NORTH CAROLINA
BIOTECHNOLOGY CENTER

2001 Annual Report

CONTENTS

Biotechnology and us

Look around North Carolina, and you'll see biotechnology at work. A patient in Asheville takes human insulin to manage her diabetes. In Charlotte a homemaker cleans her children's clothes with a laundry detergent containing stain-cutting enzymes produced by genetically engineered microbes. A boy in Greensboro with hemophilia takes a blood-clotting drug to control his bleeding disorder. In Elizabeth City, a farmer plants genetically engineered corn that resists a destructive pest. A heart patient in Durham monitors his cholesterol with a quick diagnostic test. And in Wilmington, a cargo ship uses a bacterial bioreactor to clean its oily bilge water.

All of these products, developed or made in North Carolina, are improving our daily lives and our economy. Many more products are on the way. Company and university researchers throughout the state are using biotechnology to develop more nutritious foods, new drugs and diagnostics, more productive livestock, hardier crop plants, better ways to detect and clean up pollution, improved household products, and more efficient industrial processes.

What is this powerful new technology that brings us these benefits? Contrary to its name, biotechnology is not a single technology but a collection of new technologies bound by a common thread: they all use living cells and the molecules within them to make new products, improve existing products, and solve problems. Major techniques of biotechnology include genetic engineering, monoclonal antibody technology, bioprocessing, and cell and tissue culture. Using these and other technologies drawn from genetics, immunology, biochemistry, microbiology, molecular biology and other life sciences, researchers are able to improve the health, traits and products of organisms for our benefit.

The idea of intervening in the natural world to improve our lives is not new. We've been doing it since the dawn of civilization. Ten thousand years ago, our quest for a reliable supply of food and fiber led us to begin selectively breeding plants and animals for superior offspring, and to use microbes such as bacteria and fungi to make cheese, wine and bread. In the last century we learned to use viruses and bacteria to make vaccines and antibiotics, microbial enzymes to make detergent and food additives, and bacteria to treat sewage and other waste.

Today, modern biotechnology is our latest set of tools for working with nature to improve our quality of life. These tools sprang from advances in our understanding of cellular and molecular biology — including DNA, the "master" molecule — in the 1960s and 70s. Until then, most of our manipulations involved whole organisms. Today we can alter organisms at the cellular and molecular levels. This leap in understanding gives us the ability to enhance the health, traits and products of organisms with greater precision and predictability than ever before.

The applications of biotechnology are so broad, and the advantages so compelling, that most industries are adopting the technology, including the mainstays of North Carolina's economy: plant and animal agriculture, pharmaceuticals, diagnostics, textiles, aquaculture, forestry, chemicals, household products, manufacturing, environmental cleanup, food processing and forensics, to name a few.

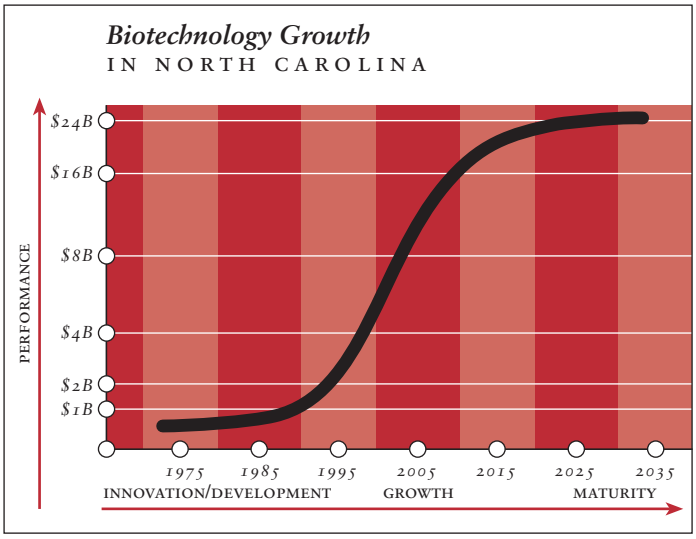
We are beginning to see the benefits in the foods we eat, the clothes we wear, the medicines we take, the environment we live in, and the jobs we take.

BIOTECHNOLOGY:

the use of living cells and their molecules to make products or solve problems.

BIOTECHNOLOGY
A Natural Fit for North Carolina

North Carolina is well suited to gain from biotechnology. Its traditional industries — especially agriculture, food and medicine — are the very ones that biotechnology can most enhance. North Carolina also has the necessary resources to develop biotechnology, including a tradition of technological development, two large research parks, leading research universities, four medical schools, major federal research labs, a progressive business climate, long-term governmental support, an extensive community college system, a highly trained work force, abundant natural resources and the nation's first state-sponsored biotechnology center.



After two decades of research, development and innovation, North Carolina's biotechnology industry is maturing into a product-manufacturing enterprise. During the next 25 years the industry is projected to grow 10- to 15-fold, generating annual product sales of up to $24 billion and employing as many as 125,000 North Carolinians in high-paying jobs.

North Carolina is home to the South's largest and most dynamic biotechnology industry and is among the country's top five biotechnology states. More than 135 companies work in biotechnology and related biosciences, about 70 companies provide contract research and testing services to the industry, and another 150-plus companies provide goods and services to these companies. North Carolina's biotechnology industry employs about 30,000 people, representing a payroll of well over $1 billion, and generates annual product sales of more than $2 billion.

Even greater returns await us. As the industry matures, it is moving from a research-and-development enterprise to a product-manufacturing endeavor. This transition is yielding beneficial new products, generating thousands of new jobs and driving industry growth of 10 to 15 percent a year. Within the next 25 years, biotechnology and related bioscience technologies are projected to generate $24 billion in annual product sales and employ 125,000 people in North Carolina.

THE NORTH CAROLINA BIOTECHNOLOGY CENTER

A Catalyst for Economic Development

When biotechnology began crystallizing into a new industry in the 1970s, leaders in North Carolina paid attention. They realized that this new technology could bring substantial economic and societal benefits to the state. Wanting North Carolina to be at the forefront of this new industry, the State in 1981 created an organization to stimulate the development of biotechnology: the North Carolina Biotechnology Center, the nation's first state-sponsored biotechnology initiative.

Initially a part of state government, the Center was reconstituted in 1984 as a private, non-profit corporation, giving it greater flexibility. As a neutral, non-partisan organization, the Center is well positioned to catalyze interactions among industry, academia and government for technological development. Working with these groups, the Center is active at all points in the movement of biotechnology from the laboratory to the market.

The Center's mission is to provide long-term economic benefit to North Carolina through support of biotechnology research, development and commercialization statewide. A 50-member staff works toward five goals:

- strengthen North Carolina's research capabilities in its academic and industrial institutions
- foster North Carolina's industrial development
- inform and educate the public about biotechnology
- develop mutually beneficial partnerships among all parties involved in moving biotechnology from research to commercialization
- establish for North Carolina a leadership role in biotechnology and its commercialization.

Unlike many biotechnology initiatives in other states, the Center does not conduct laboratory research. Instead, it works to strengthen the research capabilities of North Carolina's companies and universities. This strategy avoids duplication of effort and uses limited resources more efficiently.

The Center is funded mainly by the North Carolina General Assembly, which appropriated $8.6 million for Center programs and activities in the 2001 fiscal year.

The Center is located in an award-winning 40,000-square-foot headquarters building at 15 T.W. Alexander Drive in Research Triangle Park.

For more information about the Center and the state's biotechnology community, visit the Center online at *www.ncbiotech.org*.

Message from the President and Chairwoman

The use of biotechnology to produce new products is involving a wide array of bioscience-related industries and is growing at an exponential rate. The Center takes pride in staying ahead of this growth curve by providing our clients with forward-looking programs that anticipate their needs.


HAMNER

This year we established the Institute of Forest Biotechnology following 18 months of study and deliberation by an expert advisory committee. Trees are of prime importance to our culture, our environment and our economy. Therefore, forest biotechnology must be developed carefully with attention to ecological and social issues. The Institute is a non-profit organization that will work for societal, ecological and economic benefits from forest biotechnology worldwide. It will do so through partnerships with more than a dozen forest product companies, several national research universities including North Carolina State University, and public interest groups.

Anticipating the completion of the Human Genome Project and recognizing the rapid pace of developments in informatics, proteomics and structural biology, the Center formed the North Carolina Genomics and Bioinformatics Consortium in 2000. The Consortium's goal is to put North Carolina at the forefront of genomics, proteomics and bioinformatics research and business by planning strategic research and development initiatives, strengthening infrastructure, and building a cohesive community. The Consortium's growing membership includes more than 40 companies, 14 public and private universities and a dozen governmental research laboratories and non-profit service organizations, including the North Carolina Supercomputing Center and the National Humanities Center.

The return on investment in genomics, proteomics and bioinformatics will be substantial and long-term. These technologies will result in more nutritious and better quality food, earlier and more accurate diagnosis of diseases and conditions, new pharmaceuticals for cancer, metabolic diseases and systemic disorders, and more environmentally friendly processes for chemicals, waste disposal and manufacturing. They will provide a big boost for rural areas with value-added crops and bioprocess manufacturing plants to harvest the products of those crops. The Consortium is being created at a strategically important time to help accelerate the delivery of these benefits.


BOND

We are also very proud of the success of our BioWork program, a joint effort with the community colleges and industrial partners to train a work force for biomanufacturing jobs. With the help of Novozymes and other corporations, a new bioprocess technician training course was established at Vance-Granville Community College. The initial class was so popular that additional classes had to be created to meet student demand. We now have assisted chemical/pharmaceutical training programs at eight community colleges across the state.

While the new programs described above keep us at the forefront of new developments in biotechnology, we continue to operate our ongoing programs that strengthen the state's biotechnology resources. These programs support applied research and development at the universities, fund start-up companies, develop workforce training programs for expansion of large corporations, and prepare high school teachers how to teach about biotechnology. They are essential to the state's biotechnology infrastructure, which makes North Carolina one of the nation's most desirable places for biotechnology research and business.

We are fortunate to have an experienced Board of Directors and dedicated professional staff to manage the change that accompanies rapid growth. The North Carolina General Assembly has continued to support our programs, realizing the long-term economic benefits of investing in biotechnology development. With genomics, proteomics and bioinformatics on the horizon and the movement of biotechnology into the rural agricultural areas of our state, North Carolinians will receive increasing economic and social benefits from this technology in the years ahead.

Dr. Charles E. Hamner
President and CEO
North Carolina Biotechnology Center

Dr. Enriqueta C. Bond
President
The Burroughs Wellcome Fund

ACCOMPLISHMENTS

Core Programs and Services

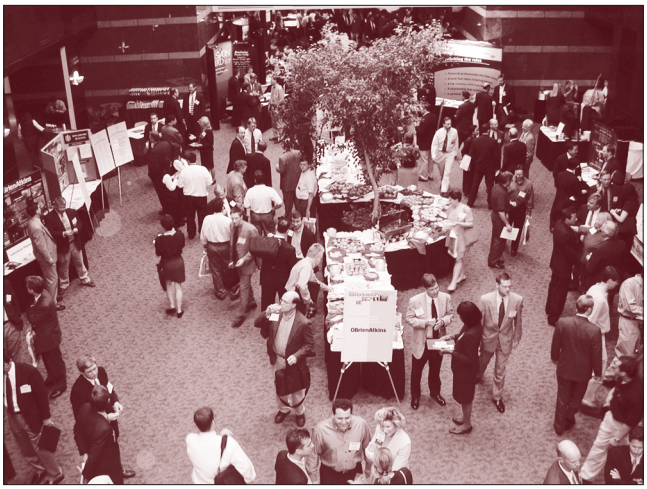
The movement of biotechnology from the mind to the marketplace is a long and complex journey that begins with ideas and ends with commercial products. The Center works at all points along the way to expedite the development and commercialization of biotechnology. Its core programs and services strengthen biotechnology research, business and education, and its special initiatives seize unique opportunities in biotechnology.

Following are accomplishments of the Center's core programs and services in 2001.

Science and Technology Development

The Science and Technology Development Program strengthens the biotechnology research capabilities of North Carolina's universities through grants, intellectual exchange programs and databases of research facilities and faculty. This year, the Program:

- awarded 17 grants totaling $1,714,486 to help six North Carolina universities recruit two outstanding faculty and acquire multi-user research facilities and equipment. These awards, made through the Institutional Development Grants Program, are listed on page 13.
- awarded 18 university grants totaling $987,783 to initiate innovative research projects with commercial potential. These awards, made through the Academic Research Initiation Grants Program, are listed on page 14.
- awarded $330,000 to support research collaborations between six biotechnology-related companies and three universities and medical centers. The funding was provided by the Collaborative Funding Assistance Program, cosponsored by the Kenan Institute for Engineering, Technology and Science. These awards are listed on page 12.
- awarded a $176,900 grant for multidisciplinary research at Duke University. The award, made through the Multidisciplinary Research Grants Program, is listed on page 14.
- supported more than a dozen conferences, symposia and workshops on the scientific aspects of biotechnology. These awards, made through the Biotechnology Event Sponsorships Program, are listed on page 16.
- supported five intellectual-exchange organizations: the North Carolina Plant Molecular Biology Consortium, the North Carolina RNA Society, the Triangle Virology Association, the Smaller Eukaryotes Group, and the Biochemistry and Enzymology Group.



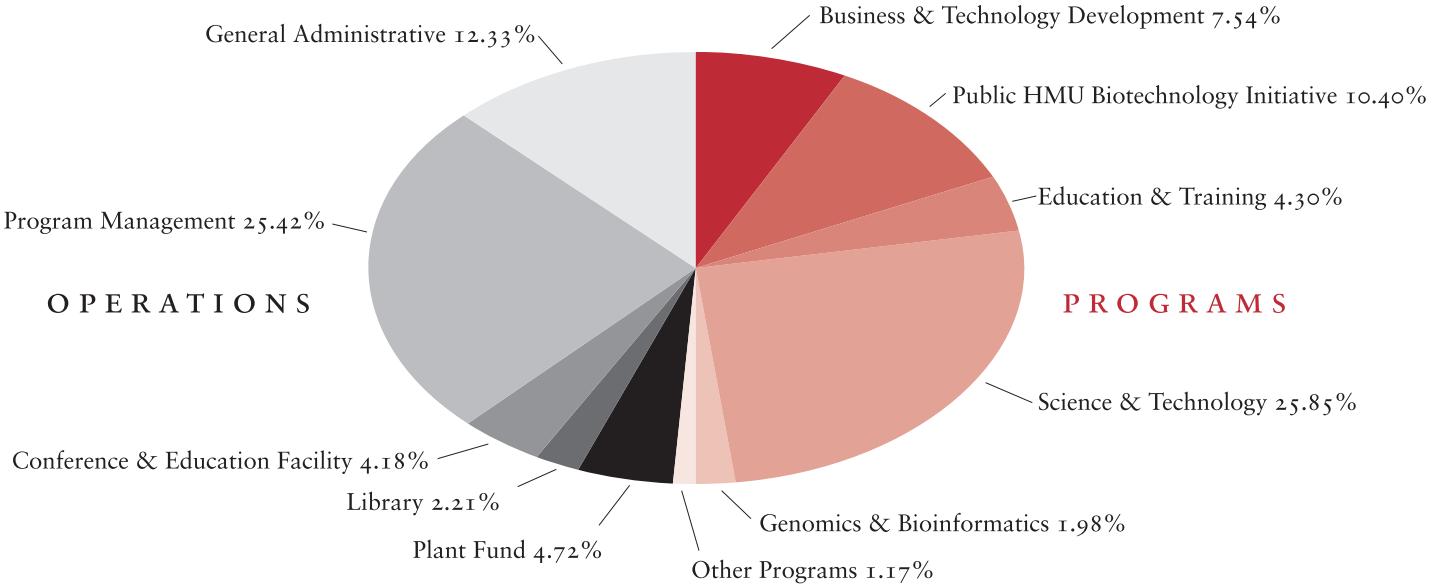
Record attendance at Biotech 2001: About 900 people attended Biotech 2001, the annual meeting of North Carolina's biotechnology community. The daylong event, held May 21 in Chapel Hill, was sponsored by the Center and the Council for Entrepreneurial Development. It featured company exhibits, panel discussions, networking opportunities, and a keynote address by David Stout, new president of GlaxoSmithKline.

Business and Technology Development

The Business and Technology Development Program helps biotechnology companies with financing, technology assessment, technology transfer, business plans, networking opportunities, venture capital placements, marketing strategies, strategic partnerships, site locations and professional referrals. This year, the Program:

- provided loans totaling $748,800 to six young biotechnology companies for product research and development. These awards, provided through the Small Business Research Award Program, are listed on page 12.
- awarded loans totaling $38,970 to help four young biotechnology companies with their business-development activities. These loans, provided through the Business Development Award Program, are listed on page 12.

2001 Program and Operations Expenditures



- awarded one loan for $75,000 to help a small biotechnology company continue its product research between funding phases of the federal government's Small Business Innovative Research Program. The loan, provided through the SBIR Bridge Fund Program, is listed on page 12.
- provided $25,000 to help a North Carolina State University scientist determine the commercial feasibility of a research project for possible licensing to a North Carolina biotechnology company. The award, provided by the Proof of Principle Awards Program, is listed on page 12.
- Provided grants to support biotechnology business events including the Venture 2001 venture capital conference in Chapel Hill, the Connectivity 2001 exposition in Winston-Salem, the Southeastern BIO Investor Forum 2000 in Chapel Hill and a six-hour seminar for biotechnology executives on general ethical, legal and societal issues facing the bioscience industry. These grants, provided through the Biotechnology Event Sponsorships Program and Program Initiative Grants, are listed on pages 16 and 17 respectively.
- cosponsored Biotech 2001, the annual meeting of the state's biotechnology community, which attracted about 900 people for a day of networking, exhibits and presentations.
- cosponsored the Biotechnology Roundtable, a monthly gathering of biotechnology executives who network and hear presentations.
- provided more than 100 biotechnology companies and entrepreneurs with professional referrals, technical and business advice, relocation assistance, technology transfer expertise and other assistance.

BIOWORK:

this short course teaches students the basics of bioprocessing in preparation for careers in biomanufacturing.

Education and Training

The Education and Training Program promotes work force preparedness and public understanding of biotechnology through teacher training, teaching materials, grants programs, needs assessments and other activities at all

educational levels throughout North Carolina. This year, the Program:

- partnered with the state's Community College System and Novozymes to develop and implement a bioprocess operator's course that prepares workers for entry level jobs in biomanufacturing plants. The first BioWork course was taught in 2001 at Vance-Granville Community College, and more courses were planned to meet strong demand.

BioWork in Action: The first students to enroll in the Center's BioWork course study the basics of bioprocessing at the Franklin County campus of Vance-Granville Community College. The 96-hour course, developed by the Center in partnership with the North Carolina Community College System and Novozymes, prepares workers for entry-level jobs in the biomanufacturing industry.

- awarded five grants totaling $195,963 to strengthen biotechnology education and training programs at two universities, one college and two community colleges. These awards, made through the Education Enhancement Grants Program, are listed on page 15.
- awarded five grants totaling $20,372 to help four schools integrate biotechnology lessons and labs into the biology curriculum. These awards, made through the Biotechnology Education Mini-Grants Program, are listed on page 16.
- sponsored a sabbatical for a community college faculty member to spend the summer working and learning at Biogen's drug-manufacturing plant so she is better able to teach her students about industrial bioprocessing. The award, made through the Faculty Sabbaticals in Industry Grants Program, is listed on page 16.
- sponsored five summer workshops throughout the state to prepare about 70 middle school, high school and community college teachers to teach about the science, applications and issues of biotechnology.

Conference and Education Facility

The Center's 19,000-square-foot Conference and Education Facility is a local, state and national hub for meetings on the science, business and issues of biotechnology. It also serves clients from outside the biotechnology community. This year the Facility provided space, catered meals, and audiovisual support for 18,457 guests at 1,096 meetings.

A complete revision to the Facility's fee policy and schedule resulted in a version that provides preferential pricing to the biotechnology community and allows for more efficient use of individual rooms. The Facility's menu was also revised, resulting in a selection of entrée, break, and reception items that better meet the requests of the Facility's clients. Additionally, the Facility's menu was put out to bid among area caterers, resulting in an expanded list of approved caterers, with more competitive prices. A multi-faceted marketing campaign led to greater awareness of the Facility, its purpose, resources and services, as well as an increase in new external clients.

Library and Information Services

The Center's full-service library provides people in business, academia and government with the latest information on commercial biotechnology. This year the Library responded to 1,144 requests for business information and statistical data about commercial biotechnology. Library staff worked on 137 research projects during the year, arranged 81 interlibrary loans and provided educational videotapes on biotechnology to 78 North Carolina teachers for use in the classroom. About 431 visitors did their own research in the library.

ACCOMPLISHMENTS
Special Initiatives

In addition to managing its ongoing core programs and services for the biotechnology community, the Center continually scans the horizon for new opportunities to sharpen North Carolina's competitiveness in biotechnology. In recent years, the Center has identified opportunities to strengthen the state's genomics, proteomics and bioinformatics infrastructure, encourage the beneficial use of biotechnology in the forestry industry, provide more venture capital for startup companies, improve the biotechnology programs of the state's public, historically minority universities, help Western North Carolina use biotechnology to strengthen its traditional industries, and establish a strong working relationship with the European biotechnology community.

Following are some of the accomplishments of those special initiatives in 2001.

North Carolina Genomics and Bioinformatics Consortium

With the completion of the Human Genome Project in 2001 and the successful mapping of other genomes, scientists began the next step of trying to understand the structure, function and interaction of the many genes and proteins that comprise humans and other organisms. They are relying on bioinformatics to help them store, retrieve and analyze this voluminous biological data.

To strengthen the state's competitiveness in genomics, proteomics and bioinformatics, the Center in 2001 created the North Carolina Genomics and Bioinformatics Consortium, involving about 70 companies, universities and service organizations. The Consortium will unite these assets and enable its members to share information and resources, plan strategic initiatives, and form alliances so they can accomplish together what they could not individually.


TINDALL

The Center hired Dr. Ken Tindall, formerly a senior geneticist at the National Institute of Environmental Health Sciences, to coordinate the Consortium.

Consortium activities that got under way in 2001 include:

- Creation of a database of companies, research facilities, research projects and university faculty involved in genomics, proteomics and bioinformatics in North Carolina.
- Planning for a bioinformatics grid in North Carolina to provide shared computational and data management resources needed for research and education in genomics, proteomics and related sciences.
- Planning for a one-day symposium on bioinformatics grid computing.

BIOINFORMATICS: ***the large-scale storage, retrieval and assessment of data from genomics and protemics studies of living organisms.***

- Identification of ethical issues in genomics and coordination of existing activities in ethics, policy and law by Consortium members including Duke University's Center for Genome Ethics, Law and Policy, the National Humanities Center, North Carolina State University, the North Carolina Biosciences Organization, the North Carolina Association for Biomedical Research, Research Triangle Institute, and Wake Forest University.

The Consortium received strong endorsements from government, academic and industry leaders at an announcement ceremony in December 2000. Speakers at the event included outgoing Governor Jim Hunt; newly elected Governor Mike Easley; Molly Corbett Broad, president of the University of North Carolina System; Jim Goodnight, chairman and CEO of SAS Institute; Robert Ingram, chief operating officer and president of pharmaceutical operations at

North Carolina Genomics and Bioinformatics Consortium

MEMBERS AS OF SEPTEMBER 26, 2001

INDUSTRY

A.M. Pappas & Associates, LLC
Arsenal Digital Solutions
Aventis CropScience
Becton, Dickinson & Company
Biogen
CaroTech, LLC
Cogent Neuroscience Inc.
DNA Sciences Laboratories, Inc.
EMC Corporation
Flad & Associates
The Freelon Group, Inc.
GlaxoSmithKline Inc.
Gentris Corporation
iBiomatics
IBM
Incellico, Inc
Inceutica, Inc.
LabCorp
Lines Technologies Corporation
MWG Biotech, Inc.
NBBJ North Carolina, Inc.
Nonlinear USA Inc.
O'Brien/Atkins Associates, P.A.
Paradigm Genetics
PharmaLinkFHI, Inc.
PPD Inc.
Quintiles, Inc.
RCH Products, Inc.
Ribonomics, Inc.
RMF Engineering, Inc.
Saffron Technology, Inc.
SAS Institute
Sun Microsystems, Inc.
Silicon Graphics, Inc.
Syngenta
Tecan US, Inc.
Telajet Corporation
VennWorks LLC
Xanthon

UNIVERSITY

Duke University
East Carolina University
Elizabeth City State University
NC A&T State University
NC Central University
NC Community College System
NC State University
UNC–Chapel Hill
UNC–Charlotte
UNC–Greensboro
UNC–Wilmington
Wake Forest University
Western Carolina University
Winston-Salem State University

SERVICE

Center for the Public Domain
Genome Consortium for Active Teaching
Kenan Institute for Engineering, Technology & Science
MCNC–NC Supercomputing Center
NC Association for Biomedical Research
North Carolina Biosciences Organization
Parker, Poe, Adams & Bernstein LLP
Research Triangle Foundation of North Carolina
Research Triangle Institute
Small Business & Technology Development Center
Womble Carlyle Sandridge & Rice, PLLC

SUPPORT

Burroughs Wellcome Fund
CIIT Centers for Health Research
National Humanities Center
National Institute of Environmental Health Sciences
National Institute of Statistical Sciences
North Carolina Biotechnology Center
Nuffield Council on Bioethics
U.S. EPA National Health and Environmental Effects Research Laboratory

GlaxoSmithKline; Rod Adkins, general manager of IBM web servers; Dr. Ralph Snyderman, chancellor for health affairs at Duke University Medical Center; and Dr. Charles Hamner, president and CEO of the Biotechnology Center.

Genomics is the study of the structure, function and interaction of all the genes in a living cell, and proteomics is the study of all the proteins in a cell. Bioinformatics is the large-scale storage, retrieval and assessment of data from these biological studies. Advances in these fields promise to give us better food and crops, new medicines, vaccines and diagnostic tests, and a new era of personalized medicine in which therapies are tailored to an individual's unique genetic makeup.

Institute of Forest Biotechnology

The Institute of Forest Biotechnology, a new national organization created by the Center and research, policy, public interest and forestry industry groups, hired its first employee and began to sponsor meetings, forge partnerships and build its administrative foundation in 2001.

Susan McCord was hired as the Institute's project manager in February. She was formerly a program manager with the Forest Biotechnology Group at North Carolina State University. The Institute also filed for nonprofit status, began working with various members of Congress for possible federal funding, expanded its founding board of directors, and initiated a search for an executive director. In June the Institute led the third annual session on forest biotechnology at the Biotechnology Industry Organization's annual conference in San Diego. It also cosponsored the International Union of Forest Research Organizations meeting in Stevenson, Washington.


MCCORD

The Institute began focusing its initial efforts on a few activities that have measurable impact and that reflect the Institute's intention to address the wide range of issues surrounding forest biotechnology. The first projects planned are a series of commissioned papers to be followed by corresponding workshops on three topics: ecological risks associated with forest biotechnology, development of a Heritage Trees Program to restore threatened tree species, and information and technology transfer with regard to ecological, regulatory and policy issues as well as general information on forest biotechnology.

North Carolina Bioscience Investment Fund Deals

COMPANY	LOCATION	INDUSTRY	INVESTMENT
Alternative Control Technologies	Charlotte	Passive insect control technology	$222,222
AmpliStar	Winston-Salem	Cancer screening tests	$2,600,00
Artecel Sciences	Durham	Cell therapy using fat cells	$2,000,000
Bloodhound Software	Durham	Health claims processing	$2,425,960
Blue292	Durham	E-commerce/ environmental testing services and products	$4,000,005
Cell Analytics	Raleigh	Cell biology research instrumentation	$1,818,099
Cogent Neuroscience	Durham	Neurogenomics	$500,000
Encelle	Greenville	Wound healing	$1,000,000
MX Staffing	Durham	Internet-based staffing and certification for health care professionals	$2,000,100
PDx	Winston-Salem	Automation of radiology reporting	$60,000
		Total investment	**$16,629,119**

The Institute's mission is to work for societal, ecological and economic benefits from appropriate uses of biotechnology in forestry worldwide.

Forestry executives believe biotechnology will be an important tool in helping their industry meet the rising demand for wood. It can be used to grow more wood on less land, produce hardier trees with better traits, reduce the use of chemicals in pulp and paper processing, and help preserve endangered species of trees.

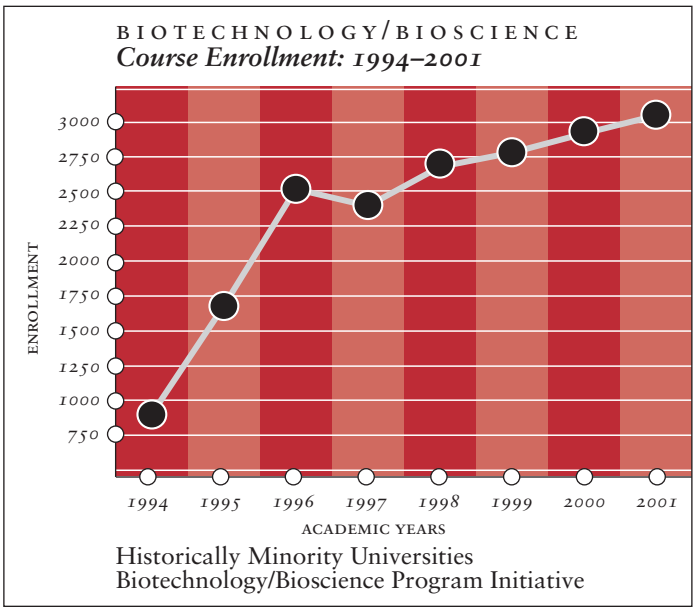
The forestry industry employs 140,000 people in North Carolina and produces more than 6 percent of the state's manufacturing revenue.

North Carolina Bioscience Investment Fund

To help ease North Carolina's traditional shortage of venture capital for biotechnology companies, the Center created the North Carolina Bioscience Investment Fund in 1998 with $26 million in commitments from the state's General Assembly and a variety of North Carolina banks, corporations and foundations. The Fund, professionally managed by Eno River Capital of Durham, makes early stage investments in North Carolina bioscience companies. By the end of 2001, the Fund had invested $16.6 million in 10 promising companies, listed above.

Historically Minority Universities Biotechnology Program Initiative

The state's six public, historically minority universities have traditionally lacked the resources to contribute significantly to biotechnology education and training. In 1994 the Center began an initiative to remedy the situation. With special appropriations from the state's General Assembly, the Center began awarding grants to strengthen the biotechnology teaching and training programs of the six universities: Elizabeth City State University, Fayetteville State University, North Carolina A&T State University, North Carolina Central University, Winston-Salem State University, and the University of North Carolina at Pembroke. The grants, totaling $9.6 million over eight years, enabled the



universities to plan programs, design curricula and courses, train faculty, acquire lab equipment, develop instructional materials, and recruit students.

Since the initiative was begun, enrollment in bioscience courses at these universities has more than tripled. Today, more than 3,000 students take courses in the life sciences, and they are better prepared to fill jobs in the bioscience industry, pursue graduate degrees in the life sciences or enroll in medical school.

In 2001, the final year of the initiative, the Center awarded grants totaling $946,500 to help the universities further strengthen their biotechnology programs. The grants are listed on page 16.

Biotechnology in Western North Carolina

The Center in 2001 enlisted a dozen leaders in Western North Carolina to determine how biotechnology can enhance the economic, academic, environmental and cultural life of the region.

The Steering Committee to Strengthen Biotechnology in Western North Carolina met three times in May and June to assess biotechnology opportunities in the region's agricultural, health care, manufacturing and environmental industries. A report on its findings was to be distributed later in the year.

At the first meeting, the Committee heard presentations on how biotechnology can be used for horticulture, herbals, native plants, forestry, Christmas trees, value-added crops and the re-establishment of chestnut trees. Presentations were also given on the need for biotechnology training and support programs at Western Carolina University, the University of North Carolina at Asheville, and Asheville-Buncombe Technical Community College. The second meeting in Asheville examined needs and opportunities in health care and manufacturing. The third meeting at UNC-Asheville addressed the environmental and cultural possibilities of biotechnology and examined possible external resources available to the region.

European Relations

As North Carolina's biotechnology industry matures and brings products to market, it will increasingly need European partners to help them gain entrée to the largest market outside the United States. North Carolina is also a popular site for European companies with U.S. operations, such as Aventis, BASF, Bayer, Diosynth, GlaxoSmithKline, Novozymes, Syngenta and many others. Thus, the Center places a high emphasis on maintaining positive relationships with European governments, institutions and biotechnology companies.

Ernst Schwanhold, secretary of economic affairs for the German state of North Rhine-Westphalia, visited the Center in May 2001 with a delegation of 13 German executives and reporters as part of his state's five-year technology exchange agreement with North Carolina. Left: John Irick, president, NCBIO. Right: Steven Burke, senior vice president, North Carolina Biotechnology Center.

Senior executives from the Center gave presentations and called on companies in Ireland, Scotland, Germany and other European countries in 2001. The Center also entered the third year of its five-year agreement with the German state of North Rhine-Westphalia for technology exchange. A German delegation of government and industry representatives visited the Center and North Carolina biotechnology companies to promote business between the two states. North Carolina also sent a delegation to Germany for interaction with German government officials and biotechnology companies.

WESTERN NORTH CAROLINA:

a steering committee was formed to determine how biotechnology can enhance the economic, academic, environmental and cultural life of the region.

Grants and loans awarded in 2001

The North Carolina Biotechnology Center awarded 103 grants and loans totaling $5.6 million to universities, companies and other organizations in the 2000–2001 fiscal year.

Small Business Research Award Program

AgraSol Inc., Raleigh

Thomas Currier • $148,800 • *"Ophiostoma Application Development."*

Biolex Inc., Pittsboro

Dr. Anne-Marie Stomp • $100,000 • *"Demonstration of Alpha-interferon Expression in Lemna."*

Artecel Sciences, Durham

William Wilkison • $150,000 • *"Chondrogenic Potential of Adipose-Derived Stromal Cells."*

Hybrizyme Corp., Raleigh

Randy L. Allen • $100,000 • *"An Assay Platform for Detecting Endocrine Disrupters."*

PhytoMyco Research Corp., Greenville

Dr. Ven Subbiah • $100,000 • *"Discovery of Endothelin Antagonists from Natural Products."*

Quill Medical Inc., Research Triangle Park

Dr. Simon C. Roe, College of Veterinary Medicine, North Carolina State University • $150,000 • *"In Vivo Efficacy Studies of the Quill Self-anchoring Suture."*

Business Development Award Program

Neos Discovery Inc., Raleigh

Richard Guenther • $10,000 • *"Startup Phase Business Development."*

Snap Genetics Inc., Raleigh

Dr. Dipak Mahato • $10,000 • *"A Novel Technology for Mammalian Gene Targeting."*

Synthematix Inc., Morrisville

Robin Smith • $10,000 • *"Synthematix Business Development/Business Plan Development."*

TrialPages Inc., Raleigh

Gregory W. Prospero • $8,970 • *"Trialpages.com Web Site Development."*

SBIR Bridge Fund Program

Sylvanus Inc., Pittsboro

Dr. Stephen B. Friedman • $75,000 • *"Development of a Novel Test Array for the Detection of Polychlorinated Biphenyls (PCBs)."*

Proof of Principle Awards Program

North Carolina State University

Dr. Paul F. Agris, Department of Molecular and Structural Biochemistry • $25,000 • *"Production and Optimization of Novel Therapeutic Screening Tools."*

Collaborative Funding Assistance Program

Duke University Medical Center
IN PARTNERSHIP WITH ARTECEL SCIENCES INC., DURHAM

Dr. Farshid Guilak, Department of Surgery • $60,000 over two years • *"Chondrogenic Potential of Stromal Cells Derived from Subcutaneous Fat."*

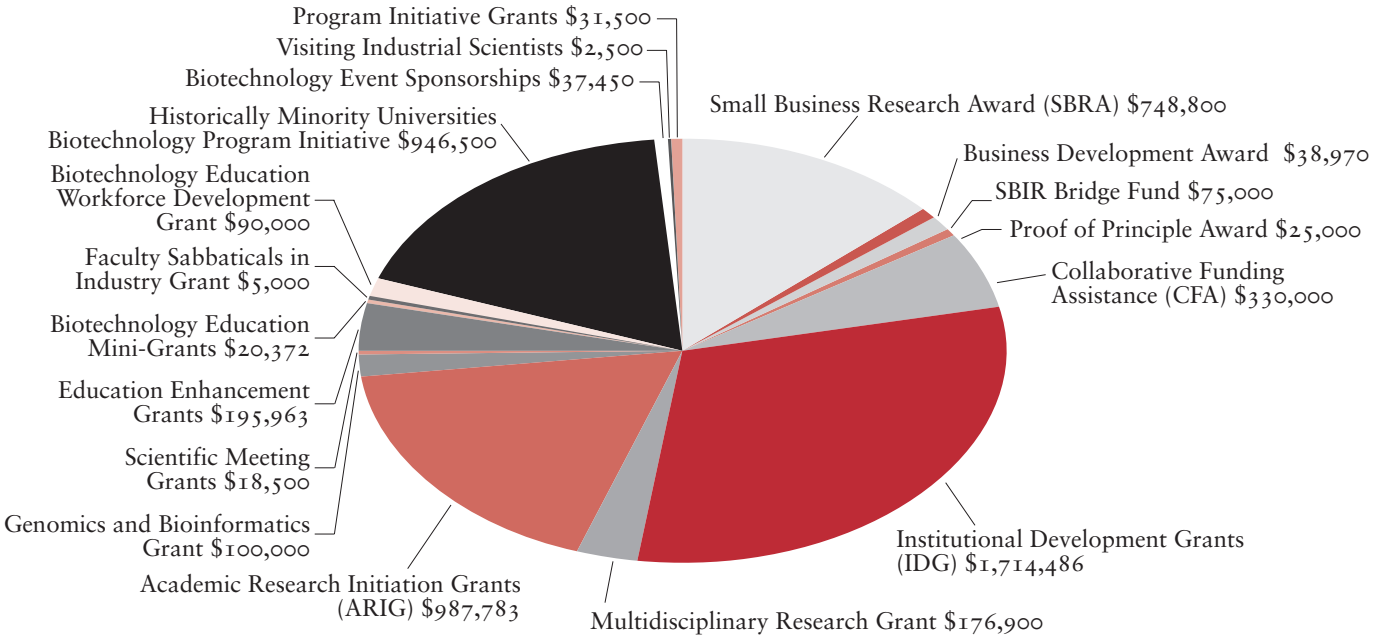
Duke University
In partnership with SunDance Genetics Inc., Durham

Dr. James F. Reynolds, Department of Biology • $60,000 over two years • *"Investigation of enhanced drought tolerance in corn."*

North Carolina State University
IN PARTNERSHIP WITH AGRASOL INC., RALEIGH

Dr. D. Michael Benson, Department of Plant Pathology • $60,000 over two years • *"Bacterial Formulation Technology for Biological Control of Plant Diseases."*

2001 Grants and Loans by Program



North Carolina State University
IN PARTNERSHIP WITH SCYNEXIS CHEMISTRY & AUTOMATION INC., DURHAM

Dr. Daniel L. Comins, Department of Chemistry • $60,000 over two years • *"Preparation of Novel Lead Generation Libraries."*

North Carolina State University
IN PARTNERSHIP WITH BIORESOURCE INTERNATIONAL INC., RALEIGH

Dr. Jason C.H. Shih, Department of Poultry Science • $30,000 over one year • *"Nutritional Application of Keratinase Technology."*

University of North Carolina at Chapel Hill
IN PARTNERSHIP WITH NOBEX CORP., RESEARCH TRIANGLE PARK

Dr. Robert M. Pope, Department of Psychiatry • $60,000 over two years • *"Development of an LC/MS Assay to Quantify Orally Active Human Insulin Conjugates in Plasma."*

Institutional Development Grants Program

Duke University

Dr. Norman L. Christensen, Dean of the School of the Environment • $150,000 • *"A Recruitment Package for Dr. David E. Hinton to Duke University."*

Dr. William M. Reichert, Department of Biomedical Engineering • $30,000 • *"Purchase of Arrayer, Imaging Ellipsometer and Software Upgrade for FTIR Spectrometer."*

Duke University Medical Center

Dr. Mark W. Dewhirst • Department of Radiation Oncology • $93,750 • *"Optical Molecular Imaging Facility."*

Dr. Farshid Guilak, Department of Surgery • $105,000 • *"Materials Testing System for Biotechnology Applications."*

North Carolina State University

Dr. John Cavanagh, Department of Molecular and Structural Biochemistry • $112,500 • *"Acquisition of a 600 MHz NMR Spectrometer."*

Dr. Linda Hanley-Bowdoin, Department of Biochemistry • $50,000 • *"Purchase of an Oligonucleotide-based Microarray System."*

University of North Carolina at Chapel Hill

Dr. Laurie Betts, Department of Pharmacology • $111,500 • *"Core Facility for Biomolecular X-Ray Crystallography."*

Dr. Rudolph L. Juliano, Department of Pharmacology • $146,129 • *"Multi-User Confocal Imaging System."*

Dr. Gary J. Pielak, Department of Chemistry • $88,895 • *"Expansion of the UNC Macromolecular Interactions Facility."*

Dr. Brian J. Popko, Department of Biochemistry and Biophysics • $80,000 • *"Global Analysis of Gene Expression."*

Dr. R. Balfour Sartor, Department of Medicine • $73,475 • *"Gnotobiotic Core Facility."*

University of North Carolina at Charlotte

Dr. Mark G. Clemens, Department of Biology • $167,250 • *"DNA Microarray Facility: The Charlotte Genomics Consortium."*

University of North Carolina at Wilmington

Dr. Ami Wilbur, Department of Biological Sciences • $97,000 • *"An ABI 3100 Genetic Analyzer for the DNA Analysis Core Facility at the Center for Marine Science."*

Wake Forest University School of Medicine

Dr. Richard A. Manderville, Department of Chemistry • $110,000 • *"Acquisition of a LC/MS Spectrometer."*

Dr. Frank M. Torti, Department of Internal Medicine • $149,987 • *"Faculty Recruitment of Dr. Andrew Thorburn for Research in Molecular Mechanisms Controlling Cell Survival in Apoptosis."*

Dr. Alan J. Townsend, Department of Biochemistry • $64,000 • *"Multi-User Confocal Imaging System."*

Dr. Kent E. Vrana, Department of Physiology and Pharmacology • $85,000 • *"Piedmont Triad Community Research Center DNA Array Instrumentation."*

Multidisciplinary Research Grants Program

Duke University

Dr. Michael C. Pirrung, Department of Chemistry • $176,900 • *"Fabrication and Interrogation of Ultradense Oligonucleotide Arrays."*

Academic Research Initiation Grants Program

Duke University

Dr. Stephen L. Craig, Department of Chemistry • $55,000 • *"DNA-based Modules for Reversibly Assembled Materials."*

Dr. Dontcho V. Jelev, Department of Mechanical Engineering • $55,000 • *"Environmentally Sensitive Systems for Molecular Transport Facilitated by Transduction Peptides."*

Dr. Seth W. Kullman, Nicholas School of the Environment • $55,000 • *"Toxicant-induced Differential Gene Expression and Production of an Aquatic Gene Array."*

Duke University Medical Center

Dr. Guoping Feng, Department of Neurobiology • $55,000 • *"A Genome-wide Approach to Identify Signals Determining Neurotransmitter Phenotypes."*

Dr. Laura E. Niklason, Department of Biomedical Engineering and Anesthesia • $55,000 • *"Electrical Stimulation of Skeletal Myoblasts."*

North Carolina State University

Dr. Paul Agris, Department of Biochemistry • $54,649 • *"RNA Target Assay Development for Infectious Diseases."*

Dr. Prema Arasu, Department of Microbiology, Pathology and Parasitology • $55,000 • *"Controlling Parasitism via Self-inhibitory Molecules Expressed by Infective Larvae."*

Dr. John F. Kadla, Department of Wood and Paper Science • $55,000 • *"Metabolic Profiling: A New Tool for Functional Genomics in Loblolly Pine."*

Dr. Robert M. Petters, Department of Animal Science • $55,000 • *"Germline Modification of Mammals Using Synthetic RNA/DNA Oligonucleotides."*

Dr. Alex I. Smirnov, Department of Chemistry • $55,000 • *"Microwave T-jump Method for High-field EPR Kinetic Protein-folding Experiments."*

Dr. Binghe Wang, Department of Chemistry • $55,000 • *"Gated Carbon Nanotubes."*

University of North Carolina at Charlotte

Dr. Kenneth L. Bost, Department of Biology • $55,000 • *"The Stable Transformation of Bread Wheat with a Viral Gene for Use in the Production of an Edible Mucosal Vaccine."*

Wake Forest University

Dr. Rebecca W. Alexander, Department of Chemistry • $55,000 • *"Mirror-image Inhibitors of an Essential Bacterial Protein."*

Dr. Paul B. Jones, Department of Chemistry • $55,000 • *"New Strategies for Photodynamic Therapy."*

Dr. Ulrich Bierbach, Department of Chemistry • $55,000 • *"Photochemistry and Photobiology of Novel DNA-Targeted Light-Activatable Rhodium (III) Ammine Compounds."*

Wake Forest University School of Medicine

Dr. Scott D. Cramer, Department of Cancer Biology • $54,925 • *"Prostate-targeted Immunotoxin Gene Therapy."*

Dr. Ashok N. Hegde, Department of Neurobiology and Anatomy • $55,000 • *"Parkin, the Ubiquitin-Proteasome Pathway and Parkinson's Disease."*

Dr. Constantinos Koumenis, Department of Radiation Oncology • $53,209 • *"Use of a Gamma Knife Unit for Spatial and Temporal Control of Gene Expression from a Radioinducible, Bicistronic Adenoviral Vector in Gene Therapy of Malignant Gliomas."*

Genomics and Bioinformatics Grants Program

University of North Carolina at Chapel Hill

Dr. David Fenstermacher, Center for Bioinformatics • $100,000 • *"North Carolina Shared Bioinformatics Resource."*

Scientific Meeting Grants Program

Cogent Neuroscience Inc., Durham

Christina C. Russell • $10,000 • *"First Annual Symposium on Neurogenomics."*

East Carolina University

Dr. Cindy Putnam-Evans, Department of Biology • $500 • *"Annual Meeting of the Southern Section of the American Society of Plant Physiologists."*

University of North Carolina at Chapel Hill

Dr. Fulton T. Crews, Bowles Center for Alcohol Studies • $3,000 • *"Genes and Gene Delivery for Diseases of Alcoholism International Symposium 2001."*

Dr. Linda L. Spremulli, Department of Chemistry • $5,000 • *"Symposium on RNA Biology IV: RNA, Tool and Target."*

Education Enhancement Grants Program

Craven Community College, New Bern

Dr. Charlotte Patterson-Morgan, Department of Science, Health, and Physical Education • $13,500 • *"Biotech in an Introductory Microbiology Course."*

Peace College, Raleigh

Dr. Joe Wolf, Department of Biology • $12,658 • *"Introducing Bioinformatics into Biotechnology-related Courses at Peace College."*

Sandhills Community College, Pinehurst

Mary W. Daniel, Department of Science • $6,860 • *"Biology Course Enhancement."*

University of North Carolina at Asheville

Dr. Debra Van Engelen and Dr. Bert E. Holmes, Department of Chemistry • $93,000 • *"Establishing a Biochemistry Program."*

University of North Carolina at Charlotte

Dr. Kenneth L. Bost, Department of Biology • $69,945 • *"Biotechnology Laboratory Courses for Undergraduates and Post-Baccalaureates."*

Biotechnology Education Mini-Grants Program

Ravenscroft School, Raleigh

Leslie B. Pressel, Department of Biology • $5,000 • *"Students Teaching Students: A Project in Biotechnology."*

Leesville Road High School, Raleigh

Zoe M. Welsh, Department of Biology • $4,997 • *"Integrating Biotechnology into the Biology Classroom."*

North Carolina School of the Arts, Winston-Salem

Sherri Andrews, General Studies • $4,479 • *"Advanced Laboratories for Advanced Biology."*

Highland School of Technology, Gastonia

Margaret E. Venable, Department of Science • $2,977 • *"DNA Restriction Analysis."*

Orange High School, Hillsborough

Rebecca C. Smith, Department of Science • $2,919 • *"Implementing Gel Electrophoresis Laboratory Activities into Introductory Biology."*

Faculty Sabbaticals in Industry Grants Program

Pitt Community College, Greenville

Tammy Atchison • $5,000 • *"Sabbatical at Biogen."*

Biotechnology Education Workforce Development Grant Program

Vance-Granville Community College, Henderson

Garland Elliott • $90,000 • *"Bioprocess Technician Course."*

Historically Minority Universities Biotechnology Program Initiative

Elizabeth City State University

Dr. Ronald H. Blackmon and Dr. Gary L. Harmon, Department of Biology • $170,000 • *"Elizabeth City State University Biotechnology Program Initiative: Phase VIII."*

Fayetteville State University

Dr. Valerie Fleming, Department of Natural Sciences • $170,000 • *"Biotechnology Program Enhancement: Phase III."*

North Carolina A&T State University

Dr. Marihelen Glass, Department of Natural Resources and Environmental Design • $167,500 • *"Increasing Environmental Biotechnology Capabilities at North Carolina A&T State University."*

North Carolina Central University

Dr. Goldie S. Byrd and Dr. James M. Schooler, Departments of Biology and Chemistry • $170,000 • *"Enhancing Minority Representation in Biotechnology: An NCCU Interdisciplinary Approach."*

University of North Carolina at Pembroke

Dr. Leonard Holmes, Department of Chemistry & Physics • $170,000 • *"A Comprehensive Biotechnology Program at UNC-Pembroke."*

Winston-Salem State University

Dr. Kim H. Tan and Dr. Ann Weigl, Project Strengthen • $170,000 • *"Advancing Interdisciplinary Biotechnology Program."*

Biotechnology Event Sponsorships Program

Council for Entrepreneurial Development

Monica Doss • $1,500 • *"Venture 2001."*

Duke University

Dr. Kim Johnson, Duke Bioinformatics Shared Resource • $2,000 • *"Critical Assessment of Techniques for Microarray Data Analysis (CAMDA)."*

Dr. Kenneth Kreuzer, Cell and Molecular Biology Training Program • $2,000 • *"Molecular Madness: Exploring Human Disease and Birth Defects."*

Dr. Patricia Van Doren, Department of Cell Biology • $500 • *"Southeastern Developmental Biology Symposium."*

Dr. Paul P. Wang, Department of Electrical and Computer Engineering • $2,500 • *"Atlantic Symposium on Computational Biology and Genome Information Systems and Technology."*

Duke University Medical Center

Dr. Larry Burk, Center for Integrative Medicine • $1,500 • *"Complementary and Alternative Medicine in Cancer: Real Change for the Real World."*

Dr. Daniel P. Kiehart, Program in Genetics • $2,000 • *"Epigenetics."*

National Institute of Environmental Health Sciences

Dr. James Caffrey • $200 • *"Bioinformatics: Research Uses and Needs in Academia and Industry."*

Dr. Trinia Simmons • $2,000 • *"Fourth Annual NIEHS/NTA Biomedical Science and Career Fair."*

North Carolina Academy of Science

Dr. Susan Stephenson • $1,250 • *"Annual Meeting."*

North Carolina Biosciences Organization

Sam Taylor • $1,000 • *"Ethical, Legal and Societal Issues in Biotechnology: A Primer for Industry Leaders."*

North Carolina State University

Dr. Robert Anholt, Department of Zoology • $1,000 • *"W.M. Keck Center for Behavioral Biology 2000-2001 Seminar Series."*

Dr. Gregg A. Dean, College of Veterinary Medicine • $2,500 • *"Second Annual Animal Genomics Symposium: Functional Genomics."*

Dr. William L. Miller, Department of Biochemistry • $1,500 • *"Annual Conference of the Triangle Consortium for Reproductive Biology: Growth and Apoptosis in Reproductive Tissues."*

Dr. Neil Olson, College of Veterinary Medicine • $2,500 • *"Animal Genomics 2000 Symposium."*

Dr. Wendell McKenzie, Department of Genetics • $2,000 • *"Genetic Science and the New Millennium."*

Southeast Life Sciences Association

Charles Calkins • $3,000 • *"Southeastern BIO Investor Forum 2000."*

University of North Carolina at Asheville

Dr. John G. Stevens, Department of Chemistry • $1,000 • *"Biochemistry and the Undergraduate."*

University of North Carolina at Chapel Hill

Dr. H. Shelton Earp and Dr. Albert S. Baldwin, Lineberger Comprehensive Cancer Center • $2,500 • *"Twenty-fifth Annual UNC Lineberger Comprehensive Cancer Center Symposium: Regulatory Mechanisms in Human Cancer."*

Dr. Jan Hermans, Department of Biochemistry and Biophysics • $2,000 • *"Workshop in Structural Biology and Bioinformatics."*

University of North Carolina at Wilmington

Dr. Ned H. Martin, Department of Chemistry • $1,500 • *"Fifth UNCW Symposium on Chemistry and Biochemistry."*

Wake Forest University School of Medicine

Dr. William H. Gmeiner, Department of Biochemistry • $1,500 • *"Symposium in Honor of Professor J. William Lown."*

Visiting Industrial Scientists Program

North Carolina A&T State University

Dr. Bette McKnight, Department of Biology • $2,500 • *"Visit by Dr. Ricardo Parker."*

Program Initiative Grants

Asheville-Buncombe Technical Community College, Asheville

Dr. Thomas F. Dechant • $4,000 • *"Preparing for a Role in Biotechnology Development for Western North Carolina."*

BioAbility, Research Triangle Park

William Bullock • $2,500 • *"North Carolina Life Sciences Salary and Compensation Survey."*

Greater Winston-Salem Chamber of Commerce

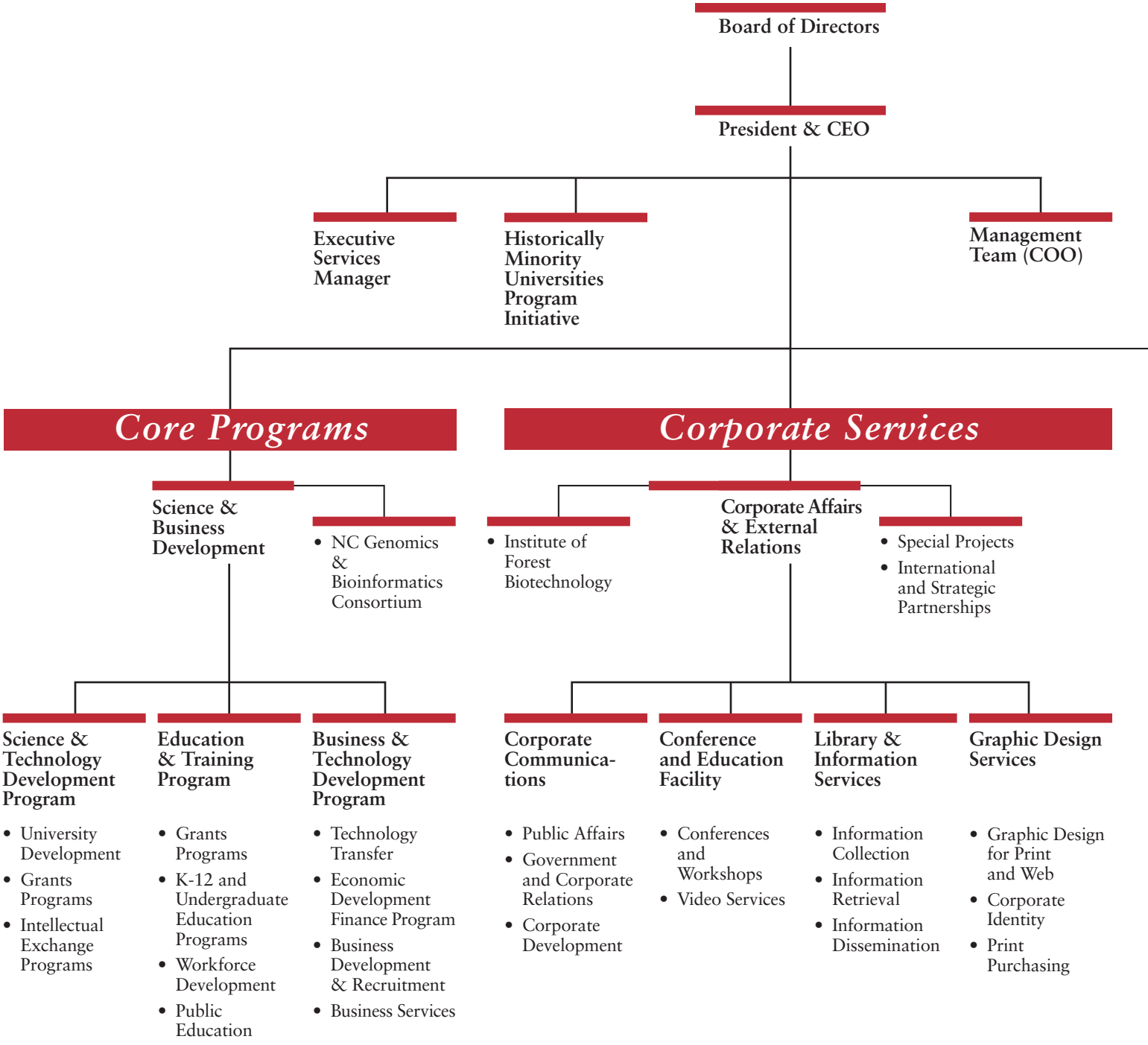
Claudette Weston • $5,000 • *"Connectivity 2001."*

North Carolina Community Colleges Foundation Inc., Raleigh

Scott Ralls • $20,000 • *"Implementation of the BioWork Process Technician Training Course."*

THE NORTH CAROLINA BIOTECHNOLOGY CENTER

Program Structure & Task Areas



Corporate Administration

Corporate Administration & CFO

- Coordination & Oversight
- Fiduciary Management
- Subsidiary Operations

Financial Operations

- Finance and Accounting Management
- Purchasing and Material Management
- Budget Development & Monitoring
- Audits & Compliance

Contracts & Facility Services

- Grants and Contracts Administration
- Facilities Maintenance & Security
- Audits & Compliance
- Grant Information Management

Administrative Support Services

- Word Processing
- Project and Logistical Support
- Database Management
- Telephone System

Information Systems

- Network Administration and Maintenance
- Training
- Internet
- Database Services
- Application Management

Human Resources & Compensation

- Personnel Management
- Compensation & Benefits Management
- Legal & Regulatory Compliance

Board of Directors

Staff to Board of Directors

FINANCIAL STATEMENTS

Independent Auditors' Report

The Board of Directors
North Carolina Biotechnology Center
and Subsidiary:

We have audited the accompanying consolidated statements of financial position of the North Carolina Biotechnology Center and Subsidiary as of June 30, 2001 and 2000, and the related consolidated statements of activities and changes in net assets and cash flows for the years then ended. These consolidated financial statements are the responsibility of the Center's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits.

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

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the North Carolina Biotechnology Center and Subsidiary at June 30, 2001 and 2000, and the changes in their net assets and their cash flows for the years then ended in conformity with accounting principles generally accepted in the United States of America.

KPMG LLP

July 27, 2001

Consolidated Statements of Financial Position

Years ended June 30, 2001 and 2000

Assets	2001	2000
Cash	$ 720,886	1,464,085
Investments *(note 3)*	32,149,575	28,791,022
Receivables:		
Accrued interest receivable	176,938	254,282
Miscellaneous receivables	110,306	27,665
Receivable from North Carolina Bioscience Investment Fund	27,850	27,850
Grants/contracts receivable	—	25,666
Loan receivable *(note 4)*	75,000	75,000
Notes receivable *(notes 2 and 4)*	1,930,063	1,975,901
Allowance for uncollectible notes receivable *(notes 2 and 4)*	(1,930,063)	(1,975,901)
Total receivables	390,094	410,463
Other assets *(note 8)*	45,795	6,000
Property, plant, and equipment, net *(note 5)*	5,166,983	5,441,216
Total assets	**$ 38,473,333**	**36,112,786**
Liabilities and Net Assets		
Accounts payable and accrued expenses	142,980	87,593
Grants/contracts and notes payable *(note 6)*	8,017,131	6,954,162
Deferred revenues	1,447,629	653,637
Total liabilities	9,607,740	7,695,392
Net assets:		
Unrestricted net assets:		
Designated for specific purposes *(note 1(d))*	27,859,626	22,914,249
Undesignated	892,221	5,404,129
Temporarily restricted *(note 1(d))*	113,746	99,016
Total net assets	28,865,593	28,417,394
Total liabilities and net assets	**$ 38,473,333**	**36,112,786**

See accompanying notes to consolidated financial statements.

Consolidated Statements of Activities and Changes in Net Assets

Years ended June 30, 2001 and 2000

	2001	2000
Unrestricted revenues, gains and other support:		
Grants and contracts:		
State of North Carolina	$ 7,645,976	9,328,287
Note repayments	1,034,192	355,235
Interest *(note 7)*	1,788,389	1,580,906
Conference and educational facility	410,359	481,430
Other	814,559	481,504
Realized and unrealized (loss) gain on investments	(279,875)	189,380
Net assets released from restrictions	81,520	32,340
Total unrestricted revenues, gains and other support	11,495,120	12,449,082
Expenses and losses:		
Science and technology development:		
Institutional development grants	1,714,486	1,116,676
Academic research initiation grants	960,560	1,058,369
Collaborative funding program	195,203	432,340
Multidisciplinary research grants	(73,001)	499,349
Public HMU program initiative	1,150,549	701,496
Economic development loan programs	834,487	258,472
Conference and educational facility	462,632	482,452
Workforce training project	254,343	132,456
Library and information services	232,896	241,465
Education and training program grants	220,955	196,649
Genomics and bioinformatics program	219,405	—
Intellectual exchange activities	61,796	40,154
Biotechnology event grants/sponsorships	59,250	32,650
Forest biotechnology initiative	45,116	27,911
Other programs	24,936	39,608
Program management	2,812,086	2,280,288
General and administrative	1,885,952	1,712,446
Total expenses and losses	11,061,651	9,252,781
Change in unrestricted net assets	433,469	3,196,301
Temporarily restricted revenues:		
Contributions	96,250	67,850
Net assets released from restrictions	(81,520)	(32,340)
Change in temporarily restricted net assets	14,730	35,510
Change in total net assets	448,199	3,231,811
Net assets, beginning of year	28,417,394	25,185,583
Net assets, end of year	**$ 28,865,593**	**28,417,394**

See accompanying notes to consolidated financial statements.

Consolidated Statements of Cash Flows

Years ended June 30, 2001 and 2000

	2001	2000
Cash flows from operating activities:		
Change in total net assets	$ 448,199	3,231,811
Adjustments to reconcile change in total net assets to net cash provided by operating activities:		
Depreciation	325,188	348,026
Loss on sale of property and equipment	9,557	574
Realized and unrealized loss (gain) on investments	279,875	(189,380)
Equity in loss from North Carolina Bioscience Investment Fund	231,484	223,816
Increase (decrease) in cash due to changes in:		
Grants/contracts receivable	25,666	(23,960)
Notes receivable	45,838	50,902
Allowance for uncollectible notes receivable	(45,838)	(50,902)
Accrued interest receivable	77,344	(89,563)
Miscellaneous receivables	(83,219)	49,214
Other assets	(39,217)	—
Accounts payable and accrued expenses	55,387	(44,422)
Grants/contracts and notes payable	1,062,969	(55,688)
Deferred revenues	793,992	370,887
Net cash provided by operating activities	3,187,225	3,821,315
Cash flows from investing activities:		
Proceeds from sale of property and equipment	—	630
Purchase of property and equipment	(60,512)	(102,625)
Proceeds from sale of investments	81,439,233	55,082,504
Purchase of investments	(85,309,145)	(58,177,617)
Payment of note payable	—	(3,000,000)
Issuance of loan receivable	—	2,965,000
Net cash used by investing activities	(3,930,424)	(3,232,108)
Net (decrease) increase in cash	(743,199)	589,207
Cash, beginning of year	1,464,085	874,878
Cash, end of year	$ 720,886	1,464,085
Supplemental disclosure of cash flow information:		
Cash paid during the year for interest	$ —	167,217

Supplemental schedule of non-cash investing and financing activities:

During the year ended June 30, 2001, the Center received $168,266 in stock as repayment on notes issued under the economic development finance program.

See accompanying notes to consolidated financial statements.

Notes to Consolidated Financial Statements

June 30, 2001 and 2000

(l) Organization and Summary of Significant Accounting Policies

(a) Organization and Purpose

The North Carolina Biotechnology Center (the "Center") was incorporated in 1984 for the purpose of furthering economic development in North Carolina through education, research and commercial development in biotechnology. The Center aids the biotechnology-related efforts of researchers, businesses, state and federal governments, and other agencies primarily through awards of research grants restricted to specific programs.

The North Carolina Bioscience Ventures, LLC ("Ventures") is a wholly-owned subsidiary of the Center which is used to account for a special $10 million appropriation to the Center from the State of North Carolina. The purpose of the appropriation and establishment of Ventures is to promote the development of the bioscience industry in North Carolina. The appropriation remains in Ventures until funds are drawn down by the North Carolina Bioscience Investment Fund, LLC ("BIF"). The BIF is responsible for investing funds of the Center along with funds from other investors into portfolio companies.

(b) Basis of Accounting and Presentation

The consolidated financial statements have been prepared using the accrual basis of accounting.

Net assets and revenues, expenses, gains and losses are classified based on the existence or absence of donor-imposed restrictions. Accordingly, net assets of the Center and changes therein are classified and reported as follows:

Unrestricted net assets — Net assets that are not subject to donor-imposed stipulations.

Temporarily restricted net assets — Net assets subject to donor-imposed stipulations that may or will be met either by actions of the Center and/or the passage of time.

Revenues are reported as increases in unrestricted net assets unless use of the related asset is limited by donor-imposed restrictions. Expenses are reported as decreases in unrestricted net assets. Gains and losses are reported as increases or decreases in unrestricted net assets unless their use is restricted by explicit donor stipulation or by law. Expirations of temporary restrictions on net assets (i.e., the donor-stipulated purpose has been fulfilled and/or the stipulated time period has elapsed) are reported as reclassifications between the applicable classes of net assets.

(c) Principles of Consolidation

The consolidated financial statements include the financial statements of North Carolina Biotechnology Center and its wholly-owned subsidiary. All significant intercompany balances and transactions have been eliminated in consolidation.

(d) Significant Accounting Policies

The following significant accounting policies have been used in the preparation of the financial statements:

Cash and Investments

The Center invests funds not immediately needed for day-to-day operations in short-term investments, primarily certificates of deposit and commercial paper, consistent with guidelines established by the Board of Directors. These guidelines require that the Center invest only in certain financial instruments considered to be both conservative and adequately diversified. A cash management advisory committee and an equity investment advisory panel periodically review the Center's investment portfolio.

The BIF represents Ventures investment in the North Carolina Bioscience Investment Fund, LLC, which is accounted for on the equity method. Equity investments include private equity investments in biotechnology/bioscience companies and venture capital funds.

Investments are generally recorded at market value. In the case of certain less marketable investments, principally private equity investments, investments are carried at cost unless an external event substantiates a change in value. In some instances, those changes in value may require use of estimates. Because of the inherent uncertainty in the use of estimates, values that are based on estimates may differ from the values that would have been used had a ready market for the investments existed.

Grants/Contracts Receivable, Loan Receivable and Notes Receivable

An allowance for uncollectible receivables has been provided for notes receivable. All of the Center's other grants, contracts and loans receivable are considered to be fully collectible.

Property, Plant, and Equipment

Property, plant, and equipment are recorded at cost. Depreciation is provided using the straight-line method over the estimated useful lives of five years for furniture, fixtures and equipment and thirty years for the Center's permanent headquarters.

Recognition of Grant Awards and Grants Payable

Grant awards and the corresponding grants payable are recognized at the time the grant award is approved by the Executive Committee of the Board of Directors.

Net Assets
Certain unrestricted net assets have been designated for specific purposes by the Board of Directors. At June 30, 2001 and 2000, unrestricted net assets designated for specific purposes consisted of the following:

	2001	2000
Fixed assets	$ 5,166,983	5,441,216
Building renovations and repairs	3,284,471	1,000,000
Future economic development investment	4,356,705	—
Stocks and equity investments	12,643,391	11,902,831
Other	2,408,076	4,570,202
	$ 27,859,626	22,914,249

Temporarily restricted net assets are available for various Center programs including plant molecular biology, genomics and the RTP Biochemistry Club.

Contributions
Contributions, including unconditional promises to give, are recognized as revenues in the period received. Conditional promises to give are not recognized until they become unconditional, that is, when the conditions on which they depend are substantially met. Contributions of assets other than cash are recorded at their estimated fair value.

Temporarily Restricted Net Assets Released from Restrictions
By holding events and meetings, purchasing training supplies, and performing data gathering /dissemination, the Center released $81,520 and $32,340 of temporarily restricted net assets from donor imposed restrictions in 2001 and 2000, respectively.

Recognition of Funding
Funds are granted periodically from private and public agencies for specific purposes or to aid the Center's general operation and sustain its continued existence. Funds appropriated for specific purposes, including grants for Public Historically Minority Universities and Agricultural Research Funds, are deemed to be earned and reported as revenue when the Center has incurred expenditures in compliance with the grant agreement. Such amounts received, but not yet earned, are reported as deferred revenues.

The Center received 67% and 75% of its unrestricted revenues from the State of North Carolina in 2001 and 2000, respectively.

Functional Allocation of Expenses
The costs of providing the various programs and activities of the Center have been summarized on a functional basis in the statements of activities and changes in net assets. Certain general and administrative expenses totaling $856,881 and $657,253 for the years ended June 30, 2001 and 2000, respectively, have been allocated among the programs and activities benefited.

Income Taxes
The Center is exempt from payment of income taxes under the provisions of Section 501(c)(3) of the Internal Revenue Code, except for any unrelated business income. Since there was no unrelated business net income during 2001 and 2000, no provision for income taxes has been made. The Center has requested a ruling from the Internal Revenue Service that Ventures' operations are consistent with its Section 501(c)(3) tax status.

Use of Estimates
The preparation of the consolidated financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Reclassifications
In certain instances, amounts previously reported in the 2000 consolidated financial statements have been reclassified to conform to the 2001 presentation. Such reclassifications have no effect on the change in net assets or total net assets as previously reported.

(2) Economic Development Investment Fund

Through its Economic Development Finance Program, the Center supports research and development projects of young and growing biotechnology/bioscience companies that may not yet qualify for conventional forms of financial assistance. Since 1988, most awards to companies have been in the form of notes, and all amounts, including interest, are to be repaid in full within one to seven years of the date of the notes.

The Center accounts for these awards as expenses upon approval by the Executive Committee, thus recording a 100% reserve on the related notes receivable as these awards are paid out. Management of the Center does not believe it has adequate information to estimate a more precise allowance for uncollectible notes receivable since the companies' ability to repay the amounts is contingent on their ability to survive as profitable entities. The Center records revenue (note repayments) in the year the award is repaid. Note repayments of $1,034,192 and $355,235 were received in 2001 and 2000, respectively. Interest income is not recognized for financial reporting purposes until it is collected.

(3) Investments

The aggregate values of investments at June 30, 2001 and 2000 were as follows:

	2001			
	Cost	Gross unrealized gains	Gross unrealized losses	Market value
Stocks	$ 299,628	—	(86,548)	213,080
Certificates of deposit	4,150,000	—	—	4,150,000
Commercial paper	20,045,313	—	—	20,045,313
BIF	6,447,765	—	(243,449)	6,204,316
Equity investments	1,536,866	—	—	1,536,866
	$35,479,572	—	(329,997)	32,149,575

	2000			
	Cost	Gross unrealized gains	Gross unrealized losses	Market value
Stocks	$ 88,118	—	(49,929)	38,189
Certificates of deposit	2,825,000	—	—	2,825,000
Commercial paper	21,583,474	—	—	21,583,474
BIF	3,679,309	—	—	3,679,309
Equity investments	665,050	—	—	665,050
	$28,840,951	—	(49,929)	28,791,022

In connection with Economic Development Finance awards, the Center receives the right to purchase stock in various biotechnology/bioscience companies. As of June 30, 2001, the Center received warrants to purchase 176,580 common shares and 42,500 preferred shares with exercise prices ranging from $0.30 to $600 per share. These warrants expire at various dates through 2007. Value has not been attributed to these warrants; accordingly, they are not reflected in the consolidated financial statements.

As of June 30, 2001, the Center has capital contribution commitments to the BIF and various venture capital funds totaling $3,611,400. These funds will be invested in future years as capital calls are made by the various venture capital fund managers.

(4) Loan and Notes Receivable

Loan and notes receivable at June 30, 2001 and 2000 consisted of the following:

	2001	2000
Loan receivable: Loan receivable dated October 15, 1998 from Eno River Capital, L.L.C. Interest is payable along with the principal in one lump sum on October 15, 2005. Interest rate is 6.25% per year on the unpaid principal balance.	$ 75,000	75,000
Notes receivable: Notes receivable from various state biotechnology companies under Economic Development Finance awards. Interest rates on these notes vary from 6.25% to 15.00%. Generally, principal and interest are payable one to five years from the execution of the note. Due dates range from 2001 to 2008.	$ 647,851	1,314,481
Notes receivable from various state biotechnology companies under Small Business Innovation Research awards. Interest rat es on these notes vary from 8.25% to 8.50%. Generally, principal and interest are payable one to seven years from the execution of the note. Due dates range from 2001 to 2008.	157,473	129,971
Notes receivable from various state biotechnology companies under the Collaborative Funding Assistance Program. Interest rates on these notes are 8.25%. Generally, principal and interest are payable one to five years from the execution of the note. Due dates are in 2001.	40,000	60,000
Notes receivable from various state biotechnology companies under Business Development Awards. Interest rates on these notes vary from 9.00% to 11.00%. Generally, principal and interest are payable one to three years from the execution of the note. Due dates range from 2001 to 2004.	57,514	56,483
Notes receivable from various state biotechnology companies under Small Business Research Awards. Generally, principal and interest are payable one to seven years		

	2001	2000
from execution of the note. Due dates range from 2005 to 2008.	961,592	349,333
Notes receivable from various state universities under Patent Funding Assistance awards. These notes bear a flat interest fee of $2,000. Principal and interest are payable upon transfer, assignment, or license of patent for compensation.	23,583	23,583
Notes receivable from various state universities under Proof of Principle Awards. Generally, principal and interest are payable within five years, if the technology or intellectual property is sold, transferred, assigned or licensed. However, there is no interest if paid in the first year.	42,050	42,050
	1,930,063	1,975,901
Less allowance for uncollectible notes receivable	(1,930,063)	(1,975,901)
Notes receivable, net	$ —	—

(5) Property, Plant, and Equipment

A summary of property, plant, and equipment at June 30, 2001 and 2000 follows:

	2001	2000
Building	$ 7,305,069	7,270,412
Furniture, fixtures, and equipment	1,590,497	1,570,168
Construction in progress	—	44,215
	8,895,566	8,884,795
Less accumulated depreciation	3,728,583	3,443,579
	$ 5,166,983	5,441,216

(6) Grants/Contracts and Notes Payable

The Center has committed grants and contracts to various research programs, primarily through major universities and biotechnology companies located in North Carolina. Grants/contracts and notes payable at June 30, 2001 are expected to be paid as follows:

Year ending June 30,	Total
2002	$ 6,505,847
2003	1,511,284
	$ 8,017,131

(7) Interest Income

Interest income of $1,559,472 and $1,443,997 was earned during the years ended June 30, 2001 and 2000, respectively, primarily by investing in certificates of deposit and commercial paper. Interest income collected on notes and loans receivable in 2001 and 2000 totaled $228,917 and $136,909.

(8) Benefit Plans

The Center has a defined contribution money purchase pension plan covering all qualified employees who have completed one year of service. The Center's contribution is 11.00% of pre-tax compensation for eligible employees. Employees are fully vested in the plan assets upon participation. Approximately $203,000 and $169,000 was contributed to the plan during the years ended June 30, 2001 and 2000, respectively. The plan is self-directed, with the majority of participants electing mutual funds. Additionally, after six months of employment, all regular employees are eligible to participate in a 403(b)(7), tax-deferred supplemental retirement plan. Participants may contribute subject to prevailing Internal Revenue Service regulations.

The Center has a non-qualified deferred compensation plan covering a key employee. Expenses of the plan were $19,088 and $6,000 in 2001 and 2000, respectively. Assets and liabilities of the plan, which totaled $25,666 and $6,000 at June 30, 2001 and 2000, respectively, are included as assets and liabilities of the Center.

(9) Operating Leases

The Center has acquired the right to use the land on which its building is constructed through an operating lease agreement with another nonprofit organization, the Triangle Universities Center for Advanced Studies, Inc. (TUCASI). Title to the land remains with TUCASI.

Payments to TUCASI under the agreement are at the nominal rate of $1 per year, and the Center pays all costs of insurance, taxes, and maintenance as defined in the lease agreement.

(10) Subsequent Events

On July 1, 2001, the Articles of Organization were filed for the North Carolina Genomics and Bioinformatics Consortium, a wholly-owned subsidiary of the Center. The purpose of the Consortium is to bring together the key elements of research, development, commercialization and support infrastructure in North Carolina that use or develop genomics, proteomics or bioinformatics in order to plan strategic research and development initiatives, and build infrastructure, synergy and community among its associates.

The Center receives significant funding from the State of North Carolina each year. Due to budget deficits experienced by the State of North Carolina, management of the Center will receive approximately $5,270,000 in state appropriations for the 2001–2002 fiscal year. Management of the Center anticipates receiving approximately $6,270,000 in state appropriations for the 2002–2003 fiscal year.

COLOPHON

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