreement, dated June 1, 1998, between Neose Technologies, Inc. and the Pharmaceutical Research Institute of Bristol-Myers Squibb Company. (Exhibit 99.1)(8)
10.31	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)(8)
10.32	Collaboration and License Agreement, dated November 3, 1999, between Neose Technologies, Inc. and American Home Products Corporation. (Exhibit 99.3)(8)
10.33	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. (Exhibit 10.1)(9)
10.34	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. (Exhibit 10.2)(9)
10.35*++	Employment Offer Letter dated November 27, 2000, between Eric Sichel and Neose.
11*	Statement re: Computation of Net Loss Per Common Share.
23.1*	Consent of Arthur Andersen LLP.
24*	Powers of Attorney (included as part of signature page hereof).

---

* 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.

(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 Registration Statement on Form S-1 (Registration No. 333-19629) filed with the SEC on January 13, 1997.

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

(4) Filed as an Exhibit to our Registration Statement on Form S-8 (Registration No. 333-47718) filed with the SEC on October 11, 2000.

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

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

(7) Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on July 14, 1999.

(8) Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on February 2, 2000.
(9) Filed as an Exhibit to our Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2000.
(10) Filed as an Exhibit to our Current Report on Form 8-K filed with the SEC on November 15, 2000.