

CYANOTECH CORP  
Form 10-K  
June 28, 2006

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**

Washington, D. C. 20549

**FORM 10-K**

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

For the Fiscal Year Ended March 31, 2006

Commission File Number 0-146-02

**CYANOTECH CORPORATION  
(Exact name of registrant as specified in its charter)**

**Nevada**  
(State or other jurisdiction of  
incorporation or organization)  
**73-4460 Queen Kaahumanu Highway, Suite 102,**  
**Kailua-Kona, Hawaii**  
(Address of principal executive offices)  
Registrant's telephone number, including area code: **(808) 326-1353**

**91-1206026**  
(I. R. S. Employer  
Identification No.)  
**96740**  
(Zip Code)

Securities registered pursuant to Section 12(b) of the Act:  
**None**

Name of each exchange on which registered:  
**NASDAQ Capital Market**

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

**Common Stock, \$.005 par value**  
(Title of Class)

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.  Yes  No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.  Yes  No

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, or a non-accelerated filer. See definition of accelerated filer and large accelerated filer in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer

Accelerated filer

Non-accelerated filer

Indicated by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act).  Yes  No

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The aggregate market value of the Registrant's Common Stock held by non-affiliates of the Registrant on June 19, 2006 was approximately \$11,425,700 based on the closing sale price of the Common Stock on the NASDAQ Capital Market on that date.

Number of shares outstanding of Registrant's Common Stock at June 19, 2006 was 20,928,265.

### **DOCUMENTS INCORPORATED BY REFERENCE**

Portions of the Registrant's Definitive Proxy Statement for its 2006 Annual Meeting of Stockholders, to be filed with the Securities and Exchange Commission on or prior to July 18, 2006 and to be used in connection with the Annual Meeting of Stockholders expected to be held on August 24, 2006, are incorporated by reference in Part III of this Form 10-K.

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## PART I

### Item 1. Business

#### General

Cyanotech Corporation is a world leader in the production of high value natural products derived from microalgae. Incorporated in 1983, the Company is guided by the principle of providing beneficial, quality microalgal products for human and animal nutrition in a sustainable, reliable and environmentally sensitive operation. We are ISO 9001:2000 compliant, reinforcing our commitment to quality in our products, to quality in our relationships (with our customers, suppliers, co-workers and the communities we live in), and to quality of the environment we work in. The Company's products include:

- *BioAstin*® natural astaxanthin is a powerful dietary antioxidant with expanding applications as a human nutraceutical and functional food ingredient, shown to support and maintain the body's natural inflammatory response, to enhance skin, muscle and joint health.
- *NatuRose*® natural astaxanthin, is used as a feed ingredient for the aquaculture feed industry, specifically providing natural pigmentation to aquaculture-raised shrimp, salmon, yellowtail tuna and tai (red sea bream), and for the animal feed industry such as in poultry feed formulations to naturally pigment the yolk of chicken eggs;
- *Spirulina Pacifica*®, is a nutrient-rich dietary supplement used for extra energy, a strengthened immune system and as a source of antioxidant carotenoids;
- Natural phycobiliproteins are highly fluorescent pigments used as tags or markers in many kinds of biological assays in the immunological diagnostics market.

Microalgae are a diverse group of microscopic plants that have a wide range of physiological and biochemical characteristics and contain, among other things, high levels of natural protein, amino acids, vitamins, pigments and enzymes. Microalgae have the following properties that make commercial production attractive: (1) microalgae grow much faster than land grown plants, often up to 100 times faster; (2) microalgae have uniform cell structure with no bark, stems, branches or leaves, permitting easier extraction of products and higher utilization of the microalgae cells; and (3) the cellular uniformity of microalgae makes it practical to manipulate and control growing conditions in order to optimize a particular cell characteristic. Efficient cultivation of microalgae requires consistent light, warm temperature, low rainfall and proper chemical balance in a very nutrient-rich environment. If the chemical composition of a pond changes from its required balance, contamination can occur from the growth of unwanted organisms.

Since 1983, we have designed, developed and implemented proprietary production and harvesting technologies, systems and processes, thereby eliminating many of the stability and contamination problems frequently encountered in the production of microalgae. Our production of these products at the 90-acre facility on the Kona Coast of Hawaii provides significant advantages. We selected the Keahole Point location in order to take advantage of the consistent warm temperatures, abundant sunshine and low levels of rainfall needed for optimal cultivation of microalgae. This location also offers us access to cold deep ocean water, drawn from an offshore depth of 2,000 feet, which we use in our patented *Ocean-Chill Drying* system to eliminate the oxidative damage caused by standard drying techniques and as a source of trace nutrients for microalgal cultures. We believe that our technology, systems, processes and favorable growing location permit year-round harvest of our microalgal products in a cost-effective manner.

Unless otherwise indicated, all references in this report to the Company, we, us, our, and Cyanotech refer to Cyanotech Corporation and its wholly owned subsidiaries, Nutrex Hawaii, Inc. ( Nutrex Hawaii or Nutrex ), a Hawaii corporation, and Cyanotech Japan YK ( Cyanotech Japan or CJYK ), a Japan corporation.

**Cyanotech's Business**

The Company operates entirely in one operating segment, the cultivation and production of microalgae into high-value, high-quality natural products. The Company cultivates, on a large-scale basis, two microalgal species from which our two major product lines, spirulina products and natural astaxanthin products, are derived. Cyanotech records revenue and cost of sales information by product category but does not record operating expenses by such product category. The following table sets forth, for the three years ended March 31, 2006, the net sales contributed by each of the Company's product lines (in thousands):

	Net Sales		
	2006	2005	2004
<b>Spirulina products:</b>			
<i>Spirulina Pacifica</i>	\$ 6,517	\$ 6,626	\$ 6,511
<b>Natural astaxanthin products:</b>			
<i>NatuRose</i>	1,403	1,817	2,545
<i>BioAstin</i>	2,967	2,855	2,388
Other including phycobiliproteins	244	147	138
<b>Total</b>	<b>\$ 11,131</b>	<b>\$ 11,445</b>	<b>\$ 11,582</b>

***Spirulina Products***

Since 1985, Cyanotech has been producing a strain of spirulina microalgae marketed as *Spirulina Pacifica*. Accounting for 59%, 58% and 56% of net sales for the years ended March 31, 2006, 2005, and 2004, respectively, *Spirulina Pacifica* provides a vegetable-based, highly absorbable source of protein, natural beta-carotene, mixed carotenoids, B vitamins, gamma linolenic acid, essential amino acids and other phytonutrients.

*Spirulina Pacifica* is produced in three forms: powder, flake and tablets. Powder is used as an ingredient in nutritional supplements and health food drinks while flakes are used as a seasoning on various foods. Tablets are consumed as a daily dietary supplement. All three forms are sold as raw material in bulk quantities and as packaged consumer products under the Nutrex Hawaii label.

Beginning in 1994, we have produced two grades of *Spirulina Pacifica*: an all-natural grade cultivated by using conventional agricultural fertilizers and an organic grade that is cultivated using only organic fertilizers. Our organic *Spirulina Pacifica* was grown and processed in accordance with the National Organic Program of the United States Department of Agriculture (USDA) effective October 2002. Prior to the establishment of the USDA organic standard, our organic standard was the California Organic Food Act of 1990. Our organic cultivation and processing methods were certified annually by Quality Assurance International of San Diego, California, a leading third-party agency. In its 2002 decision, the USDA National Organics Standards Board (NOSB) allowed the use of certain fertilizers in organic Spirulina cultivation through October 2005, after which all cultivators must find alternate sources of key nutrients in order to retain organic certification. The Company determined that although alternative fertilizers exist, their costs are prohibitive and their use would lead to lower quality Spirulina products. Other cultivators in the United States have reached similar conclusions. The USDA-NOSB did not extend the use of certain fertilizers for organic Spirulina cultivation at its October 2005 meeting and the Company discontinued cultivating organic Spirulina and has converted all Spirulina cultivation to all natural. The Company does not expect this decision to have a material effect on overall sales of our Spirulina Pacifica products. The Company's all natural *Spirulina Pacifica* is certified Kosher by Organized Kashrus Laboratories of Brooklyn, New York and is cultivated without the use of herbicides or pesticides.

In March 2003, Cyanotech and Earthrise Nutritionals, Inc. of Petaluma, California submitted a joint notice to the United States Food and Drug Administration (FDA) reporting their determination, through scientific procedures, that the spirulina cultivated by both companies is GRAS (generally

recognized as safe) for addition to a variety of foods. In November 2003, the FDA concluded the notification procedure by written response that it had no questions about the company's determination that spirulina is GRAS for addition to a variety of foods.

Our *Spirulina Pacifica* is cultivated in a combination of fresh water and a metered amount of nutrient-rich deep ocean water (containing essential trace elements), drawn from a depth of 2,000 feet below sea level. This water mixture is supplemented with the other major required nutrients such as sodium bicarbonate (baking soda) and infused with carbon dioxide. With the exception of deep ocean water, the raw materials and nutrients required in our Spirulina production are available from multiple sources; however, there can be no assurance that the pricing from a new source will be comparable to current pricing. In the case of deep ocean water, although abundantly available at this location, the facility to pump and deliver the water to the Company is owned by the State of Hawaii. The facility is constructed of two separately located pump stations providing redundancy should one station fail. The State of Hawaii sets the price for deep ocean water annually based on its cost to deliver the water. If the pricing for a critical raw material or nutrient significantly increases, this could have a material adverse effect on our business, financial condition and results of operations. The ability of the Company's suppliers to meet performance and quality specifications and delivery schedules is also important to operations.

Continuing the production process, the Spirulina crop in each pond is circulated by paddlewheels to keep an even blend of nutrients in suspension and a uniform exposure of the algae to sunlight. Our ponds are engineered to maintain the right media depth for sunlight to permeate each crop completely, facilitating rapid growth. The design of our cultivation ponds promotes efficient growing conditions, allowing the *Spirulina Pacifica* algae to reproduce rapidly. Each pond can be harvested, on average, in six days. As sunlight is a major component of cultivation, production can be impacted from seasonality changes during the winter months, with shortened daylight hours and potential inclement weather.

Once ready for harvest, some 70% of the Spirulina algae is pumped from a pond through underground pipes to our processing building where the crop is separated from the culture media by stainless steel screens. The remaining culture serves as an inoculum for the next growth cycle. Harvested Spirulina is washed with fresh water and vacuum filtered before moving to the drying stage. Culture media separated from Spirulina algae during processing is conserved and recycled. Recycled media is refortified with nutrients before being returned to the culture ponds for another cycle of cultivation. Our *Integrated Culture Biology Management* (ICBM) technology for microalgae cultivation has proven to be a reliable and stable operating environment, allowing us to grow and harvest Spirulina without significant contamination by unwanted microorganisms and without associated loss of productivity.

*Spirulina Pacifica* powder is dried via our patented low-oxygen *Ocean-Chill Drying* process, thereby preserving high levels of antioxidant carotenoids and other nutrients sensitive to heat and oxygen. This process also allows us to recover carbon dioxide from our drying system gas to be reused as a raw material back in our growing ponds. The drying process takes about six seconds and results in a dark green powder. Spirulina powder is difficult to form into tablets. Most tablet manufacturers either add high amounts (from 10% to 30%) of inert substances to glue the tablet together or use a heat granulation process that destroys nutrients. In contrast, our *Spirulina Pacifica* tablets contain a maximum of 2% of such substances and are produced in cold press compression tablet-making machines. Our *Spirulina Pacifica* flakes are produced by combining freshly harvested *Spirulina Pacifica* with food-grade lecithin and drying this blend in a proprietary system.

Each production lot of *Spirulina Pacifica* is sampled and subjected to thorough quality control analyses including testing for moisture, carotenoids, minerals, color and taste, among others. Further, each lot of our *Spirulina Pacifica* undergoes a prescribed set of microbiological food product tests, including total aerobic bacteria, coliform bacteria and E. coli. The *Spirulina Pacifica* powder, tablets and flakes are vacuum-sealed in oxygen-barrier foil laminate bags along with a packet of oxygen absorbent. This

packaging ensures product freshness and extends the shelf life of bulk *Spirulina Pacifica* products. The Company's packaged consumer products are bottled and labeled by two contractors in California. These contractors are Kosher certified and subject to regular government inspections. Such packaging services are readily available from multiple sources.

The majority of our bulk *Spirulina* sales are to health food manufacturers and formulators with their own *Spirulina* product lines, many of whom identify and promote Cyanotech's Hawaiian *Spirulina Pacifica* in their products. Such customers purchase bulk powder or bulk tablets and package these products under their brand label for sale to the health and natural food markets. Many of the brands produced by these customers are marketed and sold domestically in direct competition with the packaged consumer products sold through our Nutrex Hawaii subsidiary. Nutrex Hawaii packaged consumer products are sold through an established health food distribution network in the domestic market and shipped through one of our wholesale distributors. In selected foreign markets, we have exclusive sales distributors for both our bulk and packaged consumer products.

Our *Spirulina Pacifica* products compete with a variety of vitamins, dietary supplements, other algal products and similar nutritional products available to consumers. The nutritional products market is highly competitive and includes international, national, regional and local producers and distributors, many of whom have greater resources than Cyanotech and many of whom offer a greater variety of products. Our direct competition in the *Spirulina* market is currently from Dainippon Ink and Chemical Company's Earthrise facility in California and several farms in China. Other competitors include numerous smaller farms in China, India, Thailand, Taiwan, Cuba, South Africa and South America. The market for *Spirulina* is mature with slow growth expected in future periods. In this mature market, the Company has experienced increased price competition due to more *Spirulina* suppliers as well as a larger portion of sales coming from bulk product orders whose customers generally treat these products as commodities with price being the major determining factor driving their purchasing decision. As one of the largest producers of *Spirulina*, our challenge is to increase our market share among customers who seek the high-quality products we produce while concurrently adjusting our product mix to meet our revenue targets.

As of March 31, 2006, the backlog of orders for all *Spirulina* products totaled approximately \$448,000 and such orders are expected to be filled in the first quarter of fiscal 2007. Such backlogs at the end of fiscal 2005 and 2004 were \$661,000 and \$334,000 respectively.

#### ***Natural Astaxanthin Products***

The Company commenced commercial production of natural astaxanthin in early 1997 with the introduction of *NatuRose* to the aquaculture market. Astaxanthin is a red pigment used in the aquaculture market primarily to impart a pink to red color to the flesh of commercially raised fish and shrimp but also has been found to be essential for their proper growth and survival. Since its introduction, several feeding trials have been performed by our customers and potential customers that prove the efficacy of *NatuRose* as an alternative to the petrochemical-based synthetic astaxanthin presently used by most aquaculture companies. The appeal of our product is that it is derived from a natural source and produces results that are comparable, or in some cases superior, to synthetic astaxanthin. Sold in bulk quantities as a powder, *NatuRose* sales accounted for 13%, 16% and 22% of net sales for the years ended March 31, 2006, 2005 and 2004, respectively.

In 1999, our natural astaxanthin product for the human nutrition market, *BioAstin*, was introduced. *BioAstin* sales accounted for 27%, 25% and 21% of net sales for the years ended March 31, 2006, 2005 and 2004, respectively. *BioAstin* is produced in three forms: a liquid lipid extract, gelcaps and microencapsulated beadlets with all three forms sold in bulk quantities. *BioAstin* gelcaps are also sold in packaged consumer form under the Nutrex Hawaii label. A growing body of scientific literature is suggesting that the beneficial antioxidant properties of natural astaxanthin may surpass many of the antioxidant properties of vitamin C, vitamin E, beta-carotene and other carotenoids. Independent

scientific studies indicate that in certain models, natural astaxanthin has up to 550 times the antioxidant activity of vitamin E and 10 times the antioxidant activity of beta-carotene.

The Company produces natural astaxanthin from *Haematococcus pluvialis* microalgae grown in fresh water supplemented with nutrients. As these algae are extremely susceptible to contamination by unwanted algae, protozoa and amoebae, the Company developed a proprietary system known as the *PhytoDome Closed Culture System* or *PhytoDome CCS* to overcome this problem. Using these large-scale photobioreactors, we are able to grow consistently large volumes of contaminant-free *Haematococcus* culture. Raw materials and nutrients for our natural astaxanthin production share the same sourcing constraints and pricing risks as those existing in our Spirulina production. Fresh water is critical to the production of our natural astaxanthin and is supplied by the County of Hawaii. While the Company has not experienced any constraint on fresh water availability to date, availability could be impacted by a significant population growth in the region as well as throughput constraints on the water delivery infrastructure. The Company has met with officials of the County of Hawaii to assess the fresh water situation and evaluate the probability of future risks. The Company recycles fresh water in its production process where possible and continues to explore further recycling opportunities. However, there is no guarantee that these efforts will result in significant changes to our fresh water utilization.

For the final stage of cultivation, the *Haematococcus* algae is transferred to open ponds where an environmental stress is applied causing the algae to form spores which accumulate high levels of astaxanthin. Once ready for harvest, the media containing these spores is transported through underground pipes to our astaxanthin processing building where the culture media and algal spores are separated. Fresh water recovered from this stage of processing may be recycled for further use in cultivation. The harvested algal spores are dried to a fine powder. During processing, the spores are cracked in a proprietary system to assure high bioavailability of astaxanthin. Each production lot of astaxanthin is sampled and tested for astaxanthin concentration. Finally the bulk powder is vacuum-sealed in oxygen-barrier foil laminate bags along with a packet of oxygen absorbent.

Unlike Spirulina, astaxanthin is produced in a batch-mode and each cultivation pond must be completely drained and thoroughly cleaned between cycles. While the entire astaxanthin production cycle takes a total of four weeks, each stage of the four-step process is staggered and continuously feeds the next stage of cultivation. As a result, we are currently able to produce a new crop of astaxanthin from each of our 500,000 liter culture ponds approximately once per week. Pond cultivation can be negatively impacted seasonally with shortened daylight hours and potential inclement weather in winter months.

Natural astaxanthin for human consumption is processed further utilizing a high-pressure extraction process. The resulting product is a lipid extract insoluble in water used for the production of gelcaps. This product can also be micro-encapsulated into beadlets which our customers use in other formulations. All natural astaxanthin products destined for human consumption undergo a prescribed set of microbiological food product tests to ensure safety and quality. The Company uses third party contractors for the extraction services, the production of gelcaps and the production of beadlets. Although these services are available only from a limited number of sources, we have the ability to use other parties if any of the current contractors become unavailable; however, there is no assurance that the pricing from a new contractor will be comparable to current negotiated pricing. In addition, a new contractor would have to pass the Company's qualification process ensuring quality standards can be met or exceeded. If the pricing, for any of these services, significantly increases, this could have a material adverse effect on our business, financial condition and results of operations.

*NatuRose* is sold through a network of agents and distributors primarily to feed manufacturers and farmers in the aquaculture industry. Japan is one of our primary markets for the application of *NatuRose* in aquaculture and was a major factor in our decision to establish CJYK as a channel of distribution. In addition, *NatuRose* is sold to poultry feed formulators as a natural pigment for the yolk of chicken eggs and

also to formulators of feeds for commercial breeding of high-value tropical fish. As our product is a natural astaxanthin, many of these formulators identify *NatuRose* by name as a component of their feed.

The animal nutrition astaxanthin market is currently dominated by Royal DSM of the Netherlands ( Royal DSM ). Royal DSM purchased F. Hoffmann-LaRoche's division of vitamins and fine chemicals, including their synthetic astaxanthin operation, in 2003. *NatuRose* competes with the synthetic astaxanthin products derived from petrochemicals as well as other natural astaxanthin products derived from other natural sources such as *Phaffia* yeast and *Paracoccus* bacteria. Although synthetic astaxanthin has widespread use as a pigmentation source in commercial aquaculture, independent scientific analysis and feeding trials have shown that the molecular structure of the astaxanthin derived from the *Haematococcus* microalga more closely resembles the astaxanthin obtained naturally by fish in the wild. With the continued growth in the world aquaculture industry and the growing propensity towards natural alternatives, we believe *NatuRose* can compete against other products on the basis of its natural state, performance and price.

While the positive effects of astaxanthin in aquaculture have been recognized for years, the potential benefits of astaxanthin to human health are still emerging. As natural astaxanthin is one of the most potent and bioactive biological antioxidants found in nature, the number of potential roles of natural astaxanthin for human health is growing. Much research has been published in recent years on the beneficial roles of antioxidants in our health, in the aging process and on specific health conditions. The full efficacy of *BioAstin* as a human nutraceutical supplement requires further significant clinical study. The Company, to contain costs, did not spend significant amounts on clinical trials over the past two fiscal years. Independent antioxidant research and prior clinical trials show promising human applications. The Company holds three United States patents relating to the usage of *BioAstin* in the treatment of Carpal Tunnel Syndrome, the treatment of canker/cold sores and for its use as a topical and oral sunscreen.

*BioAstin* is sold in liquid lipid form as a raw ingredient to dietary supplement manufacturers, health food formulators and cosmetic manufacturers and *BioAstin* gelpcaps and beadlets are sold in bulk quantities to distributors. *BioAstin* gelpcaps are also sold as a packaged consumer product through Nutrex Hawaii directly to natural product distributors, retailers and consumers. *BioAstin* competes directly with similar products marketed by other manufacturers including Fuji Chemical of Japan, Algatechnologies of Israel, and Valensa (formally U.S. Nutraceuticals), and Mera Pharmaceuticals in the United States. In the general category of nutritional supplements, *BioAstin* also competes with a variety of vitamins, dietary supplements and other antioxidant products available to consumers. The nutritional products market is highly competitive and includes international, national, regional and local producers and distributors, many of whom have greater resources than Cyanotech and many of whom offer a greater variety of products.

As of March 31, 2006, the backlog of orders for all Natural Astaxanthin products totaled approximately \$257,000 and such orders are expected to be filled in the first quarter of fiscal 2007. Such backlogs at the end of fiscal 2005 and 2004 were \$74,000 and \$389,000, respectively.

### ***Phycobiliprotein Products***

The Company also produces phycobiliproteins for sale to the medical and biotechnology research industries. Phycobiliproteins are highly fluorescent pigments derived from microalgae. Their spectral properties make them useful as tags or markers in many kinds of biological assays, such as flow cytometry, fluorescence immunoassays and fluorescence microscopy. We do not anticipate that phycobiliproteins will represent a significant component of total sales in future periods.

### **Major Customers**

Approximately \$1,285,000 or 12% of net sales for the year ended March 31, 2006 were to Spirulina International B. V., a Spirulina marketing and distribution company based in the Netherlands. Sales to

this customer amounted to \$1,130,000 or 10% of net sales for the fiscal year 2005 and \$1,560,000 or 13% of net sales for the fiscal year 2004. We believe that sales to this customer will continue to represent a significant portion of total net sales in future periods and any significant reduction in demand from this customer could have a material adverse effect on our business, financial condition and results of operations.

### **Research and Development**

Cyanotech's expertise is in the development of efficient, stable and cost-effective production systems for microalgal products. Our researchers investigate each specific microalga identified in the scientific literature for potentially marketable products and then strive to develop the technology to grow such microalgae on a commercial scale. Successful microalgal product development is highly uncertain and is dependent on numerous factors, many beyond the Company's control. Products that appear promising in early phases of development may be found to be ineffective, may be uneconomical because of manufacturing costs or other factors, may be precluded from commercialization due to the proprietary rights of other companies, or may fail to receive necessary regulatory approvals.

The Company had research and development expenditures of \$192,000, \$257,000 and \$149,000 in fiscal years 2006, 2005 and fiscal 2004, respectively. The Company reduced investment in scientific clinical trials during the first two quarters of fisca