-----BEGIN PRIVACY-ENHANCED MESSAGE----- Proc-Type: 2001,MIC-CLEAR Originator-Name: webmaster@www.sec.gov Originator-Key-Asymmetric: MFgwCgYEVQgBAQICAf8DSgAwRwJAW2sNKK9AVtBzYZmr6aGjlWyK3XmZv3dTINen TWSM7vrzLADbmYQaionwg5sDW3P6oaM5D3tdezXMm7z1T+B+twIDAQAB MIC-Info: RSA-MD5,RSA, PLN2Eox/EsrL5Q7Slk1a8D0Eq+1fbMe2lbcqHN70GtDwP1ahzBFFBDab4KeHpbww FZ80Nlq47QkEd2xKiROIuA== 0000921895-99-000164.txt : 19990325 0000921895-99-000164.hdr.sgml : 19990325 ACCESSION NUMBER: 0000921895-99-000164 CONFORMED SUBMISSION TYPE: 10-K PUBLIC DOCUMENT COUNT: 6 CONFORMED PERIOD OF REPORT: 19981231 FILED AS OF DATE: 19990324 FILER: COMPANY DATA: COMPANY CONFORMED NAME: SHEFFIELD PHARMACEUTICALS INC CENTRAL INDEX KEY: 0000894158 STANDARD INDUSTRIAL CLASSIFICATION: PHARMACEUTICAL PREPARATIONS [2834] IRS NUMBER: 133808303 STATE OF INCORPORATION: DE FISCAL YEAR END: 1231 FILING VALUES: FORM TYPE: 10-K SEC ACT: SEC FILE NUMBER: 001-12584 FILM NUMBER: 99571856 BUSINESS ADDRESS: STREET 1: 425 WOODSMILL RD CITY: ST LOUIS STATE: MO ZIP: 63017 BUSINESS PHONE: 3145799899 MAIL ADDRESS: STREET 1: 425 WOODSMILL RD CITY: ST LOUIS STATE: MO ZIP: 63017 FORMER COMPANY: FORMER CONFORMED NAME: SHEFFIELD MEDICAL TECHNOLOGIES INC DATE OF NAME CHANGE: 19940606
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FORM 10-K

SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

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

For the fiscal year ended December 31, 1998

OR

[ ] TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 (NO FEE REQUIRED)

Commission file number 1-12584

SHEFFIELD PHARMACEUTICALS, INC.
(EXACT NAME OF REGISTRANT AS SPECIFIED IN ITS CHARTER)

DELAWARE	13-3808303
(STATE OF INCORPORATION)	(IRS EMPLOYEE IDENTIFICATION NUMBER)

425 SOUTH WOODSMILL ROAD ST. LOUIS, MISSOURI	63017 (ZIP CODE)	(314) 579-9899 (REGISTRANT'S TELEPHONE, INCLUDING AREA CODE)
(ADDRESS OF PRINCIPAL EXECUTIVE OFFICES)		

SECURITIES REGISTERED PURSUANT TO SECTION 12(B) OF THE ACT:

TITLE OF CLASS	NAME OF EACH EXCHANGE ON WHICH REGISTERED
Common Stock. $.01 par value	American Stock Exchange

SECURITIES REGISTERED PURSUANT TO SECTION 12(G) OF THE ACT:

None

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 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. [X]Yes [ ] No

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

The aggregate market value at March 19, 1999 of the voting stock of the registrant held by non-affiliates (based upon the closing price of $2.25 per share of such stock on the American Stock Exchange on such date) was approximately $49,178,000. Solely for the purposes of this calculation, shares held by directors and officers and beneficial owners of 10% or more of the Company's Common Stock of the registrant have been excluded. Such exclusion should not be deemed a determination or an admission by the registrant that such individuals are, in fact, affiliates of the registrant.

Indicate the number of shares outstanding of each of the registrant's classes of common equity, as of the latest practicable date: At March 19, 1999, there were outstanding 27,083,419 shares of the registrant's Common Stock, $.01 par value.

PART I

ITEM 1. BUSINESS

GENERAL

Sheffield Pharmaceuticals, Inc. (the "Company") is a specialty pharmaceutical company focused on development and commercialization of later stage, lower risk pharmaceutical products that utilize the Company's unique proprietary pulmonary delivery technologies. The Company is in the development stage and as such has been principally engaged in the development of its pulmonary delivery systems.

The Company has strategic alliances for pulmonary delivery development with Elan Corporation, plc ("Elan"), Siemens AG ("Siemens") and Zambon Group SpA ("Zambon"). The Company believes that a less costly, more predictable path to commercial development of therapeutics can be achieved through the creative use of collaborations and alliances, combined with state-of-the-art technology with experienced management. The Company is applying this strategy to the development of both respiratory and systemic pharmaceutical products to be delivered through the Company's proprietary pulmonary delivery systems.

In 1997, the Company acquired the Metered Solution Inhaler ("MSI") pulmonary delivery system through a worldwide exclusive license and supply arrangement with Siemens. During the second half of 1998, the Company acquired the rights to an additional pulmonary delivery technology, the Aerosol Drug Delivery System ("ADDS") from a subsidiary of Aeroquip-Vickers, Inc. ("Aeroquip-Vickers"). The ADDS technology is a new generation propellant-based pulmonary delivery system.

Using these pulmonary delivery systems as platforms, the Company has established strategic alliances for developing the initial products. In a collaboration with Zambon, the Company is developing a range of pharmaceutical products delivered by the MSI to treat respiratory diseases. As part of the strategic alliance with Elan, a world leader in pharmaceutical delivery technology, the Company is developing therapies for systemic diseases to be delivered to the lungs. The initial systemic programs are for therapies in the breakthrough pain and migraine headache markets. Elan licensed two of its own delivery technologies to the Company that complement the MSI and ADDS technologies. Outside of its alliances, the Company owns the worldwide rights to respiratory disease applications of all of its technologies, subject only to the MSI respiratory rights licensed to Zambon.

The Company's approach to its business is to maximize the application of Company resources toward product development and to minimize infrastructure and related overhead costs. The Company does not currently have sales or marketing capabilities.

Sheffield Medical Technologies Inc. ("Sheffield") was incorporated under Canadian law in October 1986. In May 1992, the Company became domesticated as a Wyoming corporation pursuant to a "continuance" procedure under Wyoming law. In January 1995, the Company's shareholders approved the proposal to reincorporate Sheffield in Delaware, which was effected on June 13, 1995. On January 10, 1996, Ion Pharmaceuticals, Inc. ("Ion"), was formed as a wholly owned subsidiary of the Company. At that time, Ion acquired the Company's rights to certain early stage biomedical technologies. On April 17, 1997, CP Pharmaceuticals, Inc. ("CP") was formed for the purpose of acquiring Camelot Pharmacal, L.L.C., a privately held pharmaceutical development company, which acquisition was consummated on April 25, 1997. In June 1997, the Company's shareholders approved the proposal to change Sheffield's name from Sheffield Medical Technologies Inc. to Sheffield Pharmaceuticals, Inc. As part of an agreement with Elan, on June 30, 1998, Systemic Pulmonary Delivery, Ltd. ("SPD") was formed as a wholly owned subsidiary of the Company. At that time, SPD acquired the Company's rights to the systemic applications of the MSI and acquired Elan's rights to certain pulmonary delivery technologies. Unless the context requires otherwise, Sheffield, Ion, CP and SPD are referred herein to as "the Company".

The Company's headquarters are located at 425 South Woodsmill Road, Suite 270, St. Louis, Missouri 63017-3441 and its telephone number is (314) 579-9899.

BUSINESS STRATEGY

The Company's business strategy is to seek out opportunities to acquire and develop commercially attractive pharmaceutical products, primarily in the area of pulmonary drug delivery. Where possible, the Company intends to enter into joint ventures or other forms of strategic alliances to

defray or reduce significant development and manufacturing costs associated with these opportunities that otherwise might be borne by the Company while retaining certain commercial rights. As commercialization nears, the Company intends to add or obtain access to a specialty pharmaceutical sales force in the United States, as well as the attendant marketing infrastructure.

The Company will to continue to be opportunistic in the acquisition and/or in-licensing of technologies or products that meet the Company's strategic objectives. Such opportunities include: (1) technologies or products that meet the needs of healthcare communities that are not currently served, (2) technologies or products that can cost effectively be developed when viewed in light of the commercial opportunity and competitive environment within the U.S. market, (3) technologies or products that will be of substantive interest to other companies with regard to co-development and co-promotion with limited incremental investment by the Company, and (4) products and technologies with the potential for marketing to a specialty group or limited physician audience. The Company plans to pay special attention to platform technologies that can be developed into multiple applications in varying therapeutic categories.

PULMONARY DELIVERY MARKET ENVIRONMENT

The Company competes in the pulmonary delivery market. The principal use of pulmonary delivery has been in the treatment of respiratory diseases such as asthma, chronic obstructive pulmonary disease ("COPD") and cystic fibrosis. In 1998, industry sources estimate there were approximately 35.5 million asthma patients and 49.5 million COPD patients in the world. These sources indicate that the number of newly diagnosed patients is growing at a rate in excess of 10% annually due to an increase in worldwide air pollution levels and the overall aging of the population. By the year 2005, the Company expects that there will be more than 19 million asthma patients in the United States alone.

In addition, the competitive marketplace has been significantly affected by the worldwide phase out of Chlorofluorocarbons (CFCs) pursuant to the Montreal Protocol. CFCs are the propellants used for MDIs, which are the most common form of pulmonary delivery. Companies in the respiratory market have initiated significant programs to redevelop existing products using alternative propellants, dry powders or nebulizers.

There is considerable interest in applying pulmonary delivery technology to systemic therapies that would benefit from the relatively easy access to the circulatory system through the lungs. Work on pulmonary delivery of insulin by other pulmonary delivery companies has received significant public notice. There is a range of therapies that could provide a significant market opportunity if available in a pulmonary delivered form. There is also significant advantage in aerosol therapy for respiratory disease. It delivers the medication directly onto the lung epithelial surfaces. In many cases, this means that drugs can be effective in very low doses -- eliminating the side effects usually associated with systemic administration.

Today, three types of devices are widely used in metered dose administration: metered dose inhalers, dry powder inhalers, and nebulizers.

METERED DOSE INHALERS. Currently, metered dose inhalers ("MDIs") are the most commonly used pulmonary delivery systems. It is estimated that in the United States, 80% of pulmonary drug delivery is via MDI, with the majority of this use coming from adults with asthma and COPD.

The main components of an MDI include a canister containing the drug mixed with propellant and surfactant, a mouthpiece that acts as the delivery conduit and the actuator seat for the release of the drug. The initial velocity of particles as they leave an inhaler is very high -- approximately 60 mph -- resulting in wasted drug if the patient is not able to coordinate his/her breath with the delivery of aerosol into the mouth. A number of studies have demonstrated that as many as 60% of patients cannot accurately time their inspiration with the actuation of their inhaler which results in under medication and lack of compliance. Typically, only 20% of delivered drug actually reaches the lungs.

The primary advantages of an MDI include its small size, portability, quick usage time, and its availability for use with most respiratory drugs. Disadvantages of an MDI include patient coordination issues and efficient dose delivery. Additionally, because the use of chlorofluorocarbon ("CFC") propellants traditionally used in MDIs is being phased out by international agreement (Montreal Protocol), alternative propellants and formulations are being developed. Over time, all current MDI users will be required to move to a non-CFC MDI or other alternative delivery systems. The majority of U.S. patients favor aerosol MDIs although a sizable percentage may not coordinate them properly.

DRY POWDER INHALERS. Dry powder inhalers ("DPIs") were introduced in the 1960s as single-dose inhalers. In these devices, the drug is loaded as a unit dose that is mechanically released as a powder for inhalation prior to each use. To date, these relatively cumbersome systems have been the primary form of DPI available in the United States, and account for approximately 1% of the total aerosol delivery market.

The inconvenience of the single dose DPI has been overcome outside of the U.S. with the development and introduction of multi-dose DPIs that can deliver up to 200 doses of medication. However, like the single dose systems, they are inspiratory flow rate dependent, that is, the amount of drug delivered to the lung depends on the patient's ability to inhale.

Two of the most significant advantages of DPIs include (1) no hand-breath coordination is required as with MDIs; and (2) they contain no CFCs. However, most require a high inspiratory flow rate, which can be problematic in younger patients or

patients with compromised lung function. In addition, they often present difficulties for those with manual disabilities (e.g., arthritis) or limited vision and, depending upon the powder load delivered, they may induce acute bronchospasm in sensitive individuals. Additionally, multi-dose powder inhalers are subject to moisture sensitivity either from the environment or patient breath and have had difficulty meeting U.S. regulatory standards for dose-to-dose variation.

NEBULIZERS. The third widely used aerosol delivery system is the nebulizer. Jet nebulizers, which are the most commonly used nebulizer, work on a stream of compressed air or oxygen that is forced through a narrow tube lying just above the surface of the liquid to be nebulized. It takes approximately 10 to 15 minutes to nebulize this amount of liquid. Studies suggest keeping the duration of nebulization below 10 minutes, as longer durations are associated with poor compliance. During nebulization only about 10% of the drug is delivered to the lungs; about 80% gets trapped in the reservoir, tubing and mask; the rest is exhaled.

Nebulizers can be used for a wide range of patients, but are especially useful for those old and young patients who cannot manage other inhaler devices. Nebulizers also play a key role in emergency room and intensive care treatment for patients with acute bronchospasm. Another feature exclusive to nebulizers is that a mixture of drugs can be administered in one sitting. However, currently approved nebulizers are bulky table-top units that are time consuming, have a high initial cost (often in excess of the amount reimbursable by managed care) and can be noisy during operation.

SHEFFIELD'S PULMONARY DELIVERY PLATFORMS

The Company recognizes that no single technology in the area of pulmonary drug delivery will meet the needs of patients and providers of the wide variety of compounds (both for respiratory disease and systemic disease therapy) that may benefit therapeutically and commercially from pulmonary delivery. As a result, it remains the Company's goal to acquire or in-license a portfolio of pulmonary delivery technologies to meet the broadest based market opportunity.

For this reason, the Company acquired worldwide, exclusive rights to the Siemens-developed Metered Solution Inhaler ("MSI"), a portable nebulizer-based pulmonary delivery system. This was also the rationale for the acquisition in mid 1998 from Aeroquip-Vickers of the Aerosol Drug Delivery System ("ADDS") technology, an improved version of the MDI. In addition, as part of its alliance with Elan, the Company acquired the rights to two Elan-developed technologies, the Ultrasonic Pulmonary Drug Absorption System ("UPDAS") and a therapeutic agent to enhance absorption of drugs in the deep lungs ("Enhancing Technology").

In keeping with the Company's strategy of minimizing infrastructure and capital required to bring products to market, the Company partnered the development of respiratory products in the MSI with Zambon. Under its agreement with Zambon, MSI commercial rights for respiratory products have been sublicensed to Zambon, with the Company maintaining co-promotion rights for

the U.S. market. The Company's ability to co-promote MSI respiratory products in the U.S. requires no additional payment by the Company. Zambon has committed to fund the development costs for respiratory compounds delivered by the MSI as well as making certain milestone payments and royalties on net sales resulting from these MSI products to the Company.

The ADDS technology, acquired by the Company in mid-1998, along with certain applications of the MSI, have become the focus of a strategic alliance with Elan for development for pulmonary delivery of drugs for treatment of systemic (non-respiratory) diseases. Two Elan technologies have also been licensed to the venture. The Company has retained exclusive rights outside of the strategic alliance to respiratory disease applications utilizing the ADDS technology and the two Elan technologies. Two systemic compounds for pulmonary delivery are currently under development, one in the MSI for breakthrough pain and one for migraine in the ADDS.

The Company is in discussions with an aerosol manufacturer with regard to the manufacture of both systemic and respiratory drugs in the ADDS. The Company is also in discussions with a range of pharmaceutical and biotechnology companies about potential collaborations for developing specific compounds (both respiratory and systemic) in ADDS. Unlike the MSI, ADDS is a technology that lends itself to individual product applications in the respiratory market. While the ADDS technology may be applicable to a wide range of respiratory products, the Company believes that a full line of products delivered by ADDS is not necessary for commercial success. The reverse is true with the MSI, since one of the MSI's primary competitive advantages is the delivery of a range of drugs in interchangeable cartridges used with the parent nebulizer device.

METERED SOLUTION INHALER

The Company owns the worldwide rights to the Metered Solution Inhaler, a patented state-of-the-art, multi-dose nebulizer delivery system from Siemens AG, the multi-national engineering and electronics conglomerate. Worldwide development responsibility and commercial rights for respiratory products in the MSI have been licensed to Zambon Group SpA in return for an equity investment in the Company (approximately 10%), milestone payments and royalties on net sales. The Company retains U.S. co-promotion rights.

The MSI pulmonary drug delivery system has been developed to provide the therapeutic benefit of nebulization with the convenience of pressurized metered dose inhalers (MDIs) in one system. The MSI was developed to meet specific needs within the respiratory market, particularly for pediatric and geriatric patients suffering from asthma and COPD.

Albuterol in the MSI is currently the subject of an Investigational New Drug Application ("IND") with the Food and Drug Administration ("FDA"). A Phase I/II study being conducted by Zambon at the University of Maryland under this IND. The Company expects this study will be completed late in the first quarter of 1999.

DESCRIPTION OF THE MSI

The MSI is comprised of two main components: a reusable,

pocket-size inhaler unit developed and manufactured for the Company by Siemens AG, a global leader in electronics and technology and interchangeable drug cartridges containing multiple doses of drug in solution. Arrangements have been made for the drug- containing cartridges to be filled and assembled at Chesapeake Biological Laboratories of Baltimore, Maryland. The cartridges are an integral part of the total system and the cartridge plus each drug formulation will be the subject of a separate drug device combination New Drug Application ("NDA").

The basic technology of the system involves the rapid nebulization of therapeutic agents using ultrasonic waves. This produces a concentrated cloud of medication delivered through the mouthpiece over a two to three second period for inhalation. The key components of the technology are housed in the inhaler unit. They are the rechargeable battery-operated motor, ultrasonic horn and drug cartridge. The pocketsize MSI allows for administration of a range of drugs in a single, simple-to-use, environmentally friendly delivery system. Each cartridge contains, depending on formulation, approximately a one to two month supply of drug.

To use the MSI system, a patient simply selects the appropriate color-coded drug cartridge and places it into the chamber of the inhaler unit. Pressing the "on" button activates a small electrical motor that transports a precise dose of drug from the cartridge chamber to the ultrasonic horn -- transforming the solution into an aerosolized cloud. The patient's inspiratory breath carries this cloud of medication directly to the lungs where it is needed. The dose delivered by the MSI is very accurate and consistent because: (1) the MSI is designed to be inspiratory flow rate independent; that is, delivery of the drug does not depend upon the patient's ability to inhale forcefully, and (2) the MSI does not require a high level of coordination between inspiration and actuation of the device. The patient's natural breath carries the medication directly to the lungs, minimizing the amount of drug deposited in the mouth and throat.

MSI ADVANTAGES

The Company believes that the MSI provides significant advantages over other drug delivery systems. It is particularly suited for younger and older asthma patients, as well as for older COPD patients who have difficulty using MDIs and currently have to depend on larger, more time-consuming tabletop nebulizers for delivery of their medications. These potential advantages include:

ACCURACY. The superior engineering and patient-friendly design of the MSI is intended to provide minimal dose to dose variability. Patients can therefore expect to receive the right therapeutic dose consistently. Recent testing with the MSI system found dose-to-dose variability significantly better than the current FDA requirement.

ENHANCED PATIENT COMPLIANCE. The pocketsize, portable MSI unit is designed to combine the therapeutic benefits of nebulization with the convenience of pressurized metered dose inhalers. The drug dose is precisely measured and delivered in seconds, as compared to 10 to 15 minutes or more for the typical nebulizer. The device is easy to operate, requiring

minimal coordination between actuation and inhalation for proper drug delivery. These benefits are expected to improve patient compliance with the proper administration of their respiratory medication. Another expected factor in enhanced patient compliance is the broad range of drugs that can be accommodated by the MSI, allowing patients on multiple medications to rely on one simple delivery system.

INSPIRATORY FLOW RATE INDEPENDENCE. Unlike most of the DPIs currently available (or in development), the MSI is designed to achieve a consistent and significant level of drug deposition over a broad range of inspiratory flow rates. This is especially important in younger patients or patients with compromised lung function (e.g., during an asthma attack) who have a difficult time breathing normally.

VERSATILITY. Many asthma and COPD patients are taking multiple inhalation medications. The MSI accommodates interchangeable drug cartridges to allow for the administration of a broad range of frequently used respiratory drugs in a single, simple-to-use delivery system. The system includes an early warning mechanism that signals when the batteries need recharging or when the dosator is not functioning properly and a dose counter indicating when a new inhaler unit is required. These user-friendly features result in a simplified dosing procedure for both patients and their caregivers.

PULMONARY TARGETING. The particle size of the inhaled medication affects the effectiveness of drug delivery to the lung. Generally, a drug is "respirable" if the particle size is between two and five microns. Larger particles tend to deposit in the inhaler or in the patient's mouth and throat. Smaller particles tend to be exhaled. Within the respirable range, the MSI is designed to deliver particles specifically targeted for certain portions of the lungs, the central lung for local treatment or the deep lung for enhanced absorption into the blood stream for systemic therapies.

ENVIRONMENTALLY FRIENDLY. CFCs, the most commonly used propellant for MDI aerosols, are believed to adversely affect the Earth's ozone layer. They are subject to worldwide regulations aimed at eliminating their production and use within the decade under the Montreal Protocol. The MSI does not use CFCs or any other type of ozone depleting propellant.

ECONOMICAL. The Company believes that the MSI offers significant value to the patient because it is designed to allow a single device to be used with a complete family of respiratory medications available in cost-effective interchangeable cartridges. The inhaler unit itself is expected to have a life of two to three years. The initial cost of the inhaler unit is expected to be within the cost range that managed care providers will reimburse patients. The Company anticipates the combined cost to the patient of the device plus the drug filled cartridges will be comparable to the average cost per dose of the standard metered dose inhaler.

MSI PRODUCT PIPELINE IN DEVELOPMENT

Through development alliances with strategic partners, Zambon and Elan, the Company is implementing a broad development strategy for the MSI. The Company and Zambon are developing a range of widely used respiratory drugs for delivery in the MSI. Potential candidates for respiratory disease therapy include albuterol, ipratropium, cromolyn, inhaled bronchial steroids and combination products, which are described below. Most patients who experience respiratory disease commonly use multiple medications to treat their conditions. The initial Phase I/II clinical trial on albuterol in the MSI is expected to be completed in the first quarter of 1999. The Company anticipates completion of the albuterol development program and submission of the drug device combination NDA in the second half of 2000. The Company and Zambon intend to initiate additional clinical trials for other respiratory therapies in the MSI during 1999.

Among the drugs planned for development for the MSI system are:

ALBUTEROL. Albuterol is a beta agonist used as rescue therapy for patients with asthma and chronic obstructive pulmonary disease. It is the largest selling respiratory compound with U.S. sales of over $500 million in all dosage forms. It is available in a metered dose inhaler and nebulizer solution as well as solid and liquid dosage forms.

IPRATROPIUM. Ipratropium is a bronchodilator used primarily to treat COPD patients. It is useful because of its anticholinergic properties, which reduce pulmonary congestion. It is available in a metered dose inhaler, nebulizer solution and a combination product with albuterol.

CROMOLYN. Cromolyn is a non-steroidal, anti-inflammatory drug used to reduce the underlying bronchial inflammation associated with asthma. It is extremely safe and it is most commonly used to treat pediatric patients. It is available in a metered dose inhaler and nebulizer solution.

INHALED BRONCHIAL STEROIDS. Inhaled bronchial steroids are anti-inflammatory agents. They address the underlying inflammation in the lungs of asthma and COPD patients. They are available in a metered dose inhaler. Steroids are the fastest growing category in the respiratory market, growing at 25% per year.

OTHER RESPIRATORY THERAPIES. In addition to the drugs listed above, the Company and Zambon are assessing the market potential for a range of additional respiratory therapies. These therapies are expected to include a combination of an anti-inflammatory and beta agonist, and an anticholinergic and beta agonist, as well as antibiotics, cystic fibrosis treatments and a range of early stage biotech compounds that target respiratory disease.

MSI SYSTEMIC MEDICATIONS - PAIN MANAGEMENT. Through its development alliance with Elan, the Company will develop certain drugs for systemic treatment by pulmonary delivery through the MSI. The first of these drugs will be a compound for the treatment of severe pain. The pain management market includes patients with cancer, post-operative, migraine headache and chronic persistent pain. Narcotic analgesics for treatment of these severe forms of pain are estimated to exceed $5.5 billion in worldwide sales in the year 2000. The Company has identified a market opportunity for a rapid-acting, non-invasive treatment for breakthrough pain and is undertaking pre-clinical formulation and system feasibility development on an analgesic compound for pulmonary delivery in the MSI.

AEROSOL DRUG DELIVERY SYSTEM

The Company's Aerosol Drug Delivery System is a novel, proprietary inhaled-drug delivery system that is currently undergoing preclinical feasibility trials for delivery of both respiratory (local) and systemic drugs. The ADDS technology represents a new generation MDI.

The ADDS technology was developed to correct major deficiencies associated with existing MDI technology. MDIs have provided convenient, safe, self-administered treatment for over 30 years and decrease the cost of therapy because they can be used by the patient at home with minimal medical supervision. However, proper use of current MDIs requires training and precise execution of the delivery technique. For these reasons, many patients do not use their MDIs in the prescribed manner to coordinate actuation and inhalation. Incorrect technique has been shown to result in little or no benefits from MDI use in half of all adult patients and in a greater proportion of children. Moreover, because of these coordination issues, most children under age five cannot use a standard MDI.

Even with correct technique, current MDIs deliver less than 20% of the drug to the lungs of the patient. The remaining 80% of the drug is wasted upon deposition on the back of the mouth, or by completely missing the airway. This results from: (1) the high linear velocity (two to seven meters/second) of the aerosol jet as it discharges; (2) incomplete evaporation of the propellant leading to large size droplets that deposit in the mouth and larynx rather than reaching the lung; and (3) inadequate mixing resulting in a non-uniform distribution of drug particles in the inspiratory flow stream. Drug deposited in the mouth and throat can be swallowed and absorbed systemically or, in the case of inhaled steroids, may create a local concentration of the drug that causes immunosuppression response and the development of fungal infections. In addition, swallowing beta agonist bronchodilators causes relaxation of the smooth muscles of the gastrointestinal tract that decreases activity of the stomach.

From a therapeutic view, the most serious problem with MDIs is inconsistency of delivery. With existing MDIs the actual dose can vary from 0% to 300% of the intended dose. Patients may not receive sufficient drug to achieve a therapeutic effect, or they may overdose with undesirable side effects. These conditions can lead to the need for emergency treatment.

A major advantage for the ADDS technology is that it uses the

same aerosol canisters and valves as are currently used in existing MDIs. As a result, existing aerosol facilities will be able to produce canisters with formulations optimized for use in ADDS. The only additional step required is to place the aerosol canister in the "device" prior to final packaging. This results in a cost effective product and provides numerous benefits to patients. The device, like the canister, is disposable when the canister is empty.

The ADDS technology features two improvements over existing MDIs and dry powder inhalers. Fluid dynamics modeling and IN-VITRO trials indicate that up to 50% of drug emitted by the ADDS reaches the lungs with oral deposition reduced to less than 10%. Because of this increase in efficiency, ADDS should require less drug per actuation than existing devices to achieve a therapeutic effect. This will result in more unit doses per drug canister than a conventional MDI, with less potential for adverse reactions.

ADDS also features a unique proprietary triggering mechanism that actuates at the correct time during inhalation. It is designed to automatically adjust to the patient's breathing pattern to accommodate differences in age and disease state. This synchronous trigger is designed to reduce patient coordination problems and enhances patient compliance.

DESCRIPTION OF ADDS

The ADDS technology utilizes a standard aerosol MDI canister, encased in a compact device that provides an aerosol flow-control chamber and a synchronized triggering mechanism. Manipulation of the discharged drug-containing aerosol cloud is key to optimization of the efficiency and consistency for MDIs. The unique features of ADDS are:

AEROSOL FLOW-CONTROL CHAMBER. The ADDS design uses fluid dynamics to: (1) reduce the velocity of the drug relative to the inspiratory breath velocity (less than one meter/second); (2) increase residence time of the aerosol droplets before exiting the device to allow near complete evaporation of propellant; (3) increase droplet dispersion and mixing, thus increasing evaporation and improving vapor fraction at every point along the flow path; (4) reduce the diameter of the drug particles at the exit plane of the device; (5) decrease inertia of droplets to reduce impaction; and (6) optimize timing of dose discharge with inspiratory breath for maximum drug deposition in lungs.

SYNCHRONIZING TRIGGER MECHANISM. The aerosol flow-control chamber allows the patient to inhale through the device at a normal breathing rate, instead of a forced breath. The inspiratory breath establishes flow fields within the device that mix and uniformly disperse the drug in the breath. At the mouthpiece, nearly all the propellant is evaporated leaving only drug particles to be inspired, allowing a dramatic increase in the amount of drug delivered to the lungs. Only small amounts of drug deposit in the mouth and throat. A triggering and timing mechanism that is synchronized with the patient's inspiratory breath control the discharge of the

metering valve. ADDS can accommodate different flowrates, so any patient can activate the triggering device. Similarly, the timing mechanism will automatically adjust to the flow generated by the patient, delaying or hastening discharge in proportion to the total volume passing through the flow control chamber. This feature accommodates differences in inspiratory flow characteristic of pulmonary disease states in children, adults and the infirm.

ADDS ADVANTAGES

The performance characteristics of the ADDS are expected to translate into multiple benefits, including:

IMPROVED DRUG DELIVERY EFFICIENCY. The majority of the drug emitted by the ADDS is delivered to the lungs while less than 10% is lost through deposition in the mouth and throat. The improved delivery efficiency enhances efficacy, reduces side effects and provides greater consistency of dose administration.

GREATER PATIENT COMPLIANCE. The ADDS eliminates technique dependence for simple, consistent dose-to-dose delivery, resulting in improved compliance with prescribed therapy.

BROADER PATIENT BASE. The ADDS can be prescribed for a broader patient base since it is designed to be self-administered by children and the elderly as well as adult patients.

PHARMACOECONOMIC BENEFIT. The ADDS has increased delivery efficiency with less waste, so patients can receive more unit doses per standard canister. This allows for a lower drug cost per day in addition to reducing prescription and payor costs because fewer pharmacy visits are required.

ADDS PRODUCT PIPELINE IN DEVELOPMENT

The Company believes that the ADDS technology possesses many potential competitive advantage over other inhalation systems in both local respiratory and systemic applications. It is applicable to all age categories, eliminating the most troublesome problems of aerosol metered dose delivery. Increased efficiency allows for potential application to proteins and peptides formerly discarded as candidates for aerosol delivery.

The development of systemic drugs using ADDS is being conducted as part of the Company's alliance with Elan. A range of suitable compounds has been identified and the first product has begun the development process. Therapeutic areas of interest to the Company include:

ADDS MIGRAINE THERAPY. Migraine headaches affect 16-18 million Americans. Annual sales for the migraine therapy market are in excess of $1.3 billion with many patients unable to get satisfactory relief from currently available therapies. In

fact, it is estimated that absenteeism and medical expenses resulting from migraine total $50 billion annually. Current oral drug therapies for the treatment of migraine headaches have slow onset of action, resulting in a medical need that may be better satisfied through pulmonary delivery.

ADDS RESPIRATORY THERAPIES. The ADDS has broad applications across respiratory disease therapies since it utilizes basic MDI delivery methods that are the most popular forms of respiratory delivery. The ADDS technology's ability to vastly minimize oral deposition makes it especially applicable to steroids and steroid combinations with which fungal overgrowth side effects are common. In addition, U.S. patients and physicians have indicated that they prefer metered dose aerosol delivery. The ADDS technology is positioned to take advantage of this built-in market preference for MDIs with its potential for superior performance, reduced adverse reactions and cost-effectiveness. Inhaled steroids are the fastest growing segment of the respiratory market and the largest in Europe. The features of the ADDS directly minimize the aspects of inhaled steroids that remain a concern to patients and physicians. The market for inhaled steroids on a worldwide basis is approximately $1.5 billion.

As with MSI, there remains opportunities for developing ADDS for a range of therapies either directly by the Company or in collaboration with strategic partners. Unlike the MSI, it is potentially advantageous for the Company to partner on a product-by-product basis, concentrating on prime partners to launch the system commercially and to aid in subsequent development with products developed specifically for exclusive commercialization by the Company.

ULTRASONIC PULMONARY DRUG ABSORPTION SYSTEM

The Ultrasonic Pulmonary Drug Absorption System ("UPDAS(TM)") is a novel ultrasonic pulmonary delivery system designed by Elan as a disposable unit dose nebulizer system. UPDAS was designed primarily for the delivery of proteins, peptides and other large molecules to the lungs for absorption into the bloodstream. Elan's preliminary research with UPDAS demonstrated unique atomization that may prevent denaturing of bioactive molecules and particle size distribution that meets the targets for local and systemic delivery. The Company intends to initiate in-vitro validation testing of UPDAS to confirm Elan's preliminary results and to develop data to support patent filings. A plan for additional development of UPDAS will be prepared based upon the results of this confirmational testing.

ENHANCING TECHNOLOGY

As part of the same transaction in which the Company acquired UPDAS, the Company also acquired a worldwide exclusive license to Elan's Enhancing Technology. While not a delivery system itself, the Enhancing Technology is a therapeutic agent identified by Elan to increase the systemic absorption of drugs delivered to the lungs. The Enhancing Technology will be utilized in conjunction with the Company's other pulmonary delivery systems. The Company intends to complete the in-vitro testing necessary to substantiate the unique absorption properties of the Enhancing Technology that have been identified by Elan. After this work is completed and analyzed, the Company plans

to determine the appropriate patent strategy to take and to begin development of the Enhancing Technology for use in the Company's delivery systems.

EARLY STAGE RESEARCH PROJECTS

As part of the Company's focus on later stage opportunities, the Company is seeking to out-license its portfolio of early stage medical research projects to companies that are committed to early stage biotechnology opportunities. The Company has determined that its early stage technologies do not fit the Company's pulmonary drug delivery strategy. Consequently, the Company plans to out-license these technologies while maintaining an interest in the technologies' promise without incurring the development costs associated with early stage research and development.

Because the Company is no longer funding these projects, it may be at risk of losing its rights to certain of these technologies. There can be no assurance that the Company will be able to sell or license its rights to any of its remaining early stage research projects or realize any milestone payments or other revenue from those early stage research projects that have been previously divested.

ANTI-PROLIFERATIVE TECHNOLOGIES

The Company holds rights to certain compounds and their uses for the treatment of conditions characterized by unregulated cell proliferation or cell growth and sickle cell anemia. The Company's intellectual property portfolio consists of clotrimazole ("CLT"), its metabolites and a number of proprietary new chemical entities co-owned by the Company termed the Trifens(TM). Such compounds have demonstrated promise in therapeutic applications for treating a number of conditions characterized by unregulated cell proliferation, such as cancer (including multiple drug resistance cases) and certain proliferative dermatological conditions, as well as sickle cell anemia and secretory diarrhea.

The Company entered into a license arrangement with Lorus Therapeutics, Inc. (formerly Imutec Pharma Inc.) in November 1997. The arrangement licenses rights to a series of compounds for the treatment of cancer, Kaposi's sarcoma and actinic keratosis to a newly formed company, NuChem Pharmaceuticals, Inc. ("NuChem") for which Lorus Therapeutics will provide funding and management of the development program. The Company holds a 20% equity interest in NuChem.

Work on the lead compounds by NuChem has progressed in the pre-clinical phase. NuChem recently announced that the U.S. National Cancer Institute has agreed to undertake additional in vitro screening after initial evaluation of the compounds. The initial IND for the lead compounds is planned to be filed in early 2000.

The Company is actively seeking to partner or license the use of clotrimazole and the Trifens in the fields of sickle cell anemia and gastrointestinal disorders.

RBC-CD4 ELECTROINSERTION TECHNOLOGY

The Company is the worldwide licensee of certain technology (the "RBC-CD4 Electroinsertion Technology") relating to the electroinsertion of full-length CD4 protein into red blood cells for use as a potential therapeutic in the treatment of HIV that leads to AIDS. The Company has signed an option agreement with a private investment group that had a prior interest in the RBC-CD4 Electroinsertion Technology to sell the Company's rights to this HIV/AIDS technology. As consideration for the option, the third party will fund an additional study related to the RBC-CD4 Electroinsertion Technology. If this option is exercised, the Company will retain a one-third interest in all future commercial and sublicensing results.

LIPOSOME-CD4 TECHNOLOGY

The Company is the worldwide licensee of certain technology (the "Liposome-CD4 Technology") relating to the incorporation of CD4 antigens into liposome bilayers and their use as a potential therapeutic agent in the treatment of HIV/AIDS. The Company entered into a sublicense agreement in July 1996 with SEQUUS Pharmaceuticals, Inc. for the continued development and commercialization of the Liposome-CD4 Technology.

HIV/AIDS VACCINE

The Company holds an exclusive worldwide license to a potential HIV/AIDS vaccine and diagnostic test under development at the French Institute of Health and Medical Research. The Company is seeking a partner for this technology.

UGIF TECHNOLOGY - PROSTATE CANCER

The Company holds an exclusive worldwide license to a growth regulatory factor, termed Urogenital Sinus Derived Growth Inhibitory Factor ("UGIF"), which could serve as a potential prostate cancer therapy. Identification of UGIF as a growth inhibitory factor for certain prostate cells was based upon laboratory studies conducted at Baylor Medical College. The Company is seeking a partner for this technology.

GOVERNMENT REGULATION

The Company's research and development activities and, ultimately, the production and marketing of its licensed products, are subject to comprehensive regulation by numerous governmental authorities in the United States and other countries. Among the applicable regulations in the United States, pharmaceutical products are subject to the Federal Food, Drug & Cosmetic Act, the Public Health Services Act, other federal statutes and regulations, and certain state and local regulations. These regulations and statutes govern the development, testing, formulation, manufacture, labeling, storage, record keeping, quality control, advertising, promotion, sale, distribution and approval of such pharmaceutical products. Failure to comply with applicable requirements can result in fines, recall or seizure of products, total or partial suspension of production, refusal by the government to approve marketing of the product and criminal prosecution.

A new drug may not be legally marketed for commercial use in

the United States without FDA approval. In addition, upon approval, a drug may only be marketed for the indications, in the formulations and at the dosage levels approved by the FDA. The FDA also has the authority to withdraw approval of drugs in accordance with applicable laws and regulations. Analogous foreign regulators impose similar approval requirements relating to commercial marketing of a drug in their respective countries and may impose similar restrictions and limitations after approval.

In order to obtain FDA approval of a new product, the Company and its strategic partners must submit proof of safety, efficacy, purity and stability, and the Company must demonstrate validation of its manufacturing process. The testing and application process is expensive and time consuming, often taking several years to complete. There is no assurance that the FDA will act favorably or quickly in reviewing such applications. With respect to patented products, processes or technologies, delays imposed or caused by the governmental approval process may materially reduce the period during which the Company will have the exclusive right to exploit them. Such delays could also affect the commercial advantages derived from proprietary processes.

As part of the approval process, the FDA reviews the Drug Master File (the "DMF") for a description of product chemistry and characteristics, detailed operational procedures for product production, quality control, process and methods validation, and quality assurance. As process development continues to mature, updates and modifications of the DMF are submitted.

The FDA approval process for a pharmaceutical product includes review of (i) chemistry and formulations, (ii) preclinical laboratory and animal studies, (iii) initial IND clinical studies to define safety and dose parameters, (iv) well-controlled IND clinical trials to demonstrate product efficacy and safety, followed by submission and FDA approval of a New Drug Application (the "NDA"). Preclinical studies involve laboratory evaluation of the product and animal studies to assess activity and safety of the product. Products must be formulated in accordance with United States Good Manufacturing Procedures ("GMP") requirements and preclinical tests must be conducted by laboratories that comply with FDA regulations governing the testing of drugs in animals. The results of the preclinical tests are submitted to the FDA as part of the IND application and are reviewed by the FDA prior to granting the sponsor permission to conduct clinical studies in human subjects. Unless the FDA objects to an IND application, the application will become effective 30 days following its receipt by the FDA. There can be no certainty that submission of an IND will result in FDA authorization to commence clinical studies.

Human clinical trials are typically conducted in three sequential phases with some amount of overlap allowed. Phase I trials normally consist of testing the product in a small number of normal volunteers for establishing safety and pharmacokinetics using single and multiple dosing regiments. In Phase II, the continued safety and initial efficacy of the product are evaluated in a limited patient population, and appropriate dosage amounts and treatment intervals are determined. Phase III trials typically involve more definitive testing of the appropriate dose for safety and clinical efficacy in an expanded patient population at multiple clinical testing centers. A clinical plan, or "protocol," accompanied by the approval of the institution participating in the trials, must be submitted to the FDA prior to commencement of each clinical trial phase. Each clinical study must be conducted under the auspices of an Institutional Review Board (the "IRB") at the institution performing the clinical study. The IRB is charged with protecting the safety of

patients in trials and may require changes in a protocol, and there can be no assurance that an IRB will permit any given study to be initiated or completed. In addition, the FDA may order the temporary or permanent discontinuation of clinical trials at any time. The Company must rely on independent investigators and institutions to conduct these clinical studies.

All the results of the preclinical and clinical studies on a pharmaceutical product are submitted to the FDA in the form of an NDA for approval to commence commercial distribution. The information contained in the DMF is also incorporated into the NDA. Submission of an NDA does not assure FDA approval for marketing. The application review process often requires 12 months to complete. However, the process may take substantially longer if the FDA has questions or concerns about a product or studies regarding the product. In general, the FDA requires two adequate and controlled clinical studies demonstrating efficacy with sufficient levels of statistical assurance. However, additional support may be required. The FDA also may request additional information relating to safety or efficacy, such as long-term toxicity studies. In responding to an NDA, the FDA may grant marketing approval, require additional testing and/or information, or deny the application. Accordingly, there can be no assurance about any specific time frame for approval, if any, of products by the FDA or foreign regulatory agencies. Continued compliance with all FDA requirements and conditions relative to an approved application, including product specifications, manufacturing process, labeling and promotional material, and record keeping and reporting requirements, is necessary throughout the life of the product. In addition, failure to comply with FDA requirements, the occurrence of unanticipated adverse effects during commercial marketing or the result of future studies, could lead to the need for product recall or other FDA-initiated actions that could delay further marketing until the products or processes are brought into compliance.

The facilities of each pharmaceutical manufacturer must be registered with and approved by the FDA as compliant with GMP. Continued registration requires compliance with standards for GMP. In complying with GMP, manufacturers must continue to expend time, money and effort in production, record keeping and quality control to ensure technical compliance. In addition, manufacturers must comply with the United States Department of Health and Human Services and similar state and local regulatory authorities if they handle controlled substances, and they must be registered with the United States Environmental Protection Agency and similar state and local regulatory authorities if they generate toxic or dangerous waste streams. Other regulatory agencies such as the Occupational Safety and Health Administration also monitor a manufacturing facility for compliance. Each of these organizations conducts periodic establishment inspections to confirm continued compliance with its regulations. Failure to comply with any of these regulations could mean fines, interruption of production and even criminal prosecution.

For foreign markets, a pharmaceutical company is subject to regulatory requirements, review procedures and product approvals which, generally, may be as extensive, if not more extensive, as those in the United States. Although the technical descriptions of the clinical trials are different, the trials themselves are often substantially the same as those in the United States. Approval of a product by regulatory authorities of foreign countries must be obtained prior to commencing commercial product marketing in those countries, regardless of whether FDA approval has been obtained. The time

and cost required to obtain market approvals in foreign countries may be longer or shorter than required for FDA approval and may be subject to delay. There can be no assurance that regulatory authorities of foreign countries will grant approval. The Company has no experience in manufacturing or marketing in foreign countries nor in matters such as currency regulations, import-export controls or other trade laws.

PATENTS AND TRADEMARKS

MSI SYSTEM PATENTS AND TRADEMARK

Under its agreement with Siemens AG for the technology underlying the MSI system, the Company is responsible for jointly financing and prosecuting the U.S. patent applications for the benefit of the owners and licensors of this technology. To date, one U.S. patent has issued, two U.S. patent applications are pending, and three foreign patent applications are pending. In addition, the Company holds a trademark on "Premaire(TM)" as a brand name for the MSI system.

AEROSOL DRUG DELIVERY SYSTEM PATENTS

As a result of its acquisition of ADDS, the Company was assigned the rights to one U.S. patent application and three foreign patent applications that are pending on ADDS.

EARLY STAGE RESEARCH TECHNOLOGY PATENTS

Under its license agreements for its early stage research projects, the Company is responsible for financing and prosecuting patent applications for the benefit of the owners and licensors of these technologies. While the Company holds several U.S. and foreign patents and patent applications for these early stage technologies, the Company expects to assign these patents and applications to future acquirors, if any, of these technologies. Because the Company does not intend to continue to pay for future patent fees on these early stage technologies, in the event that no acquirors are found for these technologies, the Company expects that it will allow some or all of these patents and patent applications to lapse or the rights may be returned to the licensors.

COMPETITION

The Company competes with approximately 25 other companies involved in developing and selling respiratory products for the U.S. market. Most of these companies possess financial and marketing resources and developmental capabilities substantially greater than the Company. Some of the products in development by other companies may be demonstrated to be superior to the Company's current or future products. Furthermore, the pharmaceutical industry is characterized by rapid technological change and competitors may complete development and reach the market place prior to the Company. The Company believes that competition in the respiratory category will be based upon several factors, including product efficacy, safety, reliability, availability, and price, among others.

EMPLOYEES

As of March 19, 1999, the Company employed 12 persons, five of whom are executive officers.

CERTAIN RISK FACTORS THAT MAY AFFECT FUTURE RESULTS, FINANCIAL CONDITION AND MARKET PRICE OF SECURITIES

DEVELOPMENT STAGE COMPANY; HISTORY OF OPERATING LOSSES AND ACCUMULATED DEFICIT; GOING CONCERN OPINION

The Company is in the development stage. The Company has been principally engaged to date in research, development and licensing efforts, and has experienced significant operating losses. The Company experienced operating losses of $18,560,461 and $9,489,138 for the fiscal years ended December 31, 1998 and 1997 and, as of December 31, 1998, the Company had an accumulated deficit of $55,156,763. The independent auditors' report dated March 11, 1999, on the Company's consolidated financial statements stated that the Company has generated only minimal operating revenue, has incurred recurring operating losses and will require additional capital and that these conditions raise substantial doubt about its ability to continue as a going concern. The Company expects that it will continue to have a high level of operating expenses and will be required to make significant up-front expenditures in connection with its product development activities. As a result, the Company anticipates additional operating losses for 1999 and that such losses will continue thereafter until such time, if ever, as the Company is able to generate sufficient revenues to sustain its operations.

The Company's ability to achieve profitable operations is dependent in large part on regulatory approvals of its products. There can be no assurance that the Company will ever achieve such approvals or profitable operations.

SIGNIFICANT LIQUIDITY RESTRAINTS

The Company's cash available for funding its operations as of December 31, 1998 was $2,456,290. As of such date, the Company had trade payables of $615,138 and current research obligations of $449,805. In addition, committed and/or anticipated funding of research and development after December 31, 1998 is estimated at approximately $2,076,000. The Company will be required to obtain additional funds for its business through operations or equity or debt financings, collaborative arrangements with corporate partners or from other resources. No assurance can be given that these funds will be available for the Company to finance its development on acceptable terms, if at all. If adequate funds are not available from operations or additional sources of funding, the Company's business will suffer a material adverse effect.

NEED FOR ADDITIONAL FINANCING; UNCERTAINTY OF OBTAINING ADDITIONAL FUNDING

The Company's operations to date have consumed substantial and increasing amounts of cash. The negative cash flow from operations is expected to continue in the foreseeable future. The development of the Company's technologies and proposed products will require a commitment of substantial funds to conduct costly and time-consuming research, preclinical and clinical testing, and to bring any such products to market. The Company's future capital requirements will depend on many factors, including continued progress in out-licensing the early stage technology and developing the Company's pulmonary

delivery technologies, the ability of the Company to establish and maintain collaborative arrangements with others and to comply with the terms thereof, receipt of payments due from partners under research and development agreements, progress with preclinical and clinical trials, the time and costs involved in obtaining regulatory approvals, the cost involved in preparing, filing, prosecuting, maintaining and enforcing patent claims, the need to acquire licenses to new technology and the status of competitive products.

The Company needs to raise substantial additional capital to fund its operations. The Company intends to seek such additional funding through collaborative or partnering arrangements, the extension of existing arrangements, or through public or private equity or debt financings. There can be no assurance that additional financing will be available on acceptable terms or at all. If additional funds are raised by issuing equity securities, further dilution to shareholders may result. If adequate funds are not available, the Company may be required to delay, reduce the scope of, or eliminate one or more of its research or development programs or obtain funds through arrangements with collaborative partners or others that may require the Company to relinquish rights to certain of its technologies, product candidates or products that the Company would otherwise seek to develop or commercialize. If adequate funds are not available from operations or additional sources of funding, the Company's business will suffer a material adverse effect.

NO COMMERCIALIZATION OF PRODUCTS TO DATE

The Company has not yet begun to generate revenues from the sale of products. The Company's products will require significant additional development, clinical testing and investment prior to commercialization. The Company does not expect regulatory approval for commercial sales of any of its products in the immediate future. There can be no assurance that such products will be successfully developed, proven to be safe and efficacious in clinical trials, able to meet applicable regulatory standards, able to obtain required regulatory approvals, or produced in commercial quantities at reasonable costs or be successfully commercialized and marketed.

ROYALTY PAYMENT OBLIGATIONS

The owners and licensors of the technology rights acquired by the Company are entitled to receive a certain percentage of all royalties and payments in lieu of royalties received by the Company from commercialization, if any, of products in respect of which the Company holds licenses. Accordingly, in addition to its substantial investment in product development, the Company will be required to make substantial payments to others in connection with revenues derived from commercialization of products, if any, developed under licenses the Company holds. Consequently, the Company will not receive the full amount of any revenues that may be derived from commercialization of products to fund ongoing operations.

POTENTIAL LOSS OF RIGHTS UPON DEFAULT

Under the terms of existing agreements, the Company is obligated to make certain payments to its licensors. In the event that the Company defaults on the payment of an installment under the terms of an existing licensing agreement, its rights thereunder could be forfeited. As a consequence,

the Company could lose all rights under a license agreement to the related licensed technology, notwithstanding the total investment made through the date of the default. There can be no assurance that unforeseen obligations or contingencies will not deplete the Company's financial resources and, accordingly, sufficient resources may not be available to fulfill the Company's commitments.

RAPID TECHNOLOGICAL CHANGE; COMPETITION

The medical field is subject to rapid technological change and innovation. Pharmaceutical and biomedical research and product development are rapidly evolving fields in which developments are expected to continue at a rapid pace. Reports of progress and potential breakthroughs are occurring with increasing frequency. There can be no assurance that the Company will have a competitive advantage in its fields of technology or in any of the other fields in which the Company may concentrate its efforts.

The Company's success will depend upon its ability to develop and maintain a competitive position in the research, development and commercialization of products and technologies in its areas of focus. Competition from pharmaceutical, chemical, biomedical and medical companies, universities, research and other institutions is intense and is expected to increase. All, or substantially all, of these competitors have substantially greater research and development capabilities, experience, and manufacturing, marketing, financial and managerial resources. Further, acquisitions of competing companies by large pharmaceutical or other companies could enhance such competitors' financial, marketing and other capabilities. There can be no assurance that developments by others will not render the Company's products or technologies obsolete or not commercially viable or that the Company will be able to keep pace with technological developments.

GOVERNMENT REGULATION

The Company's ongoing research and development projects are subject to rigorous FDA approval procedures. The preclinical and clinical testing requirements to demonstrate safety and efficacy in each clinical indication (the specific condition intended to be treated) and regulatory approval processes of the FDA can take a number of years and will require the expenditure of substantial resources by the Company. Delays in obtaining FDA approval would adversely affect the marketing of products to which the Company has rights and the Company's ability to receive product revenues or royalties. Moreover, even if FDA approval is obtained, a marketed product, its manufacturer and its manufacturing facilities are subject to continual review and periodic inspections by the FDA, and a later discovery of previously unknown problems with a product, manufacturer or facility may result in restrictions on such product or manufacturer. Failure to comply with the applicable regulatory requirements can, among other things, result in fines, suspensions of regulatory approvals, product recalls, operating restrictions and criminal prosecution. Additional government regulation may be established which could prevent or delay regulatory approval of the Company's products. Sales of pharmaceutical products outside the United States are subject to foreign regulatory requirements that vary widely from country to country. Even if FDA approval has been obtained, approval of a product by comparable regulatory authorities of foreign countries must be obtained prior to the commencement of marketing the product in those countries. The time required to obtain such approval may be longer or shorter than that required for FDA approval. The Company has no experience in manufacturing or marketing in foreign countries nor in matters such as currency

regulations, import-export controls or other trade laws. To date, the Company has not received final regulatory approval from the FDA or any other comparable foreign regulatory authority in respect of any product or technology.

RISKS INCIDENT TO PATENT APPLICATIONS AND RIGHTS

The Company's success will depend in part on its ability to obtain patent protection for products and processes and to maintain trade secret protection and operate without infringing the proprietary rights of others. The degree of patent protection to be afforded to pharmaceutical, biomedical or medical inventions is an uncertain area of the law. There can be no assurance that the Company will develop or receive sublicenses or other rights related to proprietary technology which are patentable, that any patents pending will issue, or that any issued patents will provide the Company with any competitive advantages or will not be challenged by third parties. Furthermore, there can be no

assurance that others will not independently duplicate or develop similar products or technologies to those developed by or licensed to the Company. If the Company is required to defend against charges of patent infringement or to protect its own proprietary rights against third parties, substantial costs will be incurred and the Company could lose rights to certain products and technologies.

RELIANCE ON THIRD PARTIES; NO MARKETING OR MANUFACTURING CAPABILITIES

The Company does not currently have its own sales force or an agreement with another pharmaceutical company to market the Company's products that are in development. When appropriate, the Company will attempt to build or otherwise acquire the necessary marketing capabilities to promote its products. There can be no assurance that the Company will have the resources available to build or otherwise acquire its own marketing capabilities, or that agreements with other pharmaceutical companies can be reached to market the Company's products on terms acceptable to the Company.

In addition, the Company does not intend to manufacture its own products. While the Company has already entered into two manufacturing and supply agreements related to the MSI system, there can be no assurance that these manufacturing and supply agreements will be adequate or that the Company will be able to enter into future manufacturing and supply agreements on terms acceptable to the Company.

DEPENDENCE UPON OBTAINING HEALTHCARE REIMBURSEMENT

The Company's ability to commercialize human therapeutic and diagnostic products may indirectly depend in part on the extent to which costs for such products and technologies are reimbursed by private health insurance or government health programs. The uncertainty regarding reimbursement may be especially significant in the case of newly approved products. There can be no assurance that reimbursement price levels will be sufficient to provide a return to the Company on its investment in new products and technologies.

ADEQUACY OF PRODUCT LIABILITY INSURANCE

The use of the Company's proposed products and processes during testing, and after approval, may entail inherent risks of adverse effects which could expose the Company to product liability claims and associated adverse publicity. Although the Company currently maintains general liability insurance, there can be no assurance that the coverage limits of the Company's insurance policies will be adequate. The Company currently maintains clinical trial product liability insurance of $2.0 million per event for certain clinical trials and intends to obtain insurance for future clinical trials of products under development. There can be no assurance, however, that the Company will be able to obtain or maintain insurance for any future clinical trials. Such insurance is expensive, difficult to obtain and may not be available in the future on acceptable terms, or at all. A successful claim brought against the Company in excess of the Company's insurance coverage would have a material adverse effect upon the Company and its financial condition. The Company intends to require its licensees to obtain adequate product liability insurance. However, there can be no assurance that licensees will be able to maintain or obtain adequate product liability insurance on acceptable terms or that such insurance will provide adequate coverage against all potential claims.

POTENTIALLY LIMITED TRADING MARKET; POSSIBLE VOLATILITY OF STOCK PRICE.

The Common Stock is listed for trading on American Stock Exchange (the "AMEX") under the symbol "SHM". The Company does not presently satisfy the listing guidelines of the AMEX, including the AMEX guideline that a listed company that has sustained losses from operations and/or net losses in three of its four most recent fiscal years have stockholders' equity of at least $4,000,000. The Company has sustained net losses for its four most recent fiscal years and, at December 31, 1998, had stockholders' equity of $655,205. The failure to meet the AMEX listing guidelines may result in the Common Stock no longer being eligible for listing on the AMEX and trading, if any, of the Common Stock would thereafter be conducted in the over-the-counter market. If the Company's Common Stock were to be delisted from the AMEX, it may be more difficult for investors to dispose of, or to obtain accurate quotations as to the market value of, the Common Stock.

In the event of the delisting of the Company's Common Stock from the AMEX, the regulations of the Securities and Exchange Commission ("Commission") promulgated under the Securities Exchange Act of 1934, as amended ("Exchange Act"), require additional disclosure relating to the market for penny stocks. Commission regulations generally define a penny stock to be an equity security that has a market price of less than $5.00 per share, subject to certain exceptions. A disclosure schedule explaining the penny stock market and the risks associated therewith is required to be delivered to a purchaser and various sales practice requirements are imposed on broker-dealers who sell penny stocks to persons other than established customers and accredited investors (generally institutions). In addition, the broker-dealer must provide the customer with current bid and offer quotations for the penny stock, the compensation of the broker-dealer and its salesperson in the transaction and monthly account statements showing the market value of each penny stock held in the customer's account. If the Company's securities become subject to the regulations applicable to penny stocks (i.e., by AMEX delisting), the market liquidity for the Company's securities could be severely affected. In such an event, the regulations on penny stocks could limit the ability of broker-dealers to sell the Company's

securities and thus the ability of purchasers of the Company's securities to sell their securities in the secondary market. In the absence of an active trading market, holders of the Common Stock may experience substantial difficulty in selling their securities.

VOLATILITY OF MARKET PRICE OF SECURITIES

The market price of securities of firms in the biotechnology/pharmaceutical industries have tended to be volatile. Announcements of technological innovations by the Company or its competitors, developments concerning proprietary rights and concerns about safety and other factors may have a material effect on the Company's business or financial condition. The market price of the Common Stock may be significantly affected by announcements of developments in the medical field generally or the Company's research areas specifically. The stock market has experienced volatility in market prices of companies similar to the Company that has often been unrelated to the operating results of such companies. This volatility may have a material adverse effect on the market price of the Common Stock.

OUTSTANDING OPTIONS, WARRANTS AND CONVERTIBLE SECURITIES; DILUTION

As of December 31, 1998, the Company had reserved approximately 7,910,836 shares of its Common Stock for issuance upon exercise of outstanding options and warrants convertible into shares of its Common Stock, including shares of Common Stock issuable upon the exercise of options and warrants held by officers and directors of the Company. In addition, as of December 31, 1998, the Company had $1,000,000 principal amount of a Convertible Promissory Note and 11,914 shares of its Series C Cumulative Convertible Preferred Stock outstanding. Each of the convertible securities provide for conversion into shares of Common Stock of the Company at a discount to the market. The Series C Preferred Stock are convertible into 8,449,647 shares of Common Stock and the Convertible Promissory Note is convertible into 571,428 shares of Common Stock. The exercise of options and outstanding warrants, the conversion of such other securities and sales of Common Stock issuable thereunder could have a significant dilutive effect on the market price of shares of the Company's Common Stock and could materially impair the Company's ability to raise capital through the future sale of its equity securities.

AUTHORIZATION OF PREFERRED STOCK

The Company's Certificate of Incorporation authorizes the issuance of "blank check" preferred stock with such designations, rights and preferences as may be determined from time to time by the Board of Directors, without shareholder approval. In the event of issuance, such preferred stock could be utilized, under certain circumstances, as a method of discouraging, delaying or preventing a change in control of the Company and preventing shareholders from receiving a premium for their shares in connection with a change of control. The Company issued Series A and Series B Cumulative Convertible Redeemable Preferred Stock in connection with private placements in February 1997 and April 1998, respectively. All of the Series A Preferred Stock was converted into common stock during 1998. On July 31, 1998, all of the Series B Preferred Stock was redeemed for cash. The Company also issued shares of its Series C Cumulative Convertible Preferred Stock in connection with the

consummation of an agreement with Elan in June 1998. The Company has no present intention to issue any additional shares of its preferred stock (except for additional shares of its Series C Preferred Stock that are payable as dividends to Elan, as holder of the outstanding Series C Preferred Stock); however, there can be no assurance that the Company will not issue additional shares of its preferred stock in the future.

ITEM 2. PROPERTIES

The Company's principal executive offices are located at 425 South Woodsmill Road, St. Louis, Missouri 63017. These premises consist of approximately 4,521 square feet subject to a lease that expires September 14, 2002. The monthly rent for these premises is $9,042. The Company also maintains a research facility in Ann Arbor, Michigan, and leases a small office in Pittsford, New York. The Company maintains no other laboratory, research or other facilities, but primarily conducts research and development in outside laboratories under contracts with universities or research facilities. The Company believes that its existing office arrangements will be adequate to meet its reasonably foreseeable needs.

ITEM 3. LEGAL PROCEEDINGS

There are no material legal proceedings against the Company or any of its subsidiaries.

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

None.

PART II

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

The following table sets forth the high and low sale prices of the Company's Common Stock on the American Stock Exchange (the "AMEX") for the periods indicated.

1998:	HIGH	LOW
Fourth Quarter.....	$ 2.500	.938
Third Quarter.....	2.500	1.063
Second Quarter.....	2.313	.625
First Quarter.....	1.438	.625
1997:		
Fourth Quarter.....	$ 2.500	1.125
Third Quarter.....	3.000	2.000
Second Quarter.....	3.375	2.250
First Quarter.....	3.750	2.625

The closing sale price for the Company's Common Stock on the AMEX on March 19, 1999 was $2.25 per share. At March 19, 1999, there were approximately 427 holders of record of the Company's Common Stock.

The Company has never paid dividends on its Common Stock and does not intend to pay cash dividends on its Common Stock in the foreseeable future. The terms of the Company's Series C Cumulative Convertible Preferred Stock generally prohibit the payment of cash dividends and other distributions on the Company's Common Stock unless full cumulative stock dividends on shares of such Series C Preferred Stock have been paid or declared in full. During 1998, the Company issued stock dividends totaling 414 shares of Series C Preferred Stock and cash dividends for fractional shares of $1,112.

The following unregistered securities were issued by the Company during the quarter ended December 31, 1998:

Date Of Sale/Issuance	Description Of Securities Issued	Number Of Shares Sold/issued/ Subject To Options Or Warrants	Offering/ Exercise Price Per Share ($)	Purchaser Or Class
~~November 1998~~	~~Common Stock Options~~	~~120,000~~	~~$1.688 - $3.688~~	~~Employee~~

The issuance of these securities are claimed to be exempt from registration pursuant to Section 4(2) of the Securities Act of 1933, as amended, as transactions by an issuer not involving a public offering. There were no underwriting discounts or commissions paid in connection with the issuance of any of these securities.

ITEM 6. SELECTED FINANCIAL DATA

SELECTED FINANCIAL INFORMATION
(In dollars, except per share information)

The information in the following table should be read in conjunction with "Management's Discussion and Analysis of Financial Condition and Results of Operations" under Item 7 and the Company's Consolidated Financial Statements and related Notes under Item 8.

	Year-Ended December 31				
	1998	1997	1996	1995	1994
STATEMENT OF OPERATIONS DATA:					
Sublicense and interest income	$ 410,273	$ 556,914	$ 673,664	$ 80,610	$ 63,290
Operating costs and expenses:					
Research and development	15,676,301(a)	5,379,193(a)	3,841,818	4,424,154	3,989,838
General and administrative	3,294,433	4,666,859	3,840,735	3,044,173	2,393,082
Total operating costs and expenses	18,970,734	10,046,052	7,682,553	7,468,327	6,382,920
Loss from operations	$(18,560,461)	$ (9,489,138)	$ (7,008,889)	$ (7,387,717)	$ (6,319,630)
Loss per share of common stock - basic	$ (0.85)	$ (0.80)	$ (0.65)	$ (0.90)	$ (0.96)
Weighted average common shares outstanding	21,931,040	11,976,090	10,806,799	8,185,457	6,596,227
BALANCE SHEET DATA:					
Working capital (net deficiency)	1,456,833	$ (837,564)	$ 1,433,773	$ 1,585,675	$ (799,629)
Total assets	2,862,521	689,937	2,773,884	2,221,050	371,073
Long-term obligations & redeemable preferred stock	1,000,000	4,019,263	27,206	--	--
Accumulated deficit	(55,156,763)	(36,157,290)	(26,588,652)	(19,579,763)	(12,192,046)
Stockholders' equity (net capital deficiency)	655,205	(4,716,751)	1,695,837	1,792,363	(573,853)

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No cash dividends have been paid on common stock for any of the periods presented.

Loss per share is based upon the weighted average number of common and certain common equivalent shares outstanding.

See consolidated financial statements and accompanying footnotes.

(a) Includes $13,325,000 and $1,650,000 of acquired research and development in-process technology in 1998 and 1997, respectively.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OR PLAN OF OPERATION

THIS REPORT CONTAINS CERTAIN FORWARD-LOOKING STATEMENTS WITHIN

THE MEANING OF SECTION 27A OF THE SECURITIES ACT OF 1933, AS AMENDED, AND SECTION 21E OF THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED, WHICH ARE INTENDED TO BE COVERED BY THE SAFE HARBORS CREATED HEREBY. ALL FORWARD-LOOKING STATEMENTS INVOLVE RISKS AND UNCERTAINTY, INCLUDING WITHOUT LIMITATION, RISKS SET FORTH ABOVE UNDER "BUSINESS - CERTAIN RISK FACTORS THAT MAY AFFECT FUTURE RESULTS, FINANCIAL CONDITION AND MARKET PRICE OF SECURITIES."

THE DISCUSSION AND ANALYSIS BELOW SHOULD BE READ IN CONJUNCTION WITH THE FINANCIAL STATEMENTS OF THE COMPANY AND THE RELATED NOTES TO FINANCIAL STATEMENTS INCLUDED ELSEWHERE HEREIN.

OVERVIEW

Sheffield Medical Technologies Inc. ("Sheffield") was incorporated under Canadian law in October 1986. In May 1992, the Company became domesticated as a Wyoming corporation pursuant to a "continuance" procedure under Wyoming law. In January 1995, the Company's shareholders approved the proposal to reincorporate Sheffield in Delaware, which was effected on June 13, 1995. On January 10, 1996, Ion Pharmaceuticals, Inc. ("Ion"), was formed as a wholly owned subsidiary of the Company. At that time, Ion acquired the Company's rights to certain early stage biomedical technologies. On April 17, 1997, CP Pharmaceuticals, Inc. ("CP") was formed for the purpose of acquiring Camelot Pharmacal, L.L.C., a privately held pharmaceutical development company, which acquisition was consummated on April 25, 1997. In June 1997, the Company's shareholders approved the proposal to change Sheffield's name from Sheffield Medical Technologies Inc. to Sheffield Pharmaceuticals, Inc. As part of an agreement with Elan Corporation plc ("Elan"), on June 30, 1998, Systemic Pulmonary Delivery, Ltd. ("SPD") was formed as a wholly owned subsidiary of the Company. At that time, SPD acquired the Company's rights to the systemic applications of the MSI and acquired Elan's rights to certain pulmonary delivery technologies. Unless the context requires otherwise, Sheffield, Ion, CP and SPD are referred herein to as "the Company".

The Company is in the development stage and to date has been principally engaged in research, development and licensing efforts. The Company has generated minimal operating revenue and will require additional capital which the Company intends to obtain through out-licensing as well as through equity and debt offerings to continue to operate its business. The Company's ability to meet its obligations as they become due and to continue as a going concern must be considered in light of the expenses, difficulties and delays frequently encountered in developing a new business, particularly since the Company will focus on research, development and unproven technology that may require a lengthy period of time and substantial expenditures to complete. Even if the Company is able to successfully develop new products, there can be no assurance that the Company will generate sufficient revenues from the sale or licensing of such products to be profitable. Management believes that the Company's ability to meet its obligations as they become due and to continue as a going concern through December 1999 is dependent upon obtaining additional funding.

The accompanying consolidated financial statements have been prepared on a going concern basis which contemplates the realization of assets and satisfaction of liabilities and commitments in the normal course of business.

RESULTS OF OPERATIONS

REVENUE

Sublicense revenue of $350,000 and $500,000 for the years ended December 31, 1998 and 1997, respectively, relate to a sublicense agreement entered into during 1997 with Lorus Therapeutics, Inc. (formerly Imutec Pharma Inc.). The agreement licensed rights to a series of compounds for the treatment of cancer, Kaposi's sarcoma and actinic kerotosis to a newly formed company, NuChem Pharmaceuticals, Inc. ("NuChem") for which Lorus Therapeutics, Inc. will provide funding and management of the development program. The Company received $500,000 in cash upon signing the agreement in 1997 and received 583,188 shares of Lorus Therapeutics, Inc. stock with a value of $350,000 in 1998. The sublicense revenue of $510,000 in 1996 related to a sublicense agreement for the Company's Liposome - CD4 technology. Interest income was $60,273 for the year ended December 31, 1998 compared to $56,914 and $163,664 for the years ended December 31, 1997 and 1996, respectively. The decrease in 1997 interest income of $106,750 compared to 1996, was due primarily to the use of funds available for investment as a result of the acquisition of the MSI system from Siemens AG.

ACQUISITION OF RESEARCH & DEVELOPMENT IN-PROCESS TECHNOLOGY

Acquisition of research and development in-process technology for the years ended December 31, 1998, 1997 and 1996 was $13,325,000, $1,650,000 and $0, respectively. The decrease from 1997 to 1998 is attributable to the acquisition of the Aerosol Drug Delivery System ("ADDS") from Aeroquip-Vickers for $825,000 and the acquisition of certain pulmonary delivery technologies from Elan for $12,500,000. The 1997 amounts are attributable to the acquisition of Camelot Pharmacal, LLC. The acquisitions noted above were expensed in the year acquired since the technologies had not demonstrated technological feasibility and had no alternative future uses.

RESEARCH AND DEVELOPMENT

Research and development expenses were $2,351,301 for the year ended December 31, 1998 compared to $3,729,193 and $3,841,818 for the years ended December 31, 1997 and 1996, respectively. The decrease of $1,377,892 from 1997 to 1998 reflects both the Company's continued winding down of its early stage research projects and the shifting of responsibility for development expenses of the respiratory applications of the MSI to the Company's partner, Zambon Group SpA ("Zambon"). This decrease was partially offset by development costs associated with the ADDS technology acquired in July 1998. The 1997 decrease of $112,625 was attributable to the commencement of winding down of the Company's early stage technologies.

The Company entered into three R&D transactions in 1998. In June, the Company entered into an agreement with Zambon, whereby Zambon would receive an exclusive worldwide marketing and development sublicense for respiratory products to be delivered by the MSI system. Under this agreement, Zambon is responsible for the research and development costs associated with the respiratory applications of the MSI. In addition, SPD also acquired certain pulmonary delivery technologies from Elan. The Company is responsible for the development of these technologies. In addition, SPD acquired the ADDS technology from Aeroquip-Vickers. SPD holds the rights to all systemic applications of the ADDS technology, while Sheffield retains the rights to develop the respiratory disease applications. The Company is responsible for the research and

development costs of these systemic applications. Subject to certain conditions and the making of certain payments to the Company, Elan has the option to acquire all or a portion of the outstanding stock of SPD.

GENERAL AND ADMINISTRATIVE EXPENSES

General and administrative expenses were $3,043,070 for the year ending December 31, 1998 compared to $4,627,567 and $3,831,204 for the years ending December 31, 1997 and 1996, respectively. The decrease from 1997 to 1998 of $1,584,497 was due to lower compensation expense reflecting fewer employees during 1998 and the extension of certain option and warrant agreements in 1997. The 1998 decrease also reflects lower consulting costs resulting from expenses associated with two financings completed in 1997, and a loss realized on the sale of securities during 1997. The increase from 1996 to 1997 was due to an increased number of management salaries resulting from the Camelot acquisition, compensation expense associated with the extension of certain option and warrant agreements, and expenses related to the two financings completed during 1997.

INTEREST EXPENSE

Interest expense was $251,363 for the year ending December 31, 1998 compared with $39,292 and $9,531 for the years ending December 31, 1997 and 1996, respectively. The increase of $212,071 in 1998 as compared to 1997 was primarily due to interest paid on the Company's Series B Cumulative Convertible Preferred Stock and the Convertible Promissory Note issued to Elan. The increase from 1996 to 1997 of $29,761 was attributable to the Company's 6% Convertible Subordinated Debenture issued during 1997.

LIQUIDITY AND CAPITAL RESOURCES

Since its inception, the Company has financed its operations primarily through the sale of securities and convertible debentures, from which it has raised an aggregate of approximately $49 million through December 31, 1998.

On April 15, 1998, the Company issued 1,250 shares of its Series B Cumulative Convertible Redeemable Preferred Stock in a private placement for an aggregate purchase price of $1,250,000. The proceeds were used to make payment to Siemens A.G. pursuant to the MSI license agreement. During 1998, the Company entered into a sublicense agreement with Zambon that provided the Company $2,150,000 in gross proceeds from the sale of 2,646,153 shares of Common Stock. The Company also entered into an agreement with Elan that provided the Company approximately $17,500,000 of gross proceeds from the sale of 4,571,428 shares of Common Stock and 11,500 shares of the Company's Series C Cumulative Convertible Preferred Stock. The proceeds from the Elan transaction were used to purchase certain pulmonary device delivery technologies from Elan for $12,500,000, the ADDS for $825,000 from Aeroquip-Vickers, and to redeem $1,250,000 principal amount of Series B Preferred Stock. The remaining proceeds from the Elan transaction were used for research and development, working capital and general corporate purposes.

From inception through December 31, 1998, the Company earned $514,100 in interest on cash, cash equivalents and short-term investments. The

Company invests excess cash in cash equivalents and short-term investments in a cash management account that invests in U.S. government securities and high grade corporate investments.

Net cash used in development stage activities was $18,685,726 for the year ended December 31, 1998 compared with $6,677,405, $6,043,876, and $48,882,176 for the years ended December 31, 1997 and 1996, and from inception in 1986 through 1998, respectively. Cash of $20,900,000, $3,284,812, $6,420,834, and $48,855,005 was provided by the issuance of equity securities in 1998, 1997, 1996, and from inception in 1986 through 1998, respectively.

The Company's total assets were $2,862,521 at December 31, 1998 compared with $689,937 at December 31, 1997. The 1998 increase of $2,172,584 was primarily attributable to proceeds received from the agreement entered into with Elan. The Company's liabilities at December 31, 1998, consisting of accounts payable, sponsored research, capital lease obligations, a note payable and a convertible promissory note, were $2,207,316 compared with $2,938,425 at December 31, 1997.

The Company spent approximately $21,600,000 from inception through December 31, 1998 to fund certain ongoing technology research projects and expects to incur additional costs in the future, including costs relating to its ongoing research and development activities, and preclinical and clinical testing of its product candidates. The Company may also bear considerable costs in connection with filing, prosecuting, defending and/or enforcing its patent and other intellectual property claims. Therefore, the Company will need substantial additional capital before it will recognize significant cash flow from operations, which is contingent on the successful commercialization of the Company's technologies. There can be no assurance that any of the technologies to which the Company currently has or may acquire rights to can or will be commercialized or that any revenues generated from such commercialization will be sufficient to fund existing and future research and development activities.

The Company's direct research and development (R&D) expenses for its pulmonary delivery systems were $1,847,652 for the year ended December 31, 1998 and $3,792,500 from inception through December 31, 1998. The Company has committed to fund an additional $2,076,000 for these pulmonary delivery systems after December 31, 1998. The Company incurred $21,693 of R&D costs in 1998 associated with its early stage technologies, which includes RBC-CD4 Electroinsertion technology, Liposome-CD4 technology, HIV/AIDS vaccine, UGIF technology-prostate cancer, and anti-proliferative technologies. From inception to December 31, 1998, the Company incurred R&D expenses of $15,221,468 on these technologies. Since the Company is focused on development of its pulmonary delivery systems, it does not anticipate incurring additional research or development costs for these early stage projects.

Because the Company does not expect to generate significant cash flows from operations for at least the next few years, the Company believes it will require additional funds to meet future costs. The Company will attempt to meet its capital requirements with existing cash balances and through additional public or private offerings of its securities, debt financing, and collaboration and licensing arrangements with other companies. There can be no assurance that the Company will be able to obtain such additional funds or enter into such collaborative and licensing arrangements on terms favorable to the Company, if at all. The Company's development programs may be curtailed if future financings are not completed.

While the Company does not believe that inflation has had a material impact on its results of operations, there can be no assurance that inflation in the future will not impact financial markets which, in turn, may adversely affect the Company's valuation of its securities and, consequently, its ability to raise additional capital, either through equity or debt instruments, or any off-balance sheet refinancing arrangements, such as collaboration and licensing agreements with other companies.

YEAR 2000 COMPLIANCE

The inability of computers, software and other equipment utilizing microprocessors to recognize and properly process data fields containing a two digit year is commonly referred to as the Year 2000 compliance issue. Such systems that are not Year 2000 compliant may not be able to properly interpret dates beyond the Year 1999, which could lead to business disruptions in the U.S. and internationally. The potential costs and uncertainties associated with the Year 2000 issue will depend on a number of factors, including software, hardware and the nature of the industry in which a company operates. Additionally, companies must coordinate with other entities with which they electronically interact, such as customers, creditors and borrowers.

During 1998, the Company conducted an assessment of its computer systems to identify systems that could be affected by the Year 2000 issue. Substantially all software programs used by the Company have been determined to be Year 2000 compliant. In addition, the Company believes that with readily available upgrades to existing hardware, the Year 2000 issue will not pose significant operational problems for its computer system. The completion of hardware modifications to assure Year 2000 compliance is expected by the end of the second quarter of 1999.

The Company relies on various universities and laboratories for conducting a significant portion of the research and development of its products. The Company is currently in the process of communicating with the parties with which it does significant business to determine their Year 2000 compliance readiness and the extent to which the Company is vulnerable to any third party Year 2000 issues. The Company expects to complete its assessment of Year 2000 compliance of these third parties by July 1999. However, there can be no guarantee that the systems of other companies on which the Company relies will be timely converted or that a failure to convert by another company, or a conversion that is incompatible with the Company's systems, would not have material adverse effect on the Company.

The total cost to the Company of these Year 2000 compliance activities is estimated to be less than $25,000, and is not anticipated to be material to its financial position or results of operations. These costs and the date on which the Company plans to complete the Year 2000 modification and testing processes are based on management's best estimates, which were derived utilizing numerous assumptions of future events including the continued availability of certain resources, third party modification plans and other factors. However, there can be no assurance that these estimates will be achieved and actual results could differ from those plans.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURE ABOUT MARKET RISK

The Company has no material market risk exposure.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

See page F-1.

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

Not applicable.

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS, PROMOTERS AND CONTROL PERSONS; COMPLIANCE WITH SECTION 16(A) OF THE EXCHANGE ACT

DIRECTORS AND EXECUTIVE OFFICERS

The directors and executive officers of the Company and their positions with the Company are set forth below.

NAME	AGE	POSITION
Thomas M. Fitzgerald	48	Chairman and Director
Loren G. Peterson	42	President, Chief Executive Officer, and Director
John M. Bailey	51	Director
Digby W. Barrios	61	Director
Todd C. Davis	37	Director
George R. Griffiths	51	Director
David A. Byron	50	Executive Vice President - Scientific Affairs
Carl. F. Siekmann	55	Executive Vice President - Corporate Development
Scott A. Hoffmann	34	Vice President - Finance and Administration, Treasurer and Secretary, Chief Financial Officer

THOMAS M. FITZGERALD. Mr. Fitzgerald has been a Director of the Company since September 1996 and has served as Chairman of the Company since December 1997. From June 1996 to December 1997, Mr. Fitzgerald served as Chief Operating Officer of the Company and, from February 1997 to December 1997, he served as President of the Company. From 1989 to 1996 Mr. Fitzgerald was the Vice President and General Counsel of Fisons Corporation, an operating unit of Fisons Group plc, a U.K.-based ethical pharmaceutical company ("Fisons"). Mr. Fitzgerald was Assistant General Counsel of SmithKline Beecham prior to joining Fisons.

LOREN G. PETERSON. Mr. Peterson has been the Chief Executive Officer and a Director of the Company since April 1997. Mr. Peterson has served as President of the Company since December 1997. From January 1997 to April 1997, Mr. Peterson was a principal of Camelot Pharmacal, L.L.C., a privately held pharmaceutical development company he co-founded. From 1993 to 1996, Mr. Peterson served as Vice President - Finance and Chief Financial Officer of Bock Pharmacal Company, a privately held pharmaceutical company. From 1989 to 1993,

Mr. Peterson was a partner of the accounting firm of Coopers & Lybrand LLP.

JOHN M. BAILEY. Mr. Bailey has been a Director of the Company since April 1997. Mr. Bailey is the founder and majority shareholder of Bailey Associates, a consultancy specializing in providing companies with strategic advice and support through mergers, collaborations and divestments. From 1978 to 1996, Mr. Bailey was employed by Fisons, where he held a number of senior positions. In 1993, Mr. Bailey was appointed to the main board of Fisons and, in 1995, he was appointed Corporate Development Director of Fisons. In that role he was directly responsible for worldwide strategic and corporate development and for all merger, divestment, acquisition and business development activities of Fisons Group worldwide.

DIGBY W. BARRIOS. Mr. Barrios has been a Director of the Company since April 1997. Since 1992, Mr. Barrios has been a private consultant to the pharmaceutical industry. Mr. Barrios served from 1985 to 1987 as Executive Vice President, and from 1988 to 1992 as President and Chief Executive Officer, of Boehringer Ingelheim Corporation. Mr. Barrios is a member of the Board of Directors of Sepracor Inc., Roberts Pharmaceutical Corporation and Cypros Pharmaceutical Corporation.

TODD C. DAVIS. Mr. Davis has been a Director of the Company since September 1998. Since May 1997, Mr. Davis has served as Director of Investments and Corporate Development of Elan Pharmaceutical Research Corporation, an affiliate of Elan Corporation plc, an Irish pharmaceutical company. From September 1995 to May 1997, Mr. Davis was on educational leave from Abbott Laboratories, a pharmaceutical company, while receiving a Masters in Business Administration from Harvard University. From October 1993 to September 1995, Mr. Davis served as diagnostic systems product manager, and from October 1992 to September 1993 as product specialist of laboratory information systems of Abbott Laboratories.

GEORGE R. GRIFFITHS. Mr. Griffiths has been a Director of the Company since July 1998. Since June 1996, Mr. Griffiths has served as General Manager of Zambon Corporation, USA, the North American subsidiary of Zambon Group, SpA, a private Italian pharmaceutical company. From December 1995 to June 1996, Mr. Griffiths served as Senior Vice President for Pharmaceuticals of Zambon Corporation, USA and also from January 1996 to June 1996 he held the position of Vice President of Business Development. From July 1992 to January 1996, Mr. Griffiths served as Director of New Products/Specialty Products for Johnson & Johnson's Company's Janssen Pharmaceutica Division.

DAVID A. BYRON. Mr. Byron has been Executive Vice President - Scientific Affairs of the Company since April 1997. From January 1997 to April 1997, Mr. Byron was a principal of Camelot Pharmacal, L.L.C., a privately held pharmaceutical development company he co-founded. From 1994 to December 1996, Mr. Byron served as Vice President of Scientific Affairs of Bock Pharmacal Company, a privately held pharmaceutical company. From 1990 to 1994, Byron served as Senior Director - New Product Development of Sanofi-Winthrop Pharmaceutical Corporation.

CARL F. SIEKMANN. Mr. Siekmann has been Executive Vice President - Corporate Development of the Company since April 1997. From January 1997 to April 1997, Mr. Siekmann was a principal of Camelot Pharmacal, L.L.C., a

privately held pharmaceutical development company he co-founded. From 1992 to 1996, Mr. Siekmann served as Vice President of Business Development of Bock Pharmacal Company, a privately held pharmaceutical company.

SCOTT A. HOFFMANN. Mr. Hoffmann has been Chief Financial Officer and Vice President - Finance and Administration, Treasurer and Secretary of the Company since November 1998. From March 1995 to November 1998, Mr. Hoffmann was Assistant Controller of Zeigler Coal Holding Company, a coal mining company. From 1992 to 1995, Mr. Hoffmann was Vice President - Finance and Secretary of Zam's, Inc., a publicly-traded retailer.

MEETINGS AND COMMITTEES

The Board of Directors of the Company held five meetings during the fiscal year ended December 31, 1998. From time to time during such fiscal year, the members of the Board acted by unanimous written consent. The Company has standing Stock Option, Compensation, and Audit Committees. The Stock Option Committee reviews, analyzes and approves grants of stock options and stock to eligible persons under the Company's 1993 Stock Option Plan and the Company's 1993 Restricted Stock Plan. The current members of the Stock Option Committee (appointed in June 1997) are Digby W. Barrios and John M. Bailey. The Stock Option Committee held one meeting in 1998, and approved certain actions by written consent. The Compensation Committee reviews, analyses and makes recommendations to the Board of Directors regarding compensation of Company directors, employees, consultants and others, including grants of stock options (other than stock option grants under the Company's 1993 Stock Option Plan and the Company's Directors Plan). The current members of the Compensation Committee (appointed in June 1997) are Digby W. Barrios and John M. Bailey. The Compensation Committee held four meetings in 1998, and approved certain actions by written consent. The Audit Committee reviews, analyzes and makes recommendations to the Board of Directors with respect to the Company's compensation and accounting policies, controls and statements, and coordinates with the Company's independent public accountants. The current members of the Audit Committee (appointed in June 1997) are Loren G. Peterson, Digby W. Barrios and John M. Bailey. The Audit Committee held one formal meeting in 1998. The Company does not have a standing nominating committee or a committee which serves nominating functions.

ITEM 11. EXECUTIVE COMPENSATION

The following table sets forth, for the fiscal years indicated, all compensation awarded to, earned by or paid to the chief executive officer of the Company ("CEO") and the executive officers of the Company (other than the CEO) who were executive officers of the Company during the fiscal year ended December 31, 1998 and whose salary and bonus exceeded $100,000 with respect to the fiscal year ended December 31, 1998.

SUMMARY COMPENSATION TABLE

Name and Principal Position	Year	Annual Compensation Salary($)	Annual Compensation Bonus($)	Other Annual Compensation ($)(1)	Long-Term Compensation Awards Securities Underlying Options(#)
Thomas M. Fitzgerald, Chairman	1998	$175,000	$40,000	--	255,000
	1997	175,000	--	--	300,000
	1996	94,792	--	--	
Loren G. Peterson, President, Chief Executive Officer	1998	$175,000	--	--	155,000
	1997	118,655	--	--	400,000
David A. Byron, Executive Vice President, Scientific Affairs	1998	$160,000	--	--	105,000
	1997	108,485	--	--	400,000
Carl F. Siekmann, Executive Vice President, Corporate Development	1998	$160,000	--	--	105,000
	1997	108,485	--	--	400,000
Judy Roeske - Bullock, former Vice President, Finance & Administration, Chief Financial Officer(2)	1998	$149,808	--	--	
	1997	18,750	--	--	130,000

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(1) Perquisites and other personal benefits, securities or property delivered to each executive officer did not exceed the lesser of $50,000 or 10% of such executive's salary and bonus.

(2) Ms. Roeske-Bullock resigned from the Company effective November 15, 1998.

The following table sets forth certain information regarding stock option grants made to Messrs. Fitzgerald, Peterson, Byron, and Siekmann during the fiscal year ended December 31, 1998.

OPTION GRANTS IN LAST FISCAL YEAR

Individual Grants

Name	Options Granted (#)	% Of Total Options Granted To Employees In Fiscal Year	Exercise Or Base Price ($/Sh)	Expiration Date	Grant Date Present Value $ (1)
~~Thomas M. Fitzgerald, Chairman~~	~~255,000(2)~~	~~23.9%~~	~~$1.2375 - 3.125~~	~~August 28, 2008~~	~~$235,600~~
~~Loren G. Peterson, President, Chief Executive Officer~~	~~155,000(2)~~	~~14.6%~~	~~$1.2375 - 3.125~~	~~August 28, 2008~~	~~139,400~~
~~David A. Byron, Executive Vice President, Vice President, Scientific Affairs~~	~~105,000(2)~~	~~9.9%~~	~~$1.2375 - 3.125~~	~~August 28, 2008~~	~~94,150~~
~~Carl F. Siekmann, Executive Vice President, Corporate Development~~	~~105,000(2)~~	~~9.9%~~	~~$1.2375 - 3.125~~	~~August 28, 2008~~	~~94,150~~

(1) The present value of options at date of grant was estimated using the Black-Scholes model with the following assumptions: 1) expected life of 10 years; 2) risk-free interest rate of 4.9%; 3) volatility of 69.4%; and 4) dividend yield of 0%.

(2) These options were granted under a single option grant with exercise prices ranging from $1.2375 to $3.125.

The following table sets forth certain information regarding stock options held by Messrs. Fitzgerald, Peterson, Byron, and Siekmann, and Ms. Bullock as of December 31, 1998.

AGGREGATED OPTION EXERCISES
DURING THE MOST RECENTLY COMPLETED
FISCAL YEAR AND FISCAL YEAR-END OPTION VALUES

Name	Shares Acquired on Exercise(#)	Value Realized	No. of Securities Underlying Unexercised Options at FY-End (#) Exercisable/ Unexercisable	Value (1) of Unexercised in-the-Money Options at FY-End($) Exercisable/ Unexercisable
Thomas M. Fitzgerald, Chairman	--	--	150,000/405,000	--/$171,063
Loren G. Peterson, President and Chief Executive Officer	--	--	40,000/515,000	--/$75,063
David A. Byron, Executive Vice President, Scientific Affairs	--	--	40,000/465,000	--/$48,563
Carl F. Siekmann, Executive Vice President, Corporate Development	--	--	40,000/465,000	--/$48,563
Judy Roeske - Bullock, former Vice President, Finance & Administration, Chief Financial Officer	--	--	25,000/--	$9,375/--

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(1) Represents the total gain that would be realized if all in-the-money options held at December 31, 1998 were exercised, determined by multiplying the number of shares underlying the options by the difference between the per share option exercise price and the closing sale price of Common Stock of $2.375 per share reported on the American Stock Exchange for December 31, 1998. An option is in-the-money if the fair market value of the underlying shares exceeds the exercise price of the option.

BOARD OF DIRECTORS COMPENSATION

The Company does not currently compensate directors who are also executive officers of the Company or directors who are employees of the Company's alliance partners for their service on the Board of Directors. Under current Company policy, each non-employee Director of the Company receives a fee of $750 for each Board meeting attended and $400 for each Board committee meeting attended. Directors are reimbursed for their expenses incurred in attending meetings of the Board of Directors.

LONG-TERM INCENTIVE AND PENSION PLANS

During the year ended December 31, 1996, the Company adopted a defined contribution 401(k) plan in accordance with the Internal Revenue Code. Employees are eligible to participate in the 401(k) plan upon completion of three months of service provided they are over 21 years of age. Participants may defer up to 15% of eligible compensation. Currently, the Company does not provide matching contributions under the 401(k) Plan.

OTHER

No director or executive officer is involved in any material legal proceeding in which he is a party adverse to the Company or has a material interest adverse to the Company.

EMPLOYMENT AGREEMENTS

In June 1996, the Company entered into a three-year employment agreement with Thomas M. Fitzgerald pursuant to which Mr. Fitzgerald agreed to serve as Chief Operating Officer of the Company. The employment agreement requires Mr. Fitzgerald to devote his full business and professional time in furtherance of the business of the Company. Such agreement automatically renews for successive one-year terms unless one party provides written notice to the other of his or its intent to terminate at least six months prior to the end of the then current term. If Mr. Fitzgerald's employment is terminated other than for cause, he is entitled to receive a severance payment of $87,500, payable in six equal monthly installments. The agreement contains non-compete and confidentiality provisions. Mr. Fitzgerald's annual base salary under the agreement is currently $175,000.

In April 1997, the Company entered into a five-year employment agreement with Loren G. Peterson pursuant to which Mr. Peterson agreed to serve as Chief Executive Officer of the Company. The term of the agreement is automatically extended for an additional one year term from year to year unless one party notifies the other of its intention to terminate at least six months prior to the end of the then current term. The employment agreement requires Mr. Peterson to devote his full business and professional time in furtherance of the business of the Company. If Mr. Peterson's employment is terminated other than for cause, he is entitled to receive a severance payment of $131,250, payable in nine equal monthly installments. The employment agreement includes confidentiality and non-compete provisions. Mr. Peterson's annual base salary under the employment agreement is currently $175,000.

In April 1997, the Company entered into a five-year employment agreement with David A. Byron pursuant to which Mr. Byron agreed to serve as Executive Vice President - Scientific Affairs of the Company. The term of the agreement is automatically extended for an additional one year term from year to year unless one party notifies the other of its intention to terminate at least six months prior to the end of the then current term. The employment agreement requires Mr. Byron to devote his full business and professional time in furtherance of the business of the Company. If Mr. Byron's employment is terminated other than for cause, he is entitled to receive a severance payment of $120,000, payable in nine equal monthly installments. The employment agreement includes confidentiality and non-compete provisions. The employment agreement includes confidentiality and non-compete provisions. Mr. Byron's annual base salary under the employment agreement is currently $160,000.

In April 1997, the Company entered into a five-year employment agreement with Carl F. Siekmann pursuant to which Mr. Siekmann agreed to serve as Executive Vice President - Corporate Development of the Company. The term of the agreement is automatically extended for an additional one year term from

year to year unless one party notifies the other of its intention to terminate at least six months prior to the end of the then current term. The employment agreement requires Mr. Siekmann to devote his full business and professional time in furtherance of the business of the Company. If Mr. Siekmann's employment is terminated other than for cause, he is entitled to receive a severance payment of $120,000, payable in nine equal monthly installments. The employment agreement includes confidentiality and non-compete provisions. Mr. Siekmann's annual base salary under the employment agreement is currently $160,000.

COMPLIANCE WITH SECTION 16(A) OF THE SECURITIES EXCHANGE ACT OF 1934

Section 16(a) of the Securities Exchange Act of 1934, as amended, requires the Company's officers and directors, and persons who own more than ten percent of a registered class of the Company's equity securities, to file reports of ownership and changes in ownership with the Securities and Exchange Commission (the "Commission"). Officers, directors and greater than ten percent shareholders are required by the Commission's regulations to furnish the Company with copies of all Section 16(a) forms they file. To the Company's knowledge, all Section 16(a) forms that were required to be filed during the fiscal year ended December 31, 1998 were filed in compliance with the applicable requirements of Section 16(a) except as follows: Form 3's were filed late for each of Todd C. Davis and George R. Griffiths.

COMPENSATION COMMITTEE INTERLOCKS AND INSIDER PARTICIPATION

The compensation of the Company's senior management is determined by a Compensation Committee, presently consisting of, Digby W. Barrios and John M. Bailey. None of the members of the Compensation Committee is an executive officer of the Company.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The voting securities of the Company outstanding on March 19, 1999 consisted of 27,083,419 shares of Common Stock. The following table sets forth information concerning ownership of the Company's Common Stock, as at March 19, 1999, by (i) each director, (ii) each executive officer, (iii) all directors and executive officers as a group, and (iv) each person who, to the knowledge of management, owned beneficially more than 5% of the Common Stock.

Beneficial Owner(1)	Shares Beneficially Owned(2)	Percent Of Outstanding Common Stock(2)
Elan International Services, Ltd.....	14,868,216(3)	39.8%
Inpharzam International S.A.....	2,646,153(4)	9.8%
Thomas M. Fitzgerald.....	166,597(5)	*
Loren G. Peterson.....	301,000(6)	1.1%
David A. Byron.....	285,500(7)	1.1%
Carl F. Siekmann.....	287,000(8)	1.1%
John M. Bailey.....	100,000(9)	*
Digby W. Barrios.....	45,000(10)	*
George R. Griffiths.....	2,646,153(11)	9.8%

Todd C. Davis.....	14,893,216(12)	39.9%
All Directors and Executive Officers as a Group.....	18,724,466	49.4%

- ----------

* Less than 1%.

(1) The persons named in the table, to the Company's knowledge, have sole voting and investment power with respect to all shares shown as beneficially owned by them, subject to community property laws where applicable and the information contained in the footnotes hereunder.

(2) Calculations assume that all options and warrants held by each director, director nominee and executive officer and exercisable within 60 days after March 19, 1999 have been exercised.

(3) Based solely upon the Company's internal records of issuances of Common Stock and convertible securities to Elan International Services, Ltd. Includes 10,296,788 shares of Common Stock issuable upon exercise of warrants and conversion of Series C Cumulative Convertible Preferred Stock and Convertible Promissory Note. The address of Elan International Services, Ltd. is 102 St. James Court, Flatts, Smiths Parish FLO4, Bermuda

(4) Based solely upon information in the Schedule 13D of Inpharzam International S.A. dated June 15, 1998 filed with the Securities and Exchange Commission. The address of Inpharzam International S.A. set forth in such Schedule 13D is Via Industria 1, 6814 Cadempino, Switzerland.

(5) Includes 150,000 shares of common stock issuable upon exercise of options exercisable within 60 days after March 19, 1999. Mr. Fitzgerald's address is c/o Sheffield Pharmaceuticals, Inc., 425 South Woodsmill Road, St. Louis, Missouri 63017.

(6) Includes 80,000 shares of Common Stock issuable upon exercise of options exercisable within 60 days after March 19, 1999. 4000 of these shares are held by Mr. Peterson as custodian for the benefit of his children. Mr. Peterson disclaims beneficial ownership of such shares. Mr. Peterson's address is c/o Sheffield Pharmaceuticals, Inc., 425 South Woodsmill Road, Suite 270, St. Louis, Missouri 63017.

(7) Includes 80,000 shares of Common Stock issuable upon exercise of options exercisable within 60 days after March 19, 1999. Mr. Byron's address is c/o Sheffield Pharmaceuticals, Inc., 425 South Woodsmill Road, Suite 270, St. Louis, Missouri 63017.

(8) Includes 80,000 shares of Common Stock issuable upon exercise of options exercisable within 60 days after March 19, 1999. Mr. Siekmann's address is c/o Sheffield Pharmaceuticals, Inc., 425 South Woodsmill Road, Suite 270, St. Louis, Missouri 63017.

(9) Includes 100,000 shares of Common Stock issuable upon exercise of options exercisable within 60 days after March 19, 1999. Mr. Bailey's address is c/o Sheffield Pharmaceuticals, Inc., 425 South Woodsmill Road, St. Louis, Missouri 63017.

(10) Includes 40,000 shares of Common Stock issuable upon exercise of options exercisable within 60 days after March 19, 1999. Mr. Barrios' address is c/o Sheffield Pharmaceuticals, Inc., 425 South Woodsmill Road, St. Louis, Missouri 63017.

(11) Includes 2,646,153 shares held by Inpharzam International S.A. Mr.

Griffiths, an officer of Zambon Corporation, an affiliate of Inpharzam International S.A., disclaims any beneficial ownership interest in such shares. Mr. Griffths address is c/o Zambon Corporation, One Meadowland Plaza, East Rutherford, New Jersey 07073.

(12) Includes 25,000 of Common Stock issuable upon exercise of options exercisable within 60 days after March 19, 1999. Also includes 4,571,428 shares held by Elan International Services, Ltd. and 10,011,075 shares of Common Stock issuable upon exercise of warrants and conversion of Series C Cumulative Convertible Preferred Stock and Convertible Promissory Note. Mr. Davis, an employee of Elan Pharmaceutical Research Corporation, an affiliate of Elan International Services Ltd., a Bermuda corporation, disclaims any beneficial ownership interest in such shares. Mr. Davis' address is c/o Elan Pharmaceuticals Research Corp., 1300 Gould Drive, Gainesville, GA 30504.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS

In April 1997, the Company entered into a consulting agreement with John M. Bailey, a director of the Company, pursuant to which Mr. Bailey agreed to provide certain business and financial consulting advise to the Company. Mr. Bailey is paid a monthly retainer of 2,000 British Pounds Sterling under such agreement, which monthly retainer is reduced to 1,500 British Pounds Sterling for any month during which a Board of Directors meeting is held.

In December 1997, the Company entered into a severance agreement with Douglas R. Eger, a former Director and executive officer of the Company, pursuant to which Mr. Eger resigned as an employee of the Company. The severance agreement provided, among other things, for the principal amount of an $80,000 loan by the Company to Mr. Eger (the "Eger Loan") to be paid in six equal quarterly installments commencing on September 30, 1998, with all remaining principal and interest being paid in full on December 31, 1999, a severance payment of $135,000 payable in six equal installments of $22,500 each, with $2,500 of each such installment being applied to repay Mr. Eger's obligations under the Eger Loan, and the grant by Mr. Eger of a security interest in 30,000 shares of the Company's common stock to secure his obligations under the Eger Loan. During 1998, $15,000 of principal payments were applied to the Eger Loan. Pursuant to the Eger severence agreement, the Company was required to forgive the unpaid balance of $65,000 during 1998 when the Company was unable to make timely severance payments to Mr. Eger.

In February 1998, the Company entered into an agreement (the "Engagement Agreement") with an unaffiliated individual pursuant to which such individual was retained by the Company to facilitate an alliance with Zambon. Pursuant to the Engagement Agreement, the Company agreed to pay such individual a fee of between 2.5% and 4.0% of any equity investment or other financing received from Zambon. The Company also agreed to issue such individual warrants to purchase 150,000 shares of the Company's common stock at 125% of market price for a financing of $7.5 million or greater, with such warrants to be prorated proportionally on financing of a lesser amount. The Engagement Agreement also required the Company pay such individual a fee of 5.0% of amounts actually received by the Company from Zambon attributable to marketing or other rights to the Company's MSI system (net of any third party royalty obligations). Douglas R. Eger, a former officer and director of the Company, advised the Company that he was entitled to receive a portion of the fees payable by the Company to the individual who is the Company's counterparty to the Engagement Agreement. In

June 1998, the Company formed a strategic alliance with Zambon for the worldwide development and commercialization of drugs to treat respiratory disease in the Company's MSI system. In connection with the Zambon transaction and pursuant to the Engagement Agreement, the Company paid its counterparty to the Engagement Agreement $86,000.

During the period January 1, 1998 through April 30, 1998 certain executive officers provided funds for use by the Company in excess of $60,000 in the aggregate. These funds were comprised of short-term notes having a 7% annual interest rate, unpaid salaries and unreimbursed expenses. The largest aggregate amounts due to certain executives during this period are as follows: Loren G. Peterson, $85,923; David A. Byron, $80,343; and Carl F. Siekmann, $75,474. As of December 31, 1998 all outstanding balances of these short-term notes and the unreimbursed expenses had been paid in full.

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

(a)(1) Financial Statements

The following Financial Statements are included:
Report of Independent Auditors
Consolidated Balance Sheets as of December 31, 1998 and 1997
Consolidated Statements of Operations for the years ended December 31, 1998, 1997 and 1996 and for the period October 17, 1986 (inception) to December, 31 1998
Consolidated Statements of Stockholders' Equity (net capital deficiency) for the period from October 17, 1986 (inception) to December 31, 1998
Consolidated Statements of Cash Flows for the years ended December 31, 1998, 1997 and 1996 and for the period from October 17, 1986 (inception) to December 31, 1998
Notes to Financial Statements

(a)(2) Financial Statement Schedules

All financial statement schedules are omitted because they are not applicable, or not required, or because the required information is included in the financial statements or notes thereto.

(a)(3) Exhibits:

NO.	REFERENCE
3.1 Certificate of Incorporation of the Company, as amended	(10)
3.2 By-Laws of the Company	(4)

4.1 Form of Common Stock Certificate (2)

4.2 Certificate of Designation defining the powers, designations, rights, preferences, limitations and restrictions applicable to the Company's Series A Cumulative Convertible Redeemable Preferred Stock (7)

4.3 Certificate of Designations defining the powers, designations, rights, preferences, limitations and restrictions applicable to the Company's Series B Cumulative Convertible Redeemable Preferred Stock (11)

4.4 Certificate of Designations defining the powers, designations, rights, preferences, limitations and restrictions applicable to the Company's Series C Cumulative Convertible Redeemable Preferred Stock (10)

10.6 Employment Agreement dated as of June 6, 1996 between the Company and Thomas M. Fitzgerald (3)

10.6.5 Employment Agreement dated as of November 16, 1998 between the Company and Scott Hoffmann (1)

10.6.6 Employment Agreement dated as of November 17, 1997 between the Company and Judy Roeske-Bullock (14)

10.7 Agreement of Sublease dated as of November 17, 1995 between the Company and Brumbaugh Graves Donohue & Raymond relating to 30 Rockefeller Plaza, Suite 4515, New York, New York (2)

10.8 1993 Stock Option Plan, as amended (1)

10.9 1993 Restricted Stock Plan, as amended (2)

10.10 1996 Directors Stock Option Plan (7)

10.11 Agreement and Plan of Merger among the Company, Camelot Pharmacal, L.L.C., David A. Byron, Loren G. Peterson and Carl Siekmann dated April 25, 1997 (6)

10.12 Employment Agreement dated as of April 25, 1997 between the Company and David A. Byron (6)

10.13 Employment Agreement dated as of April 25, 1997 between the Company and Loren G. Peterson (6)

10.14 Employment Agreement dated as of April 25, 1997 between the Company and Carl Siekmann (6)

10.15 Form of the Company's 6% Convertible Subordinated Debentures due September 22, 2000. (8)

10.16 Lease dated August 18, 1997 between Corporate Center, L.L.C. and the Company relating to the lease of office space in St. Louis, Missouri. (5)

10.17 Assignment and License Agreement dated as of December 3, 1997 between 1266417 Ontario Limited and Ion Pharmaceuticals, Inc. (portions of this exhibit were omitted and were filed separately with the Securities Exchange Commission pursuant to the Company's application requesting confidential treatment in accordance with Rule 24b-2 as promulgated under the Securities Exchange Act of 1934, as amended). (9)

10.18 Sub-License Agreement dated as of December 3, 1997 between 1266417 Ontario Limited and Ion Pharmaceuticals, Inc. (portions of this exhibit were omitted and were filed separately with the Securities Exchange Commission pursuant to the Company's application requesting confidential treatment in accordance with Rule 24b-2 as promulgated under the Securities Exchange Act of 1934, as amended). (9)

10.19 Form of Sublicense and Development Agreement between Sheffield Pharmaceuticals, Inc. and Inpharzam International, S.A. (portions of this exhibit were omitted and were filed separately with the Securities and Exchange Commission pursuant to the Company's application requesting confidential treatment in accordance with Rule 24b-2 as promulgated under the Securities Exchange Act of 1934, as amended). (12)

10.20 Securities Purchase Agreement, dated as of June 30, 1998, by and between Sheffield pharmaceuticals, Inc. and Elan International Services, Ltd., which includes the Certificate of Designations of Series C Convertible Preferred Stock as Exhibit B. The Company agreed to furnish the disclosure schedules as well as Exhibits A and C, which were omitted from this filing, to the Commission upon request (portions of this exhibit were omitted and were filed separately with the Securities and Exchange Commission pursuant to the Company's application requesting confidential treatment in accordance with Rule 24b-2 as promulgated under the Securities Exchange Act of 1934, as amended). (13)

10.21 Systemic Pulmonary Delivery, Ltd. Joint Development and Operating Agreement dated as of June 30, 1998 among Systemic Pulmonary Delivery, Ltd., Sheffield Pharmaceuticals, Inc. and Elan International Services, Ltd. (portions of this exhibit were

	omitted and were filed separately with the Securities and Exchange Commission pursuant to the Company's application requesting confidential treatment in accordance with Rule 24b-2 as promulgated under the Securities Exchange Act of 1934, as amended).	(13)
10.22	License and Development Agreement dated June 30, 1998 between Sheffield Pharmaceuticals, Inc. and Systemic Pulmonary Delivery, Ltd. and Elan Corporation plc. (portions of this exhibit were omitted and were filed separately with the Securities and Exchange Commission pursuant to the Company's application requesting confidential treatment in accordance with Rule 24b-2 as promulgated under the Securities Exchange Act of 1934, as amended).	(13)
10.23	License and Development Agreement dated June 30, 1998 between Systemic Pulmonary Delivery, Ltd. and Sheffield Pharmaceuticals, Inc. and Elan Corporation, plc. (portions of this exhibit were omitted and were filed separately with the Securities and Exchange Commission pursuant to the Company's application requesting Rule 24b-2 as promulgated under the Securities Exchange Act of 1934, as amended).	(13)
10.24	License and Development Agreement dated June 30, 1998 between Elan Corporation, plc and Systemic Pulmonary Delivery, Ltd. and Sheffield Pharmaceuticals, Inc. (portions of this exhibit were omitted and were filed separately with the Securities and Exchange Commission pursuant to the Company's application requesting confidential treatment in accordance with Rule 24b-2 as promulgated under the Securities Exchange Act of 1934, as amended).	(13)
21	Subsidiaries of Registrant	(1)
23.1	Consent of Ernst & Young LLP	(1)
27	Financial Data Schedule	(1)

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(1) Filed herewith.

(2) Incorporated by reference to the Company's Annual Report on Form 10-KSB for its fiscal year ended December 31, 1995 filed with the Securities and Exchange Commission.

(3) Incorporated by reference to the Company's Quarterly Report on Form 10-QSB for the quarter ended June 30, 1996 filed with the Securities and Exchange Commission.

(4) Incorporated by reference to the Company's Quarterly Report on Form

10-Q for the quarter ended June 30, 1997 filed with the Securities and Exchange Commission.

(5) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 1997 filed with the Securities and Exchange Commission.

(6) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 1997 filed with the Securities and Exchange Commission.

(7) Incorporated by reference to the Company's Annual Report on Form 10-KSB for the year ended December 31, 1996 filed with the Securities and Exchange Commission.

(8) Incorporated by reference to the Company's Registration Statement on Form S-3 (File No. 333-38327) filed with the Securities and Exchange Commission on October 21, 1997.

(9) Incorporated by reference to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on December 17, 1997.

(10) Incorporated by reference to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 1998 filed with the Securities and Exchange Commission.

(11) Incorporated by reference to Exhibit 3 of the Company's Current Report on Form 8-K, dated April 17, 1998, filed with the Securities and Exchange Commission.

(12) Incorporated by reference to Exhibit 2 of the Company's Current Report on Form 8-K, dated June 22, 1998, filed with the Securities and Exchange Commission.

(13) Incorporated by reference to exhibits to the Company's Current Report on Form 8-K, dated July 16, 1998, filed with the Securities and Exchange Commission.

(14) Incorporated by reference to the Company's Annual Report on Form 10-K for the year ended December 31, 1997 filed with the Securities and Exchange Commission.

(b) Reports on Form 8-K

None

SIGNATURES

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

SHEFFIELD PHARMACEUTICALS, INC.

Dated: March 23, 1999 /S/ Loren G. Peterson

Loren G. Peterson
President and Chief Executive Officer

POWER OF ATTORNEY

Sheffield Pharmaceuticals, Inc. and each of the undersigned do

hereby appoint Loren G. Peterson and Thomas Fitzgerald and each of them severally, its or his or her true and lawful attorney to execute on behalf of Sheffield Pharmaceuticals, Inc. and the undersigned any and all amendments to this Annual Report and to file the same with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission; each of such attorneys shall have the power to act hereunder with or without the other.

In accordance with the Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant in the capacities and on the dates indicated.

Signature	Title	Date
/S/ Thomas M. Fitzgerald - ---------- Thomas M. Fitzgerald	Chairman and Director	March 23, 1999
/S/ Loren G. Peterson - ---------- Loren G. Peterson	Director, President and Chief Executive Officer	March 23, 1999
/S/ John M. Bailey - ---------- John M. Bailey	Director	March 23, 1999
/S/ Digby W. Barrios - ---------- Digby W. Barrios	Director	March 23, 1999
/S/ Todd C. Davis - ---------- Todd C. Davis	Director	March 23, 1999
/S/ George R. Griffiths - ---------- George R. Griffiths	Director	March 23, 1999
/S/ Scott A. Hoffmann - ---------- Scott A. Hoffmann	Vice President, Chief Financial Officer, Treasurer and Secretary (Chief Financial and Chief Accounting Officer)	March 23, 1999

SHEFFIELD PHARMACEUTICALS, INC. AND SUBSIDIARIES
(a development stage enterprise)

CONSOLIDATED FINANCIAL STATEMENTS

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Report of Independent Auditors

The Board of Directors and Stockholders
Sheffield Pharmaceuticals, Inc.

We have audited the accompanying consolidated balance sheets of Sheffield Pharmaceuticals, Inc. and subsidiaries (a development stage enterprise) as of December 31, 1998 and 1997, and the related consolidated statements of operations, stockholders' equity (net capital deficiency), and cash flows for each of the three years in the period ended December 31, 1998 and for the period October 17, 1986 (inception) through December 31, 1998. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

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

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Sheffield Pharmaceuticals, Inc. and subsidiaries at December 31, 1998 and 1997, and the consolidated results of their operations and their cash flows for each of the three years in the period ended December 31, 1998 and the period from October 17, 1986 (inception) through December 31, 1998, in conformity with generally accepted accounting principles.

The accompanying consolidated financial statements have been prepared assuming that Sheffield Pharmaceuticals, Inc. and subsidiaries will continue as a going concern. As more fully described in Note 1, the Company has generated only minimal operating revenue, has incurred recurring operating losses and will require additional capital. These conditions raise substantial doubt about the Company's ability to continue as a going concern. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

/s/ Ernst & Young LLP
St. Louis, Missouri
March 11, 1999

SHEFFIELD PHARMACEUTICALS, INC. AND SUBSIDIARIES
(a development stage enterprise)
CONSOLIDATED BALANCE SHEETS

Assets	December 31, 1998	1997
Current assets:		
Cash and cash equivalents	$ 2,456,290	$ 393,608
Marketable equity security	127,774	--
Loan receivable - former officer	--	80,000
Prepaid expenses and other current assets	39,035	47,378
Total current assets	2,623,099	520,986
Property and equipment:		
Laboratory equipment	317,032	185,852
Office equipment	175,062	142,562
Leasehold improvements	1,323	--
Total at cost	493,417	328,414
Less accumulated depreciation and amortization	(253,995)	(185,201)
Property and equipment, net	239,422	143,213
Other assets	--	25,738
Total assets	$ 2,862,521	$ 689,937

Total assets	$ 2,862,521	$ 689,937

LIABILITIES AND STOCKHOLDERS' EQUITY (NET CAPITAL DEFICIENCY)

Current liabilities:		
Accounts payable and accrued liabilities	$ 615,138	$ 887,782
Sponsored research payable	449,805	470,768
Note payable - related party	101,323	--
Total current liabilities	1,166,266	1,358,550
Convertible promissory note	1,000,000	--
6% convertible subordinated debenture	--	1,551,000
Other long-term liabilities	41,050	28,875
Series A cumulative convertible redeemable preferred stock, $.01 par value, authorized 40,000 shares; 0 and 25,000 shares issued and outstanding December 31, 1998 and 1997, respectively	--	2,468,263
Commitments and contingencies	--	--
Total liabilities	2,207,316	5,406,688
Stockholders' equity (net capital deficiency):		
Preferred stock, $.01 par value, authorized 3,000,0000 shares:		
Series C cumulative convertible preferred stock, authorized 23,000 shares; 11,914 and 0 shares issued and outstanding at December 31, 1998 and 1997, respectively	119	--
Common stock, $.01 par value, authorized 50,000,000 shares; issued and outstanding, 27,058,419 and 12,649,539 shares at December 31, 1998 and 1997, respectively	270,584	126,495
Notes receivable in connection with sale of stock	(10,000)	(72,600)
Additional paid-in capital	55,773,491	31,386,644
Other comprehensive income (loss)	(222,226)	--
Deficit accumulated during development stage	(55,156,763)	(36,157,290)
Total stockholders' equity (net capital deficiency)	655,205	(4,716,751)
Total liabilities and stockholders' equity (net capital deficiency)	$ 2,862,521	$ 689,937

See notes to consolidated financial statements.

SHEFFIELD PHARMACEUTICALS, INC. AND SUBSIDIARIES
(a development stage enterprise)

Consolidated Statements of Operations
For the Years Ended December 31, 1998, 1997 and 1996 and for the Period from October 17, 1986 (inception) to December 31, 1998

	Years Ended December 31,			October 17, 1986 (inception) to December 31,
	1998	1997	1996	1998
Revenues:				
Sublicense revenue	$ 350,000	$ 500,000	$ 510,000	$ 1,360,000
Interest income	60,273	56,914	163,664	514,100
Total revenues	410,273	556,914	673,664	1,874,100
Expenses:				
Acquisition of research and development in-process technology	13,325,000	1,650,000	--	14,975,000
Research and development	2,351,301	3,729,193	3,841,818	21,603,690
General and administrative	3,043,070	4,627,567	3,831,204	19,565,329
Interest	251,363	39,292	9,531	411,118
Total expenses	18,970,734	10,046,052	7,682,553	56,555,137
Loss before extraordinary item	(18,560,461)	(9,489,138)	(7,008,889)	(54,681,037)
Extraordinary item	--	--	--	42,787
Net loss	$(18,560,461)	$ (9,489,138)	$ (7,008,889)	$(54,638,250)
Accretion of mandatorily redeemable preferred stock	(23,900)	(79,500)	--	(103,400)
Net loss - attributable to common shares	$(18,584,361)	$ (9,568,638)	$ (7,008,889)	$(54,741,650)
Weighted average common shares outstanding-basic	21,931,040	11,976,090	10,806,799	6,336,589
Net loss per share of common stock - basic:				
Loss before extraordinary item	$ (0.85)	$ (0.80)	$ (0.65)	$ (8.63)
Extraordinary item	--	--	--	.01
Net loss per share	$ (0.85)	$ (0.80)	$ (0.65)	$ (8.62)

See notes to consolidated financial statements.

SHEFFIELD PHARMACEUTICALS, INC. AND SUBSIDIARIES
(a development stage enterprise)
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (NET CAPITAL DEFICIENCY)
For the Period from October 17, 1986 (Inception) to December 31, 1998

	Preferred Stock	Common Stock	Notes receivable in connection with sale of Stock	Additional paid-in Capital	Other comprehensive income (loss)	Deficit accumulated during development Stage	Total stockholders' equity (net capital Deficiency)
Balance at October 17, 1986	$--	$ --	$ --	$ --	$ --	$ --	$ --
Common stock issued	--	11,315,985	--	9,981,141	--	--	21,297,126
Reincorporation in Delaware at $.01 par value	--	(11,220,369)	--	11,220,369	--	--	--
Common stock options issued	--	--	--	75,000	--	--	75,000
Net loss	--	--	--	--	--	(19,579,763)	(19,579,763)
Balance at December 31, 1995	--	95,616	--	21,276,510	--	(19,579,763)	1,792,363
Common stock issued	--	18,267	--	7,043,328	--	--	7,061,595
Common stock subscribed	--	--	(110,000)	--	--	--	(110,000)
Comprehensive income (loss):							
Unrealized loss on marketable securities	--	--	--	--	(39,232)	--	(39,232)
Net loss	--	--	--	--	--	(7,008,889)	(7,008,889)
Comprehensive income (loss)	--	--	--	--	--	--	(7,048,121)
Balance at December 31, 1996	--	113,883	(110,000)	28,319,838	(39,232)	(26,588,652)	1,695,837
Issuance of common stock in connection with acquisition of Camelot Pharmacal, L.L.C	--	6,000	--	1,644,000	--	--	1,650,000
Common stock issued	--	6,612	37,400	1,041,750	--	--	1,085,762
Common stock options and warrants issued	--	--	--	165,868	--	--	165,868
Common stock options extended	--	--	--	215,188	--	--	215,188
Accretion of issuance costs for Series A preferred stock	--	--	--	--	--	(79,500)	(79,500)
Comprehensive income (loss):							
Unrealized gain on marketable securities	--	--	--	--	39,232	--	39,232
Net loss	--	--	--	--	--	(9,489,138)	(9,489,138)
Comprehensive income (loss)	--	--	--	--	--	--	(9,449,906)
Balance at December 31, 1997	--	126,495	(72,600)	31,386,644	--	(36,157,290)	(4,716,751)
Common stock issued	--	144,089	62,600	12,472,966	--	--	12,679,655
Series C preferred stock issued	115	--	--	11,499,885	--	--	11,500,000
Series C preferred stock dividends	4	--	--	413,996	--	(415,112)	(1,112)

Series C preferred stock dividends	--	--	--	--	--	(113,990)	(113,990)
Accretion of issuance costs for Series A preferred stock	--	--	--	--	--	(23,900)	(23,900)
Comprehensive income (loss):							
Unrealized loss on marketable securities	--	--	--	--	(222,226)	--	(222,226)
Net loss	--	--	--	--	--	(18,560,461)	(18,560,461)
Comprehensive income (loss)	--	--	--	--	--	--	(18,786,687)
Balance at December 31, 1998	$119	$ 270,584	$ (10,000)	$55,773,491	$(222,226)	$(55,156,763)	$ 655,205

See notes to consolidated financial statements.

SHEFFIELD PHARMACEUTICALS, INC. AND SUBSIDIARIES
(a development stage enterprise)
Consolidated Statements Of Cash Flows

For the Years Ended December 31, 1998, 1997 and 1996 and for the Period from October 17, 1986 (Inception) to December 31, 1998

	Years Ended December 31,			October 17, 1986 (inception) to December 31,
	1998	1997	1996	1998
Cash outflows from development stage activities and extraordinary gain: Loss before extraordinary item	$(18,560,461)	$(9,489,138)	$(7,008,889)	$(54,681,037)
Extraordinary gain on extinguishment of debt	--	--	--	42,787
Net loss	(18,560,461)	(9,489,138)	(7,008,889)	(54,638,250)
Adjustments to reconcile net loss to net cash used by development stage activities:				
Issuance of common stock, stock options/warrants for services	359,913	381,056	640,762	2,281,973
Non-cash interest income	(670)	--	--	(670)
Non-cash interest expense	64,844	28,875	--	143,717
Non-cash acquisition of research and development in process technology	--	1,650,000	--	1,650,000
Issuance of common stock for license	--	--	--	5,216
Securities acquired under sublicense agreement	(350,000)	--	(500,000)	(850,000)
Issuance of common stock for intellectual property rights	--	--	--	866,250
Depreciation and amortization	68,794	84,584	71,652	393,219
Increase in debt issuance and organizational costs	--	--	--	(77,834)
Loss realized on sale of marketable securities	--	324,915	--	324,915
Decrease (increase) in prepaid expenses & other current assets ...	8,343	(3,403)	109,810	(98,076)
Decrease in other assets	25,738	14,278	44,354	59,041
Increase (decrease) in accounts payable, accrued liabilities	(279,264)	440,817	245,680	31,448
Increase (decrease) in sponsored research payable	(20,963)	(109,389)	352,755	1,026,875
Net cash used by development stage activities	(18,682,726)	(6,677,405)	(6,042,876)	(48,882,176)

Net cash used by development stage activities	(18,683,726)	(6,677,405)	(6,043,876)	(48,882,176)
Cash flows from investing activities:				
Proceeds on sale of marketable securities	--	175,085	--	175,085
Acquisition of laboratory and office equipment, and leasehold improvements	(131,772)	(53,543)	(51,136)	(449,124)
Decrease (increase) in segregated cash	--	75,000	(75,000)	--
Increase in notes receivable in connection with sale of stock	--	--	(240,000)	(240,000)
Decrease (increase) in loan receivable - former officer	80,000	(80,000)	--	--
Payments of notes receivable	52,200	37,400	130,000	219,600
Purchase of Camelot Pharmacal, L.L.C., net cash acquired	--	(46,687)	--	(46,687)
Net cash provided (used) by investing activities	428	107,255	(236,136)	(341,126)
Cash flows from financing activities:				
Principal payments under capital lease	(4,020)	(50,925)	(21,528)	(76,473)
Proceeds from notes payable - related party	150,000	--	--	150,000
Repayments of notes payable - related party	(50,000)	--	--	(50,000)
Proceeds from issuance of convertible notes	1,000,000	--	--	1,000,000
Conversion of convertible, subordinated notes	--	--	--	749,976
Proceeds from issuance of convertible debenture	--	1,750,000	--	2,300,000
Proceeds from issuance of common stock	8,150,000	--	--	21,418,035
Proceeds from issuance of preferred stock	12,750,000	3,284,812	--	16,034,812
Redemption of preferred stock	(1,250,000)	--	--	(1,250,000)
Proceeds from exercise of warrants/stock options	--	--	6,420,834	11,402,158
Net cash provided by financing activities	20,745,980	4,983,887	6,399,306	51,678,508
Net increase (decrease) in cash and cash equivalents	2,062,682	(1,586,263)	119,294	2,455,206
Cash and cash equivalents at beginning of period	393,608	1,979,871	1,860,577	1,084
Cash and cash equivalents at end of period	$ 2,456,290	$ 393,608	$ 1,979,871	$ 2,456,290
Noncash investing and financing activities:				
Common stock, stock options and warrants issued for services	$ 359,913	$ 381,056	$ 640,762	$ 2,281,973
Common stock redeemed in payment of notes receivable	10,400	--	--	10,400
Acquisition of research and development in-process technology	--	1,650,000	--	1,655,216
Common stock issued for intellectual property rights	--	--	--	866,250
Common stock issued to retire debt	--	--	--	600,000
Common stock issued to redeem convertible securities	4,019,263	1,334,105	--	5,353,368
Securities acquired under sublicense agreement	350,000	--	500,000	850,000
Equipment acquired under capital lease	49,231	--	72,453	121,684
Notes payable converted to common stock	--	--	--	749,976
Stock dividends	596,195	182,352	--	778,547
Supplemental disclosure of cash flow information: Interest paid	$ 186,519	$ 10,417	$ 9,531	$ 267,401

See notes to consolidated financial statements.

SHEFFIELD PHARMACEUTICALS, INC. AND SUBSIDIARIES
(a development stage enterprise)
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
For the Years Ended December 31, 1998, 1997 and 1996

1. DESCRIPTION OF BUSINESS AND BASIS OF PRESENTATION

Sheffield Medical Technologies Inc. ("Sheffield") was incorporated under Canadian law in October 1986. In May 1992, the Company became domesticated as a Wyoming Corporation pursuant to a "continuance" procedure under Wyoming law. In January 1995, the Company's shareholders approved the proposal to reincorporate Sheffield in Delaware, which was effected on June 13, 1995. On January 10, 1996, Ion Pharmaceuticals, Inc. ("Ion"), was formed as a wholly owned subsidiary of the Company. At that time, Ion acquired the Company's rights to certain early-stage biomedical technologies. On April 17, 1997, CP Pharmaceuticals, Inc. ("CP") was formed for the purpose of acquiring Camelot Pharmacal, L.L.C., a privately held pharmaceutical development company, which acquisition was consummated on April 25, 1997. In June 1997, the Company's shareholders approved the proposal to change Sheffield's name from Sheffield Medical Technologies Inc. to Sheffield Pharmaceuticals, Inc. As part of an agreement with Elan Corporation, plc, ("Elan") on June 30, 1998, Systemic Pulmonary Delivery, Ltd. ("SPD") was formed as a wholly owned subsidiary of the Company. At that time, SPD acquired the Company's rights to the systemic applications of the Metered Solution Inhaler ("MSI") and acquired Elan's rights to certain pulmonary delivery technologies. Unless the context requires otherwise, Sheffield, Ion, CP and SPD are referred herein to as "the Company." All significant intercompany transactions are eliminated in consolidation.

The accompanying consolidated financial statements have been prepared on a going concern basis which contemplates the realization of assets and satisfaction of liabilities and commitments in the normal course of business. The Company is in the development stage and to date has been principally engaged in research, development and licensing efforts. The Company has generated minimal operating revenue, sustained significant net operating losses, and requires additional capital that the Company intends to obtain through out-licensing as well as through equity and debt offerings to continue to operate its business. The Company's ability to meet its obligations as they become due and to continue as a going concern must be considered in light of the expenses, difficulties and delays frequently encountered in developing a new business, particularly since the Company will focus on product development that may require a lengthy period of time and substantial expenditures to complete. Even if the Company is able to successfully develop new products, there can be no assurance that the Company will generate sufficient revenues from the sale or licensing of such products to be profitable. Management believes that the Company's ability to meet its obligations as they become due and to continue as a going concern through December 1999 is dependent upon obtaining additional funding. However, the accompanying financial statements do not include any adjustments that might result from the outcome of this uncertainty.

2. SIGNIFICANT ACCOUNTING POLICIES

CASH EQUIVALENTS - The Company considers all highly liquid instruments with original maturities of three months or less to be cash equivalents.

MARKETABLE SECURITIES - Marketable securities generally

consist of investments that can be readily purchased or sold using established markets. The Company's securities, which are classified as available-for-sale, are carried at market with unrealized gains and losses reported as a separate component of other comprehensive income within stockholders' equity.

PROPERTY AND EQUIPMENT - Property and equipment are stated at cost. Depreciation is computed using the straight-line method over three or five year periods for leasehold improvements and office equipment, and five years for laboratory equipment. Assets under capital leases, consisting of office equipment, are amortized over the lesser of the useful life or the applicable lease terms.

RESEARCH AND DEVELOPMENT COSTS - Research and development costs ("R & D costs") are expensed as incurred, except for fixed assets to which the Company has title, which are capitalized and depreciated over their estimated useful lives.

FAIR VALUE OF FINANCIAL INSTRUMENTS - The carrying amounts of cash and cash equivalents, accounts payable, sponsored research payable and notes payable approximates fair value.

BASIC NET LOSS PER SHARE OF COMMON STOCK - Basic net loss per share is calculated in accordance with Statement of Financial Accounting Standards ("SFAS") No. 128, EARNINGS PER SHARE. Basic net loss per share is based upon the weighted average common stock outstanding during each year. Potentially dilutive securities such as stock options, warrants, convertible debt and preferred stock, have not been included in any years presented as their effect is antidilutive. The effect of adoption of SFAS No. 128 had no financial impact, and accordingly, no restatement of loss per share for prior years was necessary.

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

STOCK-BASED COMPENSATION - SFAS No. 123, ACCOUNTING FOR STOCK-BASED COMPENSATION, defines a fair value method of accounting for stock options and similar equity instruments. As permitted by SFAS 123, the Company continues to account for such transactions under Accounting Principal Board Opinion No. 25, ACCOUNTING FOR STOCK ISSUED TO EMPLOYEES ("APB 25"), and has disclosed in a note to the financial statements pro forma net loss and earnings per share as if the Company had applied the fair value method of accounting for its stock-based awards. Under APB 25, no expense is generally recognized at the time of option grant because the exercise price of the Company's employee stock option equals or exceeds the fair market value of the underlying common stock on the date of grant.

IMPACT OF RECENTLY ISSUED ACCOUNTING STANDARDS - In

1998, the Company adopted SFAS No. 130, REPORTING COMPREHENSIVE INCOME, which establishes standards for the reporting and display of comprehensive income and its components in a full set of general purpose financial statements and applies to all enterprises. In accordance with SFAS No. 130, the Company has changed the format of its consolidated statements of stockholders' equity to present comprehensive income. Other comprehensive income or loss shown in the consolidated statements of stockholders' equity at December 31, 1998, 1997 and 1996 is solely comprised of unrealized gains or losses on marketable securities. The unrealized gain on marketable securities during 1997 includes reclassification adjustments for $324,915 of losses realized in income from the sale of the securities.

In 1998, the Company also adopted SFAS No. 131, DISCLOSURES ABOUT SEGMENTS OF AN ENTERPRISE AND RELATED INFORMATION, which establishes standards for the way that public business enterprises report information about operating segments in annual financial statements and requires that those enterprises report selected information about operating segments in interim financial reports. It also establishes standards for related disclosures about products and services, geographic areas and major customers. The Company has no reportable segments as defined by SFAS No. 131.

3. ACQUISITION

On April 25, 1997, the Company completed its acquisition of Camelot Pharmacal, L.L.C., ("Camelot") a newly formed, privately held Missouri limited liability company focusing on the development of specialty pharmaceuticals. The purchase price consisted of 600,000 shares of the Company's Common Stock (valued at $2.75 per share) and the assumption of certain liabilities in excess of tangible assets acquired of $8,262 (see Note 5). The transaction was treated as a purchase for accounting purposes, and accordingly, the assets and liabilities assumed have been recorded at their estimated fair market values at the date of acquisition. Since technological feasibility of the in-process research and development costs have not yet been established and the technology had no alternative future use at the acquisition date, the in-process research and development costs of $1,650,000 were immediately written-off and included in the results of operations as a non-recurring charge for the year ended December 31, 1997. Camelot had no revenue and minimal operating losses for the period ended April 24, 1997 and therefore proforma disclosure has not been included.

4. LEASES

The Company leases its office space and certain equipment under noncancelable operating and capital leases that expire at various dates through 2003. During 1998, the Company entered into an equipment lease that qualifies as a capital lease. At December 31, 1998, assets held under capital leases consisting of office equipment were $41,026, net of accumulated amortization of $8,205. Future minimum lease payments under capital and operating leases at December 31, 1998 are as follows:

	Capital Leases	Operating Leases
1999	$9,375	$129,452
2000	9,375	121,351
2001	9,375	115,997

2002.....	9,375	78,364
2003.....	1,563	--
Total minimum lease payments.....	39,063	$445,164
Less amount representing interest.....	(9,854)	
Present value of net minimum lease payments.....	29,209	
Less current maturities of capital lease obligations.....	(5,507)	
Capital lease obligations.....		$23,702

Rent expense relating to operating leases for the years ended December 31, 1998, 1997, 1996 and the period from October 17, 1986 (inception) to December 31, 1998 was $143,126, $190,584, and $147,104, and $666,235, respectively.

5. STOCKHOLDERS' EQUITY

The following table represents the issuance of Common Stock since the Company's incorporation:

	Number of common Shares Issued
Date of incorporation	900,000
Issued during year ended December 31, 1986	990,000
Issued during year ended December 31, 1991	412,500
Issued during year ended December 31, 1992	850,000
Issued during year ended December 31, 1993	2,509,171
Issued during year ended December 31, 1994	1,134,324
Issued during year ended December 31, 1995	2,765,651
Issued during year ended December 31, 1996	1,826,628
Issued during year ended December 31, 1997	1,261,265
Issued during year ended December 31, 1998	14,408,880
Balance outstanding at December 31, 1998	27,058,419

The shares issued during 1993 included (i) 1,666,668 shares related to the initial public offering; (ii) 272,500 shares related to the exercise of warrants at a price of Can. $3.50 per share; (iii) 31,250 shares

as consideration for fiscal agency fees; (iv) 10,000 shares related to the exercise of warrants at a price of Can. $1.00 per share; (v) 524,753 shares related to the conversion of 10% Convertible Notes at an average price of Can. $1.82 per share; (vi) 4,000 shares to members of the Scientific Advisory Board, in consideration of their services, at $1.78 per share.

Under the UGIF Technology Option Agreement (the "Option Agreement") dated November 11, 1992, and approved by the shareholders of the Company on December 2, 1993, the Company obtained an option from E/J Development Corporation d/b/a TechSource Development Corporation ("TechSource") to acquire an exclusive sublicense to the UGIF Technology in exchange for 300,000 shares of Common Stock of the Company (after taking into account a one-for-two reverse stock split effective on February 11, 1993). Mr. Douglas R. Eger, who was formerly Chairman of the Company, is a former 50% shareholder of TechSource. On January 10, 1994, TechSource assigned its right to receive 215,000 shares of Common Stock pursuant to the Option Agreement to Mr. Eger and assigned its right to receive 85,000 shares of Common Stock pursuant to the Option Agreement to Mr. A.M. Jenke, a former director and officer of the Company. Effective January 10, 1994, the Company issued such shares to Messrs. Eger and Jenke at approximately $0.02 per share (market value of $4.8125 per share) on January 10, 1994, at which time the Company recorded the estimated fair market value of $866,250 as an expense. Mr. Eger sold his interest in TechSource to Mr. Jenke in September 1994.

In March 1994, a total of $3,121,164 was received from the exercise of 832,324 of the Company's Redeemable Stock Purchase Warrants issued in connection with the Company's February 1993 initial United States public offering of 833,334 units, each such unit consisting of two shares of Common Stock and one Redeemable Common Stock Purchase Warrant exercisable for one share of Common Stock at a price of $3.75, net of the buyback of 1,010 warrants at $0.05 per warrant.

In April 1995, gross proceeds of $3,280,600 were received through the issuance of 410,075 units by private placement at a price of $8.00 per unit. Each such unit consisted of two shares of the Company's Common Stock and a warrant to purchase one share of Common Stock at a price of $5.00 at any time up until and including February 10, 2000. The warrants are redeemable by the Company under certain circumstances and contain antidilutive provisions whereby the Common Stock to be purchased under the warrants and the related exercise price are adjusted to reflect the completion of certain stock transactions (see Note 6).

On January 23, 1995, SMT Investment Partnership ("SMT") made a 10% loan (the "SMT Loan") to the Company in the principal amount of $550,000 pursuant to a demand loan agreement (the "SMT Loan Agreement"). Under the terms of the SMT Loan Agreement, SMT could demand the payment in full of the SMT Loan at any time or December 31, 1996 whichever came first. To secure the Company's obligations under the SMT Loan Agreement, the Company granted SMT a security interest in substantially all of the Company's assets, which security interest has since been released. The note evidencing the SMT Loan (the "Original SMT Note") was exchanged pursuant to the terms of the SMT Loan

Agreement for a new note (the "SMT Convertible Note") that permitted the holder to exchange the SMT Convertible Note (in whole or in part) into 200,000 shares of Common Stock. In addition, the SMT Loan Agreement required the Company upon issuance of the SMT Convertible Note to issue to SMT warrants (the "SMT Warrants") to acquire 200,000 shares of Common Stock at any time within five years after the date of issue for a price of $4.00 per share. The SMT Warrants are redeemable by the Company for $4.00 per share at any time after the price of the Common Stock exceeds an average of $6.00 per share for 20 business days. In addition, the SMT Warrants contain certain antidilutive provisions whereby the Common Stock to be purchased under the warrants and the related exercise price are adjusted to reflect the completion of certain transactions (see Note 6). SMT was granted certain registration rights with respect to the Common Stock issuable to SMT upon conversion of the SMT convertible Note and SMT Warrants. By letter dated June 1, 1995, SMT exercised its right to convert the SMT Convertible Note into 200,000 shares of Common Stock and subsequently assigned the right to such shares to an unaffiliated third party.

In July 1995, the Company completed a private placement of 1,375,000 units to accredited investors at a price of $4.00 per unit for gross proceeds of $5,500,000. Each such unit consists of one share of the Company's Common Stock and a warrant to purchase one share of Common Stock at a price of $4.50 at any time up until and including February 10, 2000. The warrants are redeemable by the Company under certain circumstances and contain certain antidilutive provisions whereby the Common Stock to be purchased under the warrants and the related exercise price are adjusted to reflect the completion of certain stock transactions (see Note 6).

On April 30, 1996, the Company completed its warrant discount program through which the Company offered holders of warrants issued in private placements completed in 1995 the opportunity to exercise such warrants at up to a 121/2 % discount from the actual exercise prices of such warrants. A total of $5.6 million was received from the exercise of such warrants with the related issuance of 1,373,250 shares of Common Stock.

On February 26, 1997, 35,700 shares of Series A Preferred Stock were issued pursuant to a private placement. Holders of Series A Preferred Stock have the right, exercisable commencing May 29, 1997 and ending February 28, 1999, to convert shares of Series A Preferred Stock into shares of Common Stock. The number of shares of Common Stock issuable upon conversion of Series A Preferred Stock is determined by reference to the lesser of (i) $3.31875 and (ii) 85% of the "current market price" per share of Common Stock, where "current market price" means, with certain exceptions, the average of the closing bid prices of Common Stock for the 10 consecutive trading days ending the last trading day before the applicable conversion date. Each share of Series A Preferred Stock earns a cumulative dividend payable in shares of Common Stock at a rate per share equal to 7.0% of the original $100 purchase price per share of the Series A Preferred Stock payable at the time of conversion. As of December 31, 1997, 25,000 shares of Series A Preferred Stock were outstanding. Between August 26, 1997 and December 31, 1997, 10,700 shares of Series A Preferred stock, plus related accrued dividends, were converted into 44,769 shares of Common Stock. In 1998, the remaining balance of the Company's outstanding Series A Preferred Stock, plus related dividends payable, were converted to Common Stock, resulting in the issuance of 4,075,797 shares of Common Stock.

On April 25, 1997, Camelot, merged with and into CP Pharmaceuticals, Inc., a newly formed, wholly owned subsidiary of the Company.

The principals of Camelot at the time of the merger were Loren G. Peterson, Carl F. Siekmann and David A. Byron. Pursuant to the related agreement and plan of merger, Messrs. Peterson, Siekmann and Byron each received 200,000 shares of Common Stock. Following the consummation of the merger, each of Messrs. Peterson, Siekmann and Byron entered into employment agreements with Sheffield and received stock options providing each individual the right to purchase up to 400,000 shares of Common Stock (see Note 3).

On September 22, 1997, the Company consummated a private placement of $1,750,000 principal amount of its 6% Convertible Subordinated Debentures ("Debentures") due September 22, 2000. In addition, the Company granted the holder of the Debenture warrants to purchase 140,000 shares of the Company's Common Stock at $2.80 per share. A value of $115,500 was assigned to these warrants. The Debentures are convertible at the option of holders from December 22, 1997 until maturity, subject to certain limitations, into a number of shares of Common Stock equal to (i) the principal amount of the Debenture being so converted divided by (ii) 75% of the market price of the Common Stock as of the date of conversion. For purposes of any conversion of Debentures, "market price" generally means the average of the closing prices of the Common Stock for the five trading day period preceding the applicable conversion date. The Debentures also earn interest at a rate of 6.0% per annum that is payable by the Company, at the option of the holders and subject to certain conditions, in shares of its Common Stock at a conversion rate generally equal to the average of the closing prices of the Common Stock for the ten trading days preceding the applicable interest payment date. During 1998, the Debentures were converted to Common Stock resulting in the issuance of 2,925,941 shares of common stock.

On April 15, 1998, the Company issued 1,250 shares of its Series B Cumulative Convertible Redeemable Preferred Stock in a private placement for an aggregate purchase price of $1,250,000. In addition, the Holder of Series B Preferred Stock was issued warrants to acquire 300,000 shares of Common Stock at any time up until and including April 15, 2001 for a price of $1.00 per share. Each share of Series B Preferred Stock earns a cumulative dividend payable at a rate per share equal to 6% per annum. On July 31, 1998, the Company redeemed all of the Series B Preferred Stock and accrued dividends for cash.

During 1998, the Company entered into an agreement with Zambon Group, SpA ("Zambon") of Milan, Italy, for a sublicense to the Company's proprietary MSI drug delivery system (see Note 8). Pursuant to an option agreement dated April 15, 1998, the Company issued 800,000 shares of Common Stock for $650,000 in cash. On June 15, 1998, the Company entered into the definitive agreement, resulting in the issuance of an additional 1,846,153 shares of Common Stock for $1,500,000.

On June 30, 1998, the Company issued 4,571,428 shares of Common Stock and 11,500 shares of Series C Cumulative Convertible Preferred Stock, convertible into shares of Common Stock of the Company or of its wholly-owned subsidiary, SPD, for $17.5 million pursuant to a definitive agreement with Elan. The Series C Preferred Stock earns cumulative dividend payable in shares of Series C Preferred Stock at a rate of 7.0% on the stated

value of each outstanding share of Series C Preferred Stock on the dividend date. Elan also received a warrant to purchase 990,000 shares of Common Stock of the Company exercisable from December 31, 1998 through January 30, 2005 at an exercise price of $2.00 per share. Under the terms of the agreement, the Company, through SPD, acquired certain pulmonary delivery technologies for the sum of $12.5 million in cash (see Note 8). All of the outstanding common stock of SPD is pledged to Elan during the term of the agreement. The net book value of SPD is $1.6 million as of December 31, 1998. During 1998, the Company issued stock dividends totaling 414 shares of Series C Preferred Stock and cash dividends for fractional shares of $1,112.

6. STOCK OPTIONS AND WARRANTS

The 1993 Stock Option Plan (the "Option Plan") was adopted by the Board of Directors in August 1992 and approved by the shareholders at the annual meeting in December 1993. An amendment to the Option Plan increasing the number of shares of Common Stock available for issuance thereunder from 3,000,000 shares to 4,000,000 shares received shareholder approval on July 15, 1998. The Option Plan permits the grant to employees and officers of the Company of both incentive stock options and non-statutory stock options. The Option Plan is administered by the Board of Directors or a committee of the Board, which determines the persons to whom options will be granted and the terms thereof, including the exercise price, the number of shares subject to each option, and the exercisability of each option. The exercise price of all options for Common Stock granted under the Option Plan must be at least equal to the fair market value on the date of grant in the case of incentive stock options and 85% of the fair market value on the date of grant in the case of non-statutory stock options. Options generally expire five to ten years from the date of grant and vest either over time or upon the Company's Common Stock attaining a set market price for a certain number of trading days. As of December 31, 1998, options available for grant under the Option Plan are 1,559,000.

The 1993 Restricted Stock Plan (the "Restricted Plan") was adopted by the Board of Directors in August 1992 and approved by the shareholders at the annual shareholders meeting in December 1993. The Restricted Plan authorized the grant of a maximum of 150,000 shares of Common Stock to key employees, consultants, researchers and members of the Company's Scientific Advisory Board. The Restricted Plan is administered by the Board of Directors or a committee of the Board, which determines the person to whom shares will be granted and the terms of such share grants. As of December 31, 1998, no shares have been granted under the Restricted Plan.

The 1996 Directors Stock Option Plan (the "Directors Plan") was adopted by the Board of Directors and approved by the shareholders on June 20, 1996. Under the Directors Plan, the maximum aggregate number of shares which may be optioned and sold is 500,000 shares of Common Stock. The Directors Plan initially granted each eligible director 15,000 stock options. To the extent that shares remain available, any new directors shall receive the grant of an option to purchase 25,000 shares. To the extent that shares remain available under the Directors Plan, on January 1 of each year commencing January 1, 1997, each eligible director shall be granted an option to purchase 15,000 shares. The exercise price of all options granted under the Directors Plan shall be the fair market value at the date of the grant. Options generally expire five years from the date of grant. As of the December 31, 1998, there are 305,000 options available for grant under the Directors Plan.

Transactions involving stock options and warrants are summarized as follows:

	1998		1997		1996	
	Common Stock Options	Weighted Average Exercise Price	Common Stock Options	Weighted Average Exercise Price	Common Stock Options	Weighted Average Exercise Price
Outstanding, January 1,	4,781,290	3.65	3,033,755	4.49	4,164,834	4.02
Granted	3,162,910	1.81	3,683,039	3.92	1,014,922	5.52
Expired	283,504	4.48	327,500	3.18	70,000	3.77
Exercised	--	--	--	--	1,942,501	3.76
Canceled	180,500	5.64	1,608,004	4.11	133,500	4.53
Revalued(1)	430,640	--	--	--	--	--
Outstanding December 31,	7,910,836	2.55	4,781,290	3.65	3,033,755	4.49
Exercisable at end of year	5,028,336	2.71	2,900,290	3.88	2,094,833	4.75

(1) Certain warrants issued by the Company during 1995 contain antidilutive provisions. These warrants total 615,325, and have exercise prices ranging from $4.00 to $5.00 per share. Pursuant to the antidilutive provisions of the warrants, the common shares to be purchased under the warrants were increased to 1,045,965 and the related exercise prices were adjusted to a range of $2.44 to $2.81 per share.

During the period January 1, 1996 through December 31, 1998, the exercise prices and weighted average fair value of options and warrants granted by the Company were as follows:

Year	Number Of Options/warrants	Weighted Average Exercise Price	Fair Value
1996	1,014,922	$3.38 - 8.25	$2.30
1997	3,683,039	$1.50 - 6.00	$4.05
1998	3,162,910	$1.00 - 3.69	$0.99

At December 31, 1998, outstanding warrants to purchase the Company's Common Stock are summarized as follows:

Range of Exercise Prices	Weighted Average Outstanding Warrants At December 31, 1998	Weighted Average Remaining Contractual Life (Years)	Weighted Average Exercise Price
$0.73 - $2.00	1,929,910	4.62	$1.63
$2.25 - $3.00	1,340,965	1.37	$2.61
$3.25 - $6.50	511,539	2.91	$3.73
	3,782,414	3.24	$2.26

At December 31, 1998, outstanding options to purchase the Company's Common Stock are summarized as follows:

Range of Exercise Prices	Weighted Average Outstanding Options At December 31, 1998	Weighted Average Remaining Contractual Life (Years)	Weighted Average Exercise Price
$1.24 - $2.75	2,881,000	6.56	$2.35
$3.00 - $4.00	879,922	3.85	$3.62
$4.06 - $6.25	367,500	2.80	$4.57
	4,128,422	5.65	$2.82

SFAS No. 123 requires pro forma information regarding net income and earnings per share as if the Company has accounted for its stock options granted subsequent to December 31, 1994, under the fair value method of SFAS No. 123. The fair value of these stock options is estimated at the date of grant using a Black-Scholes option pricing model with the following weighted average assumptions for 1998, 1997, and 1996: risk-free interest rate ranging from 4.39% to 6.23%; expected volatility ranging from 0.526 and 0.694; expected option life of one to ten years from vesting and an expected dividend yield of 0.0%.

For purposes of pro forma disclosures, the estimated fair value of the stock options and warrants is amortized to expense over the options' vesting period. The Company's pro forma information is as follows:

	1998	1997	1996
Pro forma net loss	$ 18,983,921	$ 9,500,810	$8,500,149
Pro forma basic net loss per share of common stock.....	$ 0.87	$ 0.79	$ 0.79

7. CONVERTIBLE PROMISSORY NOTE

As part of an agreement with Elan, Elan agreed to make available to the Company a Convertible Promissory Note ("Note") that provides the Company the right to borrow up to $2,000,000, subject to satisfying certain conditions. No more than $500,000 may be drawn under the Note in any calendar quarter and at least one-half of the proceeds must be used to fund SPD's development activities. The principal outstanding under the Note draws interest at the prime rate plus 1% and, if not previously converted, matures on June 30, 2005. Prior to repayment, Elan has the right to convert all principal and accrued interest into shares of the Company's Common Stock at a conversion price of $1.75 per share. As of December 31, 1998, the outstanding principal balance of the note was $1,000,000. On February 22, 1999, the Company borrowed an additional $500,000 under the Note.

8. RESEARCH AND DEVELOPMENT AGREEMENTS

In March 1997, the Company entered into exclusive supply and license agreements for the world-wide rights to the MSI system of Siemens A.G. The agreements call for Siemens to be the exclusive supplier of the MSI system. The Company paid licensing fees of $1.1 million in both April 1997 and 1998, to Siemens pursuant to these agreements. In addition, under certain circumstances, the Company will be required to make another DM 2.0 million payment to Siemens during 1999.

On June 15, 1998, the Company entered into an agreement with Zambon for a sublicense to the Company's proprietary MSI drug delivery system. Under this transaction, Zambon received an exclusive worldwide marketing and development sublicense for respiratory products to be delivered by the MSI system including four drugs currently under development by the Company. The Company maintained certain co-promotion rights in the U.S. for respiratory drugs as well as the world-wide marketing and development rights for all applications of the MSI delivery system outside the respiratory products. The Company was paid an up-front fee in the form of an equity investment and will receive milestone payments upon marketing approval for each of the four products and royalties upon commercialization. In addition, Zambon will provide the Company with an interest-free line of credit totaling $2,000,000 upon the achievement of certain early milestones.

On June 30, 1998, the Company issued certain equity securities pursuant to an agreement with Elan (see Note 5). Under the terms of the agreement, the Company, through its wholly owned subsidiary, SPD, acquired certain pulmonary delivery technologies for $12.5 million in cash. This payment was expensed during 1998 as acquired R&D in-process technology since the technologies acquired have not demonstrated technological feasibility and have no alternative future uses. The Company is responsible for the development of the systemic applications of these technologies (including the Aerosol Drug Delivery System ("ADDS") described below). Pursuant to its agreement with Elan, at December 31, 1998, the Company was committed to fund $2,076,000 of additional costs related to SPD's systemic development program.

On July 15, 1998, SPD acquired from Aeroquip-Vickers, Inc. a new generation metered dose inhaler system called the ADDS for $825,000. The purchase price has been expensed as acquired R&D in-process technology because the assets acquired, which consist solely of intellectual property

related to ADDS, have not demonstrated technological feasibility and have no alternative future uses. SPD holds the rights to all systemic disease applications of the ADDS technology while Sheffield retains the rights to develop the respiratory disease applications of ADDS.

The Company also is party to a number of license and research agreements, primarily with universities, hospitals, and research facilities, relating to early stage medical research projects that focus on the development of new compounds for the treatment of cancer, acquired immune deficiency syndrome and other diseases. As part of the Company's focus on later stage opportunities, the Company is seeking to out-license these projects. There can be no assurance that the Company will receive license fees or other payments related to these technologies. The Company believes these early stage license and research agreements will have no material impact on the financial position of the Company. For the year ended December 31, 1998, the Company funded approximately $22,000 related to these projects.

On November 20, 1997, the Company entered into a sublicense agreement with Lorus Therapeutics, Inc. (formerly Imutec Pharma Inc.). The agreement licenses rights to a series of clotrimazole-related compounds for the treatment of cancer, Kaposi's sarcoma and actinic keratosis to a newly formed company, NuChem Pharmaceuticals, Inc. ("NuChem"). In exchange, Lorus Therapeutics, Inc. ("Lorus") agreed to manage and fund the remaining development program. The Company received $500,000 in cash upon signing the agreement, which was recognized as revenue during the year ended December 31, 1997, and received 583,188 shares of Lorus stock valued at $350,000 which was recognized as revenue during the year end December 31, 1998. In addition, the Company is entitled to receive additional payments upon the completion of certain milestones in the development of these compounds and retains a 20 percent ownership interest in NuChem.

9. RELATED PARTY TRANSACTIONS

During 1998, three executive officers provided funds for use by the Company comprised of short-term notes having a 7% annual interest rate, unpaid salaries and unreimbursed expenses. The largest amount outstanding to the executive officers during 1998 was $241,740. As of December 31, 1998, all amounts under the short-term notes have been repaid.

During 1998, certain shareholders provided funds for use by the Company comprised of short-term notes totaling $150,000. These notes bore interest at the rate of 7% per annum and matured on September 8, 1998. On maturity, the Company repaid principal of $50,000 plus accrued interest, and extended the terms of the remaining principal balance to January 8, 1999. Subsequent to December 31, 1998, the Company amended the note extending its maturity to April 8, 1999.

10. INCOME TAXES

The Company utilizes the liability method to account for income taxes. Under this method, deferred tax assets and liabilities are determined based on differences between financial reporting and tax bases of assets and liabilities and are measured using enacted tax rates and laws that will be in effect when the differences are expected to reverse.

Deferred income taxes reflect the net effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of the Company's net deferred tax asset at December 31, 1998 and 1997 which are considered noncurrent, are as follows:

Deferred Tax Assets	1998	1997
Net operating loss carryforwards	$ 12,600,000	$ 12,400,000
Costs capitalized for tax purposes	14,391,000	578,000
Deferred tax asset valuation allowance ...	(26,991,000)	(12,978,000)
Net deferred tax asset	$ --	$ --

The Company has recorded a valuation allowance for the entire deferred tax asset due to the uncertainty of its realization. The net change in the total valuation allowance for the year ended December 31, 1998 was an increase of $14,013,000. As a result of changes in ownership, and pursuant to Internal Revenue Code Section 382, the net operating loss carryforwards are limited in offsetting future taxable income. Future changes in ownership may limit net operating loss carryforwards generated in the year of change. As a result of differences between book and tax requirements for writing off intangible assets acquired, such as in-process R&D, the Company has capitalized the in-process R&D for tax purposes. The deferred tax asset will be amortized into taxable income over a useful life of 15 years.

EX-10.6.5
2
EMPLOYMENT AGREEMENT

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EMPLOYMENT AGREEMENT

AGREEMENT made as of the 16th day of November, 1998, by and

between Sheffield Pharmaceuticals, Inc., a Delaware corporation with its principal offices at 425 South Woodsmill Road, Suite 270, St. Louis, Missouri 63017-3441 (the "Corporation"), and Scott A. Hoffmann, who currently resides at 17664 Wildridge Drive, Chesterfield, Missouri 63005 ("Executive").

W I T N E S S E T H :

WHEREAS, the Corporation desires to employ and retain Executive as its Vice President - Finance and Administration and Chief Financial Officer, upon the terms and subject to the conditions of this Agreement; and

NOW, THEREFORE, in consideration of the premises and the mutual covenants hereinafter set forth, the parties hereto agree as follows:

1. EMPLOYMENT OF EXECUTIVE. The Corporation hereby employs Executive as its Vice President - Finance and Administration and Chief Financial Officer, to perform the duties and responsibilities traditionally incident to such office, subject at all times to the control and direction of the Board of Directors of the Corporation.

2. ACCEPTANCE OF EMPLOYMENT; OFFICES; TIME AND ATTENTION, ETC. (a) Executive hereby accepts such employment and agrees that throughout the period of his employment hereunder, except as hereinafter provided, he will devote his full business and professional time in utilizing his business and professional expertise, with proper attention, knowledge and skills faithfully, diligently and to the best of his ability in furtherance of the business of the Corporation and its subsidiaries and will perform the duties assigned to him pursuant to Paragraph 1 hereof. As Vice President - Finance and Administration and Chief Financial Officer, Executive shall also perform such specific duties and shall exercise such specific authority related to the management of the day-to-day operations of the Corporation and its subsidiaries as may be reasonably assigned to Executive from time to time by the Board of Directors of the Corporation that are consistent with Executive's financial and administrative training and experience.

(b) Executive shall at all times be subject to, observe and carry out such rules, regulations, policies, directions and restrictions as the Board of Directors of the Corporation shall from time to time reasonably establish. During the period of his employment hereunder, Executive shall not, directly or indirectly, accept employment or compensation from, or perform services of any nature for, any business enterprise other than the Corporation and its subsidiaries. Notwithstanding the foregoing in this Paragraph 2, Executive shall not be precluded from engaging in (i) recreational, eleemosynary, educational and other activities, which activities do not materially interfere with his duties hereunder and shall occur during vacations, holidays and other periods

outside of business hours and (ii) any other educational activities that have been approved in advance by the Company's Chief Executive Officer.

3. TERM. Except as otherwise provided herein, the term of Executive's employment hereunder shall commence on the date hereof and shall continue to and including November 16, 2001. Unless terminated earlier in accordance with the terms hereof, this Agreement shall automatically be extended

for one or more additional consecutive one year terms unless either party notifies the other party in writing at least 90 days before the end of the then current term (including the initial term) of its or his desire to terminate or renegotiate the terms of this Agreement. The last day of the term of this Agreement pursuant to this Paragraph 3 (including any early termination pursuant to the terms hereof) is referred to herein as the "Termination Date."

4. COMPENSATION. (a) As compensation for his services hereunder, the Corporation shall pay to Executive (i) a base annual salary at the rate of $120,000, payable in equal installments in accordance with the normal payroll practices of the Corporation and (ii) such incentive compensation and bonuses, if any, as the Board of Directors of the Corporation in its absolute discretion may determine to award Executive (it being understood that this Agreement shall in no event be construed to require the payment to Executive of any incentive compensation or bonuses). All compensation paid to Executive shall be subject to withholding and other employment taxes imposed by applicable law.

(b) During the period of Executive's employment hereunder, Executive shall not be entitled to any additional compensation for rendering employment services to subsidiaries of the Corporation or for serving in any office of the Corporation or any of its subsidiaries to which he is elected or appointed.

5. STOCK OPTIONS. As additional compensation for his services hereunder, the Corporation shall grant to Executive an option under the Corporation's 1993 Stock Option Plan (the "Plan") to acquire a total of 120,000 shares of the Corporation's common stock at an exercise price per share no less than the closing sale price of the Corporation's common stock as reported by the American Stock Exchange on the date hereof, with the terms of such option to be evidenced by an option letter agreement in the form annexed as Exhibit "A" hereto.

6. ADDITIONAL BENEFITS; VACATION. (a) In addition to such base salary, Executive shall receive and be entitled to participate, to the extent he is eligible under the terms and conditions thereof, in any profit sharing, pension, retirement, hospitalization, disability, medical service, insurance or other employee benefit plan generally available to the executive officers of the Corporation that may be in effect from time to time during the period of Executive's employment hereunder. The Corporation agrees to cover Executive under any directors' and officers' liability policy maintained by the Corporation.

(b) Executive shall be entitled to three (3) weeks' paid vacation in respect of each 12-month period during the term of his employment hereunder, such vacation to be taken at times mutually agreeable to Executive and the Board of Directors of the Corporation.

(c) Executive shall be entitled to recognize as holidays all days recognized as such by the Corporation.

7. REIMBURSEMENT OF EXPENSES. The Corporation shall reimburse Executive in accordance with applicable policies of the Corporation for all expenses reasonably incurred by him in connection with the performance of his

duties hereunder and the business of the Corporation, upon the submission to the Corporation of appropriate receipts or vouchers.

8. RESTRICTIVE COVENANT. (a) In consideration of the Corporation's entering into this Agreement, Executive agrees that during the period of his employment hereunder and, in the event of termination of this Agreement (i) by the Corporation upon Executive becoming Disabled (as that term is defined in Paragraph 13 hereof), (ii) by the Corporation for Cause (as that term is defined in Paragraph 14 hereof) or (iii) by Executive otherwise than for Employer Breach (as that term is defined in Paragraph 15 hereof), for a further period of six months thereafter, he will not (x) directly or indirectly own, manage, operate, join, control, participate in, invest in, whether as an officer, director, employee, partner, investor or otherwise, any business entity that is engaged in a directly competitive business (as hereinafter defined) to that of the Corporation or any of its subsidiaries within the United States of America, (y) for himself or on behalf of any other person, partnership, corporation or entity, call on any customer of the Corporation or any of its subsidiaries for the purpose of soliciting away, diverting or taking away any customer from the Corporation or its subsidiaries, or (z) solicit any person then engaged as an employee, representative, agent, independent contractor or otherwise by the Corporation or any of its subsidiaries, to terminate him or his relationship with the Corporation or any of its subsidiaries. For purposes of this Agreement, the term "directly competitive business" shall mean any business that is then involved in the research, development, manufacturing or commercialization in any way of any product, compound, device or method that is or becomes a part of the Corporation's business or the business of any of its subsidiaries during Executive's employment by the Corporation or any of its subsidiaries. Nothing contained in this Agreement shall be deemed to prohibit Executive from investing his funds in securities of an issuer if the securities of such issuer are listed for trading on a national securities exchange or are traded in the over-the-counter market and Executive's holdings therein represent less than 10% of the total number of shares or principal amount of the securities of such issuer outstanding.

(b) Executive acknowledges that the provisions of this Paragraph 8 are reasonable and necessary for the protection of the Corporation, and that each provision, and the period or periods of time, geographic areas and types and scope of restrictions on the activities specified herein are, and are intended to be, divisible. In the event that any provision of this Paragraph 8, including any sentence, clause or part hereof, shall be deemed contrary to law or invalid or unenforceable in any respect by a court of competent jurisdiction, the remaining provisions shall not be affected, but shall, subject to the discretion of such court, remain in full force and effect.

9. CONFIDENTIAL INFORMATION.

(a) Executive shall hold in a fiduciary capacity for the benefit of the Corporation and its subsidiaries all confidential information, knowledge and data relating to or

concerned with its operations, sales, business and affairs, and he shall not, at any time during his employment hereunder and for two years thereafter, use, disclose or divulge any such information, knowledge or data to any person, firm or corporation other than to the Corporation and its subsidiaries or their respective designees or except as may otherwise be reasonably required or

desirable in connection with the business and affairs of the Corporation and its subsidiaries.

(b) Notwithstanding anything to the contrary contained herein, Executive's obligations under Paragraph 9(a) hereof shall not apply to any information which:

(i) becomes rightfully known to Executive subsequent or prior to his employment by the Corporation;

(ii) is or becomes available to the public other than as a result of wrongful disclosure by Executive;

(iii) becomes available to Executive subsequent to his employment by the Corporation on a nonconfidential basis from a source other than the Corporation or its agents which source has a right to disclose such information; or

(iv) results from research and development and/or commercial operations at any time by or on behalf of any person, company or other entity with which or with whom Executive shall become associated (in a manner consistent with the terms of this Agreement) subsequent to his employment by the Corporation or its agents totally independent from any disclosure from the Corporation or its agents.

(c) Notwithstanding anything to the contrary contained herein, in the event that Executive becomes legally compelled to disclose any confidential information, Executive will provide the Corporation with prompt notice so that the Corporation may seek a protective order or other appropriate remedy. In the event that such protective order or other remedy is not obtained, Executive shall furnish only such confidential information which is legally required to be disclosed.

10. INTELLECTUAL PROPERTY. Any idea, invention, design, written material, manual, system, procedure, improvement, development or discovery conceived, developed, created or made by Executive alone or with others, during the period of his employment hereunder and applicable to the business of the Corporation or any of its subsidiaries, whether or not patentable or registrable, shall become the sole and exclusive property of the Corporation or such subsidiary. Executive shall disclose the same promptly and completely to the Corporation and shall, during the period of his employment hereunder and at any time and from time to time hereafter at no cost to Executive (i) execute all documents reasonably requested by the Corporation for vesting in the Corporation or any of its subsidiaries the entire right, title and interest in and to the same, (ii) execute all documents reasonably requested by the Corporation for filing and prosecuting such applications for patents, trademarks, service marks and/or copyrights as the Corporation, in its sole discretion, may desire to prosecute, and (iii) give the Corporation all assistance it reasonably requires, including the giving of testimony in any suit, action or proceeding, in order to obtain, maintain and protect the Corporation's right therein and thereto.

11. EQUITABLE RELIEF. The parties hereto acknowledge that Executive's services are unique and that, in the event of a breach or a threatened breach by Executive of any of his obligations under Paragraphs 8, 9

or 10 this Agreement, the Corporation shall not have an adequate remedy at law. Accordingly, in the event of any such breach or threatened breach by Executive, the Corporation shall be entitled to such equitable and injunctive relief as may be available to restrain Executive and any business, firm, partnership, individual, corporation or entity participating in such breach or threatened breach from the violation of the provisions of Paragraph 8, 9 or 10 hereof. Nothing herein shall be construed as prohibiting the Corporation from pursuing any other remedies available at law or in equity for such breach or threatened breach, including the recovery of damages and the immediate termination of the employment of Executive hereunder, if and to the extent permitted hereunder.

12. TERMINATION OF AGREEMENT; TERMINATION OF EMPLOYMENT; SEVERANCE; SURVIVAL. (a) This Agreement and Executive's employment hereunder shall terminate upon the first to occur of the following: (i) Executive becoming Disabled (as that term is defined in Paragraph 13 hereof); (ii) Executive's death; (iii) termination of Executive's employment by the Corporation for Cause or pursuant to subparagraph (b) of this Paragraph 12; (iv) termination of Executive's employment for Employer Breach and (v) the termination of this Agreement at the end of the term of this Agreement on the Termination Date pursuant to Paragraph 3.

(b) Notwithstanding anything to the contrary contained in this Agreement, in the event of the termination of the Employee's employment by the Corporation for any reason (other than for Cause or by reason of Employee becoming Disabled), Employee shall be paid a severance payment in an amount equal to $5,000 multiplied by the number of full months that Employee has been employed by the Corporation prior to such termination, with such amount not to exceed $60,000, payable in six equal monthly installments, with the first installment being payable on the date falling two weeks after the date of such termination and each additional installment being paid every month after such date until such severance is paid in full.

(c) Paragraphs 7, 8, 9, 10, 11, 12 and 26 of this Agreement shall survive the termination of Executive's employment hereunder, except in the case of termination pursuant to Paragraph 15.

13. DISABILITY. In the event that during the term of his employment by the Corporation Executive shall become Disabled (as that term is hereinafter defined) he shall continue to receive the full amount of the base salary to which he was theretofore entitled for a period of six months after he shall be deemed to have become Disabled (the "First Disability Payment Period"). If the First Disability Payment Period shall end prior to the Termination Date, Executive thereafter shall be entitled to receive salary at an annual rate equal to 80% of his then current base salary for a further period ending on the earlier of (i) six months thereafter or (ii) the Termination Date (the "Second Disability Payment Period"). Upon the expiration of the Second Disability Payment Period, Executive shall not be entitled to receive any further payments on account of his base salary until he shall cease to be Disabled and shall have resumed his duties hereunder and provided that the Corporation shall not have theretofore terminated this Agreement as hereinafter provided. The Corporation may terminate Executive's employment hereunder at any time after Executive is

Disabled, upon at least 10 days' prior written notice; PROVIDED, HOWEVER, that such termination shall not relieve the Corporation from its obligation to make the payments to Executive described above in this Paragraph 13. For the purposes

of this Agreement, Executive shall be deemed to have become Disabled when (x) by reason of physical or mental incapacity, Executive is not able to perform his duties hereunder for a period of 90 consecutive days or for 120 days in any consecutive 180-day period and (y) Executive's physician or a physician designated by the Corporation shall have determined that it is unlikely that Executive will be able, by reason of physical or mental incapacity, to perform a substantial portion of his duties hereunder for the following 120 days. In the event that Executive shall dispute any determination of his disability pursuant to clauses (x) or (y) above, the matter shall be resolved by the determination of three physicians qualified to practice medicine in the United States of America, one to be selected by each of the Corporation and Executive and the third to be selected by the designated physicians. If Executive shall receive benefits under any disability policy maintained by the Corporation, the Corporation shall be entitled to deduct the amount equal to the benefits so received from base salary that it otherwise would have been required to pay to Executive as provided above.

14. TERMINATION FOR CAUSE. The Corporation may at any time upon written notice to Executive terminate Executive's employment for Cause. For purposes of this Agreement, the following shall constitute Cause: (i) the willful and repeated failure of Executive to perform any material duties hereunder or gross negligence of Executive in the performance of such duties, and if such failure or gross negligence is susceptible to cure by Executive, the failure to effect such cure within twenty (20) days after written notice of such failure or gross negligence is given to Executive; (ii) except as permitted hereunder, unexplained, willful and regular absences of Executive from the Corporation; (iii) excessive use of alcohol or illegal drugs, interfering with the performance of Executives duties hereunder; (iv) indictment for a crime of theft, embezzlement, fraud, misappropriation of funds, other acts of dishonesty or the violation of any law or ethical rule relating to Executive's employment; (v) indicted for any other felony or other crime involving moral turpitude by Executive; or (vi) the breach by Executive of any of the provisions of paragraphs 8, 9 or 10 and if such breach is susceptible of cure by Executive, the failure to effect such cure within twenty (20) days after written notice of such breach is given to Executive. For purposes of this Agreement, an action shall be considered "willful" if it is done intentionally, purposely or knowingly, distinguished from an act done carelessly, thoughtlessly or inadvertently. In any such event, Executive shall be entitled to receive his base salary to and including the date of termination.

15. TERMINATION BY EMPLOYEE. Executive may upon written notice to the Corporation terminate this Agreement (including paragraphs 8, 9, 10 and 11) in the event of the breach by the Corporation of any material provision of this Agreement, and if such breach is susceptible of cure, the failure to effect such cure within 20 days after written notice of such breach is given to the Corporation (an "Employer Breach"). Executive's right to terminate this Agreement under this Paragraph 15 shall be in addition to any other remedies Executive may have under law or equity. Paragraphs 7 and 12(b) of this Agreement shall survive the termination of this Agreement by Executive pursuant to this Paragraph 15.

16. INSURANCE POLICIES. The Corporation shall have the right from time to time to purchase, increase, modify or terminate insurance policies on the life of Executive for the benefit

of the Corporation, in such amounts as the Corporation shall determine in its sole discretion. In connection therewith, Executive shall, at such time or times and at such place or places as the Corporation may reasonably direct, submit himself to such physical examinations and execute and deliver such documents as the Corporation may reasonably deem necessary or desirable; PROVIDED that such examinations shall be performed by, and that such documents shall be delivered only to, qualified physicians and/or medical representatives of licensed insurance companies. At Executive's written request upon the termination of Executive's employment under this Agreement (other than for Cause or as result of Executive's death), the Corporation shall assign to Executive the Corporation's interest in such life insurance policies (to the extent such policies are so assignable by their terms), whereupon Executive shall assume all obligations of the Corporation in respect thereof. Notwithstanding anything to the contrary contained herein, the Company shall have no right to terminate this Agreement solely by reason of the Company's inability to obtain insurance policies on the life of Executive under this paragraph.

17. ENTIRE AGREEMENT; AMENDMENT. This Agreement constitutes the entire agreement of the parties hereto, and any prior agreement between the Corporation and Executive is hereby superseded and terminated effective immediately and shall be without further force or effect. No amendment or modification herself shall be valid or binding unless made in writing and signed by the party against whom enforcement thereof is sought.

18. NOTICES. Any notice required, permitted or desired to be given pursuant to any of the provisions of this Agreement shall be delivered in person or sent by responsible overnight delivery service or sent by certified mail, return receipt requested, postage and fees prepaid, if to the Corporation, at its address set forth above to the attention of the Corporation's Chief Executive Officer and, if to Executive, at his address set forth above. Either of the parties hereto may at any time and from time to time change the address to which notice shall be sent hereunder by notice to the other party given under this Paragraph 18. Notices shall be deemed effective upon receipt.

19. NO ASSIGNMENT; BINDING EFFECT. Neither this Agreement, nor the right to receive any payments hereunder, may be assigned by either party without the other party's prior written consent. This Agreement shall be binding upon Executive, his heirs, executors and administrators and upon the Corporation, its successors and assigns.

20. WAIVERS. No course of dealing nor any delay on the part of either party in exercising any rights hereunder shall operate as a waiver of any such rights. No waiver of any default or breach of this Agreement shall be deemed a continuing waiver or a waiver of any other breach or default.

21. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the laws of the State of Delaware, except that body of law relating to choice of laws.

22. INVALIDITY. If any clause, paragraph, section or part of this Agreement shall be held or declared to be void, invalid or illegal, for any reason, by any court of competent jurisdiction, such provision shall be ineffective but shall not in any way invalidate or affect any other clause, paragraph, section or part of this Agreement.

23. FURTHER ASSURANCES. Each of the parties shall execute such documents and take such other actions as may be reasonably requested by the other party to carry out the provisions and purposes of this Agreement in accordance with its terms.

24. HEADINGS. The headings contained in this Agreement have been inserted for convenience only and shall not affect in any way the meaning or interpretation of this Agreement.

25. PUBLICITY. The Corporation and Executive agree that they will not make any press releases or other announcements prior to or at the time of execution of this Agreement with respect to the terms contemplated hereby, except as required by applicable law, without the prior approval of the other party, which approval will not be unreasonably withheld.

26. ARBITRATION. Any disputes arising under this Agreement shall be submitted to and determined by arbitration in St. Louis, Missouri. Such arbitration shall be conducted in accordance with the rules of the American Arbitration Association. Any award or decision of the arbitration shall be conclusive in the absence of fraud and judgment thereon may be entered in any court having jurisdiction thereof. The costs of such arbitration shall be paid by the non-prevailing party to the extent directed by the arbitrator(s).

THIS AGREEMENT CONTAINS BINDING ARBITRATION PROVISIONS WHICH MAY BE ENFORCED BY THE PARTIES.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be duly executed as of the day and year first above written.

SHEFFIELD PHARMACEUTICALS, INC.

By: /s/ Loren G. Peterson

Loren G. Peterson
President & Chief Executive Officer

/s/ Scott A. Hoffmann

Scott A. Hoffmann

EX-10.8
3
STOCK OPTION PLAN

Exhibit 10.8

SHEFFIELD MEDICAL TECHNOLOGIES INC.

1993 STOCK OPTION PLAN
(as amended through July 15, 1998)

1. PURPOSES OF THE PLAN. The purposes of this 1993 Stock Option Plan are to attract and retain the best available personnel for positions of responsibility within the Company, to provide additional incentive to Employees of the Company, and to promote the success of the Company's business through the grant of options to purchase shares of the Company's Common Stock. Options granted hereunder may be either Incentive Stock or Non-Statutory Stock Options, at the discretion of the Board. The type of options granted shall be reflected in the terms of written Stock Option agreements. The Company intends that the Plan meet the requirements of Rule 16b-3 and that transactions of the type specified in subparagraphs (c) to (f) inclusive of Rule 16b-3 by officers and directors of the Company pursuant to the Plan will be exempt from the operation of Section 16(b) of the Exchange Act. Further, the Plan is intended to satisfy the performance-based compensation exception to the limitation on the Company's tax deductions imposed by Section 162(m) of the Code. In all cases, the terms, provisions, conditions and limitations of the Plan shall be construed and interpreted consistent with the Company's intent as stated in this Section 1.

2. DEFINITIONS. As used herein, the following definitions shall apply:

(a) "BOARD" shall mean the Board of Directors of the Company or, when appropriate, the Committee administering the Plan, if one has been appointed.

(b) "CODE" shall mean the Internal Revenue Code of 1986, as amended, and the rules and regulations promulgated thereunder.

(c) "COMMON STOCK" shall mean the common stock of the Company described in the Company's Certificate of Incorporation, as amended.

(d) "COMPANY" shall mean SHEFFIELD MEDICAL TECHNOLOGIES INC., a Delaware corporation, and shall include any parent or subsidiary corporation of the Company as defined in Sections 425(e) and (f), respectively, of the Code.

(e) "COMMITTEE" shall mean the Stock Option Committee composed of two or more directors who are Non-Employee Directors and Outside Directors and who shall be elected by and shall serve at the pleasure of the Board and shall be responsible for administering the Plan in accordance with paragraph (a) of Section 4 of the Plan.

(f) "EMPLOYEE" shall mean key employees, including salaried officers and directors and other key individuals employed by the Company. The payment of a director's fee by the Company shall not be sufficient to constitute "employment" by the Company.

(g) "EXCHANGE ACT" shall mean the Securities and Exchange Act of 1934, as amended.

(h) "FAIR MARKET VALUE" shall mean, with respect to the date a given Option is granted or exercised, the value of the Common Stock determined by the Board in such manner as it may deem equitable for

Plan purposes but, in the case of an Incentive Stock Option, no less than is required by applicable laws or regulations; provided, however, that where there is a public market for the Common Stock, the Fair Market Value per Share shall be the mean of the bid and asked prices of the Common Stock on the date of grant, as reported in the WALL STREET JOURNAL (or, if not so reported, as otherwise reported in the National Association of Securities Dealers Automated Quotation System) or, in the event the Common Stock is listed on the New York Stock Exchange or the NASDAQ Stock Market, the American Stock Exchange, the NASDAQ/National Market System, the Fair Market Value per Share shall be the closing price on such exchange on the date of grant of the Option, as reported in the WALL STREET JOURNAL.

(i) "INCENTIVE STOCK OPTION" shall mean an Option which is intended to qualify as an incentive stock option within the meaning of Section 422 of the Code.

(j) "NON-EMPLOYEE DIRECTOR" shall mean a non-employee director as defined in Rule 16b-3.

(k) "NON-STATUTORY STOCK OPTION" shall mean an Option which is not an Incentive Stock Option.

(l) "OPTION" shall mean a stock option granted under the Plan.

(m) "OPTIONED STOCK" shall mean the Common Stock subject to an Option.

(n) "OPTIONEE" shall mean an Employee of the Company who has been granted one or more Options.

(o) "OUTSIDE DIRECTOR" shall mean an outside director as defined in Section 162(m) of the Code or the rules and regulations promulgated thereunder.

(p) "PARENT" shall mean a "parent corporation," whether now or hereafter existing, as defined in Section 425(e) of the Code.

(q) "PLAN" shall mean this 1993 Stock Option Plan.

(r) "SHARE" shall mean a share of the Common Stock, as adjusted in accordance with Section 11 of the Plan.

(s) "STOCK OPTION AGREEMENT" shall mean the written agreement between the Company and the Optionee relating to the grant of an Option.

(t) "SUBSIDIARY" shall mean a "subsidiary corporation," whether now or hereafter existing, as defined in Section 425(f) of the Code.

(u) "TAX DATE" shall mean the date an Optionee is required to pay the Company an amount with respect to tax withholding obligations in connection with the exercise of an option.

3. COMMON STOCK SUBJECT TO THE PLAN. Subject to the provisions of

Section 11 of the Plan, the maximum aggregate number of shares which may be optioned and sold under the Plan is Four Million (4,000,000) Shares of Common Stock. The Shares may be authorized, but unissued, or previously issued Shares acquired by the Company and held in treasury.

If an Option should expire or become unexercisable for any reason without having been exercised in full, the unpurchased Shares covered by such Option shall, unless the Plan shall have been terminated, be available for future grants of Options. The maximum number of Shares that may be subject to options granted under the Plan to any individual in any calendar year shall not exceed 500,000 Shares and the method of counting such Shares shall conform to any requirements applicable to performance-based compensation under Section 162(m) of the Code or the rules and regulations promulgated thereunder.

4. ADMINISTRATION OF THE PLAN.

(a) PROCEDURE.

(i) The Plan shall be administered by the Board in accordance with Rule 16b-3 under the Exchange Act ("Rule 16b-3"); provided, however, that the Board may appoint a Committee to administer the Plan at any time or from time to time, and, provided further, that if the Board is not "disinterested" within the meaning of Rule 16b-3, the Plan shall be administered by a Committee in accordance with Rule 16b-3.

(ii) Once appointed, the Committee shall continue to serve until otherwise directed by the Board. From time to time the Board may increase the size of the Committee and appoint additional members thereof, remove members (with or without cause), appoint new members in substitution therefor, and fill vacancies however caused: provided, however, that at no time may any person

serve on the Committee if that person's membership would cause the Committee not to satisfy the "disinterested administration" requirements of Rule 16b-3.

(b) POWERS OF THE BOARD. Subject to the provisions of the Plan, the Board shall have the authority, in its discretion: (i) to grant Incentive Stock Options and Nonstatutory Stock Options; (ii) to determine, upon review of relevant information and in accordance with Section 2 of the Plan, the Fair Market Value of the Common Stock; (iii) to determine the exercise price per Share of Options to be granted, which exercise price shall be determined in accordance with Section 8(a) of the Plan; (iv) to determine the Employees to whom, and the time or times at which, Options shall be granted and the number of Shares to be represented by each Option; (v) to interpret the Plan; (vi) to prescribe, amend and rescind rules and regulations relating to the Plan; (vii) to determine the terms and provisions of each Option granted including, without limitation, the terms of exercise (including the period of exercisability) or forfeiture of Options granted hereunder

upon termination of the employment of an Employee; (viii) to accelerate or defer (with the consent of the Optionee) the exercise date of any Option; (ix) to authorize any person to execute on behalf of the Company any instrument required to effectuate the grant of an Option previously granted by the Board; (x) to accept or reject the election made by an Optionee pursuant to Section 17 of the Plan; and (xi) to make all other determinations deemed necessary or advisable for the administration of the Plan.

(c) EFFECT OF BOARD'S DECISION. All decisions, determinations and interpretations of the Board shall be final and binding on all Optionees and any other holders of any Options granted under the Plan.

(d) INABILITY OF COMMITTEE TO ACT. In the event that for any reason the Committee is unable to act or if the Committee at the time of any grant, award or other acquisition under the Plan of options or Shares does not consist of two or more Non-Employee Directors, then any such grant, award or other acquisition may be approved or ratified in any other manner contemplated by subparagraph (d) of Rule 16b-3.

5. ELIGIBILITY.

(a) Consistent with the Plan's purposes, Options may be granted only to Employees of the Company as determined by the Board. An Employee who has been granted an Option may, if he is otherwise eligible, be granted an additional Option or Options. Incentive Stock Options may be granted only to those Employees who meet the requirements applicable under Section 422 of the Code.

(b) Unless otherwise provided in the applicable Stock Option Agreement, all Options granted to Employees of the Company under the Plan will be subject to forfeiture until such time as the Optionee has been continuously employed by the Company for one year after the date of the grant of the Options, and may not be exercised prior to such time. At such time as the Optionee has been continuously employed by the Company for one year, the foregoing restriction shall lapse and the Optionee may exercise the Options at any time otherwise consistent with the Plan.

(c) With respect to Incentive Stock Options, the aggregate Fair Market Value (determined at the time the Incentive Stock Option is granted) of the Common Stock with respect to which Incentive Stock Options are exercisable for the first time by the employee during any calendar year (under all employee benefit plans of the Company) shall not exceed One Hundred Thousand Dollars ($100,000).

6. STOCKHOLDER APPROVAL AND EFFECTIVE DATES. The Plan became effective upon approval by the Board. No Option may be granted under the Plan after August 30, 2003 (ten years from the effective date of the Plan); provided, however that the Plan and all outstanding Options shall remain in effect until such Options have expired or until such Options are canceled.

7. TERM OF OPTION. Unless otherwise provided in the Stock Option Agreement, the term of each Option shall be five (5) years from the date of grant thereof. In no case shall the term of any Option exceed ten (10) years from the date of grant thereof. Notwithstanding the above, in the case of an Incentive Stock Option granted to an Employee who, at the time the Incentive Stock Option is granted, owns ten percent (10%) or more of the Common Stock as such amount is calculated under Section 422(b)(6) of the Code ("Ten Percent Stockholder"), the term of the Incentive Stock Option shall be five (5) years from the date of grant thereof or such shorter time as may be provided in the Stock Option Agreement. If an option granted to the Company's chief executive officer or to any of the Company's other four most highly compensated officers is intended to qualify as "performance-based" compensation under Section 162(m) of the Code, the exercise price of such option shall not be less than 100% of the Fair Market Value of a Share on the date such option is granted.

8. EXERCISE PRICE AND PAYMENT.

(a) EXERCISE PRICE. The per Share exercise price for the Shares to be issued pursuant to exercise of an Option shall be determined by the Board, but in the case of an Incentive Stock Option shall be no less than one hundred percent (100%) of the Fair Market Value per share on the date of grant, and in the case of a Nonstatutory Stock Option shall be no less than eighty-five percent (85%) of the Fair Market Value per share on the date of grant. Notwithstanding the foregoing, in the case of an Incentive Stock Option granted to an Employee who, at the time of the grant of such Incentive Stock Option, is a Ten Percent Stockholder, the per Share exercise price shall be no less than one hundred ten percent (110%) of the Fair Market Value per Share on the date of grant.

(b) PAYMENT. The price of an exercised Option and the Employee's portion of any taxes attributable to the delivery of Common Stock under the Plan, or portion thereof, shall be paid:

(i) In United States dollars in cash or by check, bank draft or money order payable to the order of the Company; or

(ii) At the discretion of the Board, through the delivery of shares of Common Stock with an aggregate Fair Market Value equal to the option price and withholding taxes, if any; or

(iii) At the election of the Optionee pursuant to Section 17 and with the consent of the Board pursuant to Section 4(b)(x), by the Company's retention of such number of shares of Common Stock subject to the exercised Option which have an aggregate Fair Market Value on the exercise date equal to the Employee's portion of the Company's aggregate federal, state, local and foreign tax withholding and FICA and FUTA obligations with respect to income generated by the exercise of the Option by Optionee;

(iv) By a combination of (i), (ii) and (iii) above; or

(v) In the manner provided in subsection (c) below.

The Board shall determine acceptable methods for tendering Common Stock as payment upon exercise of an Option and may impose such limitations and prohibitions on the use of Common Stock to exercise an Option as it deems appropriate.

(c) FINANCIAL ASSISTANCE TO OPTIONEES. The Board may assist Optionees in paying the exercise price of Options granted under this Plan in the following manner:

(i) The extension of a loan to the Optionee by the Company; or

(ii) Payment by the Optionee of the exercise price in installments; or

(iii) A guaranty by the Company of a loan obtained by the Optionee from a third party.

The terms of any loans, installment payments or guarantees, including the interest rate and terms of repayment, and collateral requirements, if any, shall be determined by the Board, in its sole discretion. Subject to applicable margin requirements, any loans, installment payments or guarantees authorized by the Board pursuant to the Plan may be granted without security, but the maximum credit available shall not exceed the exercise price for the Shares for

which the Option is to be exercised, plus any federal and state income tax liability incurred in connection with the exercise of the Option.

9. EXERCISE OF OPTION.

(a) PROCEDURE FOR EXERCISE; RIGHTS AS A STOCKHOLDER. Any Option granted hereunder shall be exercisable at such times and under such conditions as determined by the Board, including performance criteria with respect to the Company and/or the Optionee, and as shall be permissible under the terms of the Plan. Unless otherwise determined by the Board at the time of grant, an Option may be exercised in whole or in part. An Option may not be exercised for a fraction of a Share.

An Option shall be deemed to be exercised when written notice of such exercise has been given to the Company in accordance with the terms of the Option by the person entitled to exercise the Option and full payment for the Shares with respect to which the Option is exercised has been received by the company. Full payment may, as authorized by the Board, consist of any consideration and method of payment allowable under Section 8(b) of the Plan. Until the issuance (as evidenced by the appropriate entry on the books of the Company or of a duly authorized transfer agent of the Company) of the stock certificate evidencing such Shares, no right to vote or receive dividends or any other rights as a stockholder shall exist with respect to the Optioned Stock, notwithstanding the exercise of the Option. No adjustment will be made for a dividend or other right for which the record date is prior to the date the stock certificate is issued, except as provided in Section 11 of the Plan.

Exercise of an Option in any manner shall result in a decrease in the number of Shares which thereafter may be available, both for purposes of the Plan and for sale under the Option, by the number of Shares to which the Option is exercised.

(b) TERMINATION OF STATUS AS AN EMPLOYEE. Unless otherwise provided in the applicable Stock Option Agreement, if an Employee's employment by the Company is terminated for cause, then any Option held by the Employee shall be immediately canceled upon termination of employment and the Employee shall have no further rights with respect to such Option. Unless otherwise provided in the Stock Option Agreement, if an Employee's employment by the Company is terminated for reasons other than cause, and does not occur due to death or disability, then the Employee may, with the consent of the Board, for ninety (90) days after the date he ceases to be an Employee of the Company, exercise his Option to the extent that he was entitled to exercise it at the date of such termination. To the extent that he was not entitled to exercise the Option at the date of such termination, or if he does not exercise such Option (which he was entitled to exercise) within the time specified herein or in the applicable Stock Option Agreement, the Option shall terminate.

(c) DISABILITY. Unless otherwise provided in the applicable Stock Option Agreement, notwithstanding the provisions of Section 9(b) above, in the event an Employee is

unable to continue his employment with the Company as a result of his permanent and total disability (as defined in Section 22(e)(3) of the Code), he may, but only within twelve (12) months from the date of termination, exercise his Option to the extent he was entitled to exercise it at the date of such termination. To the extent that he was not entitled to exercise the Option at the date of termination, or if he does not exercise such Option (which he was entitled to exercise) within the time specified herein or in the applicable Stock Option Agreement, the Option shall terminate.

(d) DEATH. Unless otherwise provided in the Stock Option Agreement, if an Employee dies during the term of the Option and is at the time of his death an Employee of the Company who shall have been in continuous status as an Employee since the date of grant of the Option, the Option may be exercised at any time within twelve (12) months following the date of death (or such other period of time as is determined by the Board) by the Employee's estate or by a person who acquired the right to exercise the Option by bequest or inheritance, but only to the extent that an Employee was entitled to exercise the Option on the date of death. To the extent the Employee was not entitled to exercise the Option on the date of death, or if the Employee's estate, or person who acquired the right to exercise the Option by bequest or inheritance, does not exercise such Option (which he was entitled to exercise) within the time specified herein or in the applicable Stock Option Agreement, the Option shall terminate.

10. NON-TRANSFERABILITY OF OPTIONS. An Option may not be sold, pledged, assigned, hypothecated, transferred or disposed of in any manner other than by will or by the laws of descent or distribution, or pursuant to a "qualified domestic relations order" under the Code and ERISA, and may be exercised, during the lifetime of the Optionee, only by the Optionee.

11. ADJUSTMENTS UPON CHANGES IN CAPITALIZATION OR MERGER. Subject to any required action by the stockholders of the Company, the number of shares of Common Stock covered by each outstanding Option, and the number of shares of Common Stock which have been authorized for issuance under the Plan but as to which no Options have yet been granted or which have been returned to the Plan upon cancellation or expiration of an Option, as well as the price per share of Common Stock covered by each such outstanding Option, shall be proportionately adjusted for any increase or decrease in the number of issued shares of Common Stock resulting from a stock split, reverse stock split, stock dividend, combination or reclassification of the Common Stock, or any other increase or decrease in the number of issued shares of Common Stock effected without receipt of consideration by the Company; provided, however, that conversion of any convertible securities of the Company shall not be deemed to have been "effected without receipt of consideration." Such adjustment shall be made by the Board, whose determination in that respect shall be final, binding and conclusive. Except as expressly provided herein, no issuance by the company of shares of stock of any class, or securities convertible into shares of stock of any class, shall affect and no adjustment by reason thereof, shall be made with respect to the number or price of shares of Common Stock subject to an Option.

In the event of the proposed dissolution or liquidation of the Company, the Option will terminate immediately prior to the consummation of such proposed action, unless otherwise provided by the Board. The Board may, in the exercise of its sole discretion in such instances, declare that any Option shall terminate as of a date fixed by the Board and give each Optionee the right to exercise his Option as to all or any part of the Optioned Stock, including Shares as to which the Option would not otherwise be exercisable. In the event of a proposed sale of all or substantially all of the assets of the Company, or the merger of the Company with or into another corporation, the Option shall be assumed or an equivalent option shall be substituted by such successor corporation or a parent or subsidiary of such successor corporation, unless the Board determines, in the exercise of its sole discretion and in lieu of such assumption or substitution, that the Optionee shall have the right to exercise the option as to all of the Optioned Stock, including Shares as to which the Option would not otherwise be exercisable. If the Board makes an Option fully exercisable in lieu of assumption or substitution in the event of a merger of sale of assets, the Board shall notify the Optionee that the Option shall be fully exercisable for a period of sixty (60) days from the date of such notice (but not later than the expiration of the term of the Option under the Option Agreement), and the Option will terminate upon the expiration of such period.

12. TIME OF GRANTING OPTIONS. The date of grant of an Option shall, for all purposes, be the date on which the Board makes the determination granting such Option. Notice of the determination shall be given to each Employee to whom an Option is so granted within a reasonable time after the date of such grant.

13. AMENDMENT AND TERMINATION OF THE PLAN.

(a) AMENDMENT AND TERMINATION. The Board may amend or terminate the Plan from time to time in such respects as the Board may deem advisable; provided, however, that the following revisions or amendments shall require approval of the Stockholders of the Company, to the extent required by law, rule or regulation:

(i) Any material increase in the number of Shares subject to the Plan, other than in connection with an adjustment under Section 11 of the Plan;

(ii) Any material change in the designation of the Employees eligible to be granted Options; or

(iii) Any material increase in the benefits accruing to participants under the Plan.

(b) EFFECT OF AMENDMENT OR TERMINATION. Any such amendment or termination of the Plan shall not affect Options already granted and such Options shall remain in full force and effect as if this Plan had not been amended or terminated, unless

mutually agreed otherwise between the Optionee and the Board, which agreement must be in writing and signed by the Optionee and the Company.

14. CONDITIONS UPON ISSUANCE OF SHARES. Shares shall not be issued pursuant to the exercise of an Option unless the exercise of such Option and the issuance and delivery of such Shares pursuant thereto shall comply with all relevant provisions of law, including, without limitation, the Securities Act of 1933, as amended, the Exchange Act, the rules and regulations promulgated thereunder, and the requirements of any stock exchange upon which the Shares may then be listed, and shall be further subject to the approval of counsel for the Company with respect to such compliance.

As a condition to the exercise of an Option, the Company may require the person exercising such Option to represent and warrant at the time of any such exercise that the Shares are being purchased only for investment and without any present intention to sell or distribute such Shares if, in the opinion of counsel for the company, such a representation is required by any of the aforementioned relevant provisions of law.

Inability of the Company to obtain authority from any regulatory body having jurisdiction, which authority is deemed by the Company's counsel to be necessary to the lawful issuance and sale of any Shares hereunder, shall relieve the Company of any liability in respect of the failure to issue or sell such Shares as to which such requisite authority shall not have been obtained.

In the case of an Incentive Stock Option, any Optionee who disposes of Shares of Common Stock acquired upon the exercise of an Option by sale or exchange (a) either within two (2) years after the date of the grant of the Option under which the Common Stock was acquired or (b) within one (1) year after the acquisition of such Shares of Common Stock shall notify the Company of such disposition and of the amount realized upon such disposition.

15. RESERVATION OF SHARES. The Company will at all times reserve and keep available such number of Shares as shall be sufficient to satisfy the requirements of the Plan.

16. OPTION AGREEMENT. Options shall be evidenced by Stock Option Agreements in such form as the Board shall approve.

17. WITHHOLDING TAXES. Subject to Section 4(b)(x) of the Plan and prior to the Tax Date, the Optionee may make an irrevocable election to have the Company withhold from those Shares that would otherwise be received upon the exercise of any Option, a number of Shares having a Fair Market Value equal to the minimum amount necessary to satisfy the Company's federal, state, local and foreign tax withholding obligations and FICA and FUTA obligations with respect to the exercise of such Option by the Optionee.

An Optionee who is also an officer of the Company must make the above described election:

(a) at least six months after the date of grant of the Option (except in the event of death or disability); and

(b) either:

(i) six months prior to the Tax Date, or

(ii) prior to the Tax Date and during the period beginning on the third business day following the date the Company releases its quarterly or annual statement of sales and earnings and ending on the twelfth business day following such date.

18. MISCELLANEOUS PROVISIONS.

(a) PLAN EXPENSE. Any expense of administering this Plan shall be borne by the Company.

(b) USE OF EXERCISE PROCEEDS. The payment received from Optionees from the exercise of Options shall be used for the general corporate purposes of the Company.

(c) CONSTRUCTION OF PLAN. The place of administration of the Plan shall be in the State of Wyoming, and the validity, construction, interpretation, administration and effect of the Plan and of its rules and regulations, and rights relating to the Plan, shall be determined in accordance with the laws of the State of Wyoming without regard to conflict of law principles and, where applicable, in accordance with the Code.

(d) TAXES. The Company shall be entitled if necessary or desirable to pay or withhold the amount of any tax attributable to the delivery of Common Stock under the Plan from other amounts payable to the Employee after giving the person entitled to receive such Common Stock notice as far in advance as practical, and the Company may defer making delivery of such Common Stock if any such tax may be pending unless and until indemnified to its satisfaction.

(e) INDEMNIFICATION. In addition to such other rights of indemnification as they may have as members of the Board, the members of the Board shall be indemnified by the Company against all costs and expenses reasonably incurred by them in connection with any action,

suit or proceeding to which they or any of them may be party by reason of any action taken or failure to act under or in connection with the Plan or any Option, and against all amounts paid by them in settlement thereof (provided such settlement is approved by independent legal counsel selected by the Company) or paid by

them in satisfaction of a judgment in any such action, suite or proceeding, except a judgment based upon a finding of bad faith; provided that upon the institution of any such action, suit or proceeding a Board member shall, in writing, give the Company notice thereof and an opportunity, at its own expense, to handle and defend the same before such Board member undertakes to handle and defend it on her or his own behalf.

(f) GENDER. For purposes of this Plan, words used in the masculine gender shall include the feminine and neuter, and the singular shall include the plural and vice versa, as appropriate.

(g) NO EMPLOYMENT AGREEMENT. The Plan shall not confer upon any Optionee any right with respect to continuation of employment with the Company, nor shall it interfere in any way with his right or the Company's right to terminate his employment at any time.

EX-21
4
SUBSIDIARIES

EXHIBIT 21

SUBSIDIARIES OF SHEFFIELD PHARMACEUTICALS, INC.

1. Ion Pharmaceuticals, Inc., a Delaware corporation.

2. CP Pharmaceuticals, Inc., a Delaware corporation.

3. Systemic Pulmonary Delivery, Ltd., a Bermuda corporation.

EX-23
5
CONSENT OF ADITORS

EXHIBIT 23.1

CONSENT OF INDEPENDENT AUDITORS

We consent to the incorporation by reference in the Registration Statements (Form S-3 No. 33-95732, Form S-3 No. 333-27753 and Form S-3 No. 333-38327) of Sheffield Pharmaceuticals, Inc. and in the related Prospectuses, in the Registration Statement (Form S-8 No. 33-95262) pertaining to the 1993 Stock Option Plan of Sheffield Pharmaceuticals, Inc., the 1993 Restricted Stock Plan of Sheffield Pharmaceuticals, Inc. and options granted to directors, officers, employees, consultants and advisors of the Company pursuant to other employee benefit plans of Sheffield Pharmaceuticals, Inc. and in the Registration Statement (Form S-8 No. 333-14867) pertaining to the 1993 Stock Option Plan of Sheffield Pharmaceuticals, Inc., the 1996 Directors Stock Option Plan of Sheffield Pharmaceuticals, Inc. and Options granted to directors, officers, employees, consultants and advisors of the Company pursuant to other employee benefit plans of Sheffield Pharmaceuticals, Inc. of our report dated March 11, 1999, with respect to the consolidated financial statements of Sheffield Pharmaceuticals, Inc. and subsidiaries included in this Annual Report (Form 10-K) for the year ended December 31, 1998.

/s/ Ernst & Young LLP

St. Louis, Missouri
March 23, 1999

EX-27
6
FINANCIAL DATA SCHEDULE

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~~THIS SCHEDULE CONTAINS SUMMARY FINANCIAL INFORMATION EXTRACTED FROM THE CONDENSED FINANCIAL STATEMENTS FOR THE QUARTER ENDED DECEMBER 31, 1997 AND IS QUALIFIED IN ITS ENTIRETY BY REFERENCE TO SUCH STATEMENTS.~~

~~12-MOS~~
~~DEC-31-1998~~
~~DEC-31-1998~~
~~2,456,290~~
~~127,774~~
~~0~~
~~0~~
~~0~~
~~2,623,099~~
~~493,417~~
~~253,995~~
~~2,862,521~~
~~1,166,266~~
~~0~~
~~0~~
~~119~~
~~270,584~~
~~384,502~~
~~2,862,521~~
~~0~~

410,273
0
0
18,970,734
0
251,363
(18,560,461)
0
(18,560,461)
0
0
0
(18,560,461)
(.85)
(.85)

-----END PRIVACY-ENHANCED MESSAGE-----