



NORTH CAROLINA POLICIES AND PROGRAMS

HIGHLIGHTS

- North Carolina was the first state to target the biotechnology sector for development
- The State of North Carolina invested \$1.2 billion to build the biotechnology sector between 1998 and 2008
- Today, North Carolina is home to a vibrant and growing biotechnology industry that employs 53,200 and contributes \$45.8 billion to the state's economy
- North Carolina has set a goal of having 125,000 North Carolinians employed in biotechnology-related jobs by 2023
- Efforts to develop biotechnology clusters are underway in Asheville, Charlotte, Greenville, Wilmington and Winston-Salem in addition to Research Triangle Park

North Carolina's Biopharmaceutical Industry

North Carolina is home to a highly specialized, dynamic, and growing biopharmaceutical industry.¹ More than 26,000 North Carolinians were employed in the biopharmaceutical industry in 2006, supporting a total economic output of \$25.7 billion.² These high-paying jobs have grown by 3.9 percent annually since 1996 or more than three times the annual growth rate of the rest of the state's private sector. North Carolina's biopharmaceutical firms have an active innovation pipeline with more than 3,100 active clinical trials.

Biopharmaceutical Sector Performance Measures	NC	US
Direct Employment, 2006	26,082	686,442
Direct Employment Growth (CAGR), 1996-2006	3.9%	3.1%
Average Annual Wages (Direct Employment), 2006	\$80,053	\$88,929
Total Supported Employment (incl. Direct), 2006	118,285	3,233,920
Total Economic Output, 2006 (\$ billions)	\$25.7	\$294.6
Direct Output per Direct Employee, 2006	\$467,687	\$128,925
Active Clinical Trials, 2008	3,121	21,795

Source: Archstone Consulting, *The Biopharmaceutical Sector's Impact on the U.S. Economy*, prepared for PhRMA, 2009.

CAGR = Compound Annual Growth Rate

North Carolina's Approach to Growing the Biopharmaceutical Industry

The state of North Carolina was the first U.S. state to target the biotechnology sector for economic development. In 1984, the state created the North Carolina Biotechnology Center (NCBC), a private, nonprofit organization charged with promoting biotechnology research, education, and business. The budget and programs of NCBC have grown during the past 25 years, but the mission remains the same: "to provide long-term economic and societal benefits to North Carolina through support of biotechnology research, business, education and strategic policy statewide."³

North Carolina believes that nurturing the biotechnology sector helps attract high-wage, skilled jobs to the state while at the same time developing products that benefit the state's citizens. Between 1998 and 2008, North Carolina invested \$1.2 billion to grow the state's bioscience sector. Of the total:

- \$857 million was invested in research and facilities
- \$135 million was invested in workforce training
- \$115 million was invested in the NCBC
- \$102 million was provided as direct incentives to companies.⁴

Although North Carolina has had great success in developing a biopharmaceutical cluster in the Research Triangle Park region, the state was concerned that other regions were not growing their technology sectors. In 2004, North Carolina adopted a long-term strategic plan to guide the future of the state's investment in biotechnology.⁵ The *New Jobs Across North Carolina* plan proposed 54 strategies and set a goal of having 48,000 North Carolinians employed in biotechnology-related jobs by 2013 and 125,000 by 2023. The attraction and expansion of biomanufacturing in the state was the top priority. The strategy also called for developing the biotechnology industry in all regions of the state. Initiatives are underway to develop the biopharmaceutical sector in Asheville, Charlotte, Greenville, Wilmington, and Winston-Salem, in addition to continuing to grow the biopharmaceutical sector in Research Triangle Park.

North Carolina's investments have paid off. A recent Economic Impact Analysis commissioned by NCBC found that the state's bioscience industry sector, which includes

agricultural feedstock and chemicals; research, testing and medical labs; drugs and pharmaceuticals; and medical devices, added \$45.8 billion to the economy and generated \$1.44 billion in state and local taxes in 2006.⁶ The report also cited favorable tax and financial incentives as key mechanisms for attracting biopharmaceutical companies. North Carolina offers, for example, an R&D tax credit equal to 20 percent of expenses to companies whose expenses have been with a North Carolina university.

“Economic development in North Carolina has always been guided by three core beliefs: progress, education and innovation. Our state’s biotechnology industry has been built on these beliefs. Today, it is an essential economic engine that can benefit all North Carolinians.”

Governor Michael Easley
Governor of North Carolina
New Jobs Across North Carolina: A Strategic Plan for
Growing the Economy Through Biotechnology

“For the past year, the Biotechnology Center and our partners have continued our deliberate development of a statewide life sciences community and implementation of a specific vision: **high-paying biotechnology jobs accessible to all 100 counties in North Carolina.**”

E. Norris Tolon
President and CEO, NCBC
NCBC 2008 Annual Report

Major State Initiatives to Attract and Grow the Biopharmaceutical Industry

North Carolina Biotechnology Center (NCBC)

NCBC has developed a comprehensive set of programs to support and accelerate the development of the state’s biotechnology industry sector. The Center administers a number of grant programs that:

- Provide direct support for bioscience R&D
- Provide support to universities to recruit scientific talent, purchase core equipment, or support development of technologies with commercial potential
- Make loans to support bioscience entrepreneurs and start-up and emerging bioscience companies
- Provide grants to support bioscience education programs.

NCBC will be funded at \$14.8 million in FY 2010 and \$14.5 million in FY 2011, a decrease of \$1.5 million from the FY 2007–2008 budget. The Center has 60 employees.⁷

The 2009 economic impact study found that:

- Companies funded by NCBC between 1989 and 2008 have been able to match their Center funds by a ratio of \$99:\$1, usually from private risk capital sources
- The Center’s support helped add 57 high-profile bioscience researchers to the faculty between 1986 and 2009 who have, in turn, attracted \$510 million in external research funding
- The total academic bioscience R&D base reached \$1.31 billion in 2007
- Since 1987, more than 1,666 educators have been trained in biotechnology laboratory techniques by the Center and over \$5.1 million in training grants have been provided.

NCBC Researcher Developing New Vaccines

Last year a North Carolina scientist received a \$72,497 research grant from NCBC. She is using the funding to develop a unique strategy to stop the spread of monkeypox, a relative of smallpox. The virus spread from prairie dogs to humans in a 2006 epidemic. By removing a specific gene that affects immunity, she’s attracting increasing scientific acclaim for her approach. It holds promise not only for improving the safety and effectiveness of poxvirus vaccines, but also for killing other viruses such as coronaviruses, which include the human Severe Acute Respiratory Syndrome (SARS) virus.

NCBC 2008 Annual Report

A North Carolina Success Story

Anne-Marie Stomp, Ph.D., was recruited to North Carolina State University, in part with funding provided by NCBC. When she began studying duckweed instead of trees, she hit upon a faster way to produce proteins.

The technology she developed was licensed to create a clinical-stage biopharmaceutical company, which received a \$100,000 loan from the Biotechnology Center early in its development. The company has gone on to bring in more than \$173 million in venture capital investments, and it employs 100 people.

NCBC 2008 Annual Report

North Carolina BioImpact

NCBioImpact, created in 2003 with a grant from the Golden Leaf Foundation, is a joint undertaking of NCBC, the North Carolina Biosciences Organization, the North Carolina Community College System, and the University of North Carolina System that works to ensure that North Carolina can meet the talent needs of the biopharmaceutical sector. It includes three components:

- **BioNetwork** is a statewide initiative that connects more than 20 community colleges and includes six specialized centers with training for specific aspects of biotechnology.
- **Biomanufacturing Training and Education Center (BTEC)** is an 81,000-square-foot biomanufacturing training and education facility at North Carolina State University. The pilot-scale production plant provides advanced, hands-on training and education for students and current workers.
- **Biomanufacturing Research Institute and Technology Enterprise (BRITE)**, located at North Carolina Central University, provides degree programs and laboratories for scholars conducting research in several areas critical to biotechnology and biomanufacturing.

Drug Discovery Center of Innovation

The Drug Discovery Center of Innovation, which received a \$100,000 planning grant from NCBC in 2009 to develop a business plan, is proposed to be a multi-institution public-private partnership coordinated by The Hamner Institutes for Health Sciences. The Hamner Institutes is a private, nonprofit translational research organization in Research

Triangle Park that receives support from private corporations and federal agencies. The Center, which will initially focus on oncology, will seek to accelerate the development of new, safer drugs as it links cutting-edge research in North Carolina academic institutions with the needs of biotechnology and pharmaceutical companies. In addition to Hamner Institutes, project partners include the Center for Integrative Chemical Biology and Drug Discovery at the University of North Carolina-Chapel Hill, the College of Management at North Carolina State University, and BRITE at North Carolina Central University. Once a business plan has been developed, the Center will be eligible to apply to NCBC for \$2.5 million over 4 years to implement the plan. The Center is expected to become self-supporting.

Piedmont Triad Research Park

Winston-Salem's efforts to develop a biopharmaceutical industry cluster focus on development of the Piedmont Triad Research Park (PTRP). The Park, 200 acres in Winston-Salem's downtown, is anchored by a new biomedical research campus for Wake Forest University Health Sciences (WFUHS) and other educational facilities. PTRP's first commercial building was completed in 2000 and leased to Taracept, a homegrown biopharmaceutical company. The Biotechnology Research Facility 1 opened in 2006 and houses WFUHS's Institute for Regenerative Medicine and the Lipids Sciences program. The PTRP Wet Lab LaunchPad opened in 2007 to provide affordable laboratory space for emerging bioscience companies. In 2009, NCBC provided funding to the Wake Forest University Babcock Demon Incubator Wet Lab to upfit the lab with shared-use equipment. The Park includes six buildings totaling 554,000 square feet of wet lab, office, meeting, and residential space, and is home to 41 life science companies as of 2009.

¹ The biopharmaceutical sector is defined as including pharmaceutical and medicine manufacturing and scientific research and development services.

² Archstone Consulting, *The Biopharmaceutical Sector's Impact on the U.S. Economy*, prepared for PhRMA, 2009.

³ North Carolina Biotechnology Center Web Site, www.ncbiotech.org/about_us/mission_and_goals

⁴ *North Carolina Biotechnology Center, 2008 Annual Report*.

⁵ *New Jobs Across North Carolina: A Strategic Plan for Growing the Economy Statewide Through Biotechnology*, January 2004, http://www.ncbiotech.org/biotechnology_in_nc/strategic_plan/Strategicplan.pdf.

⁶ *Evidence and Opportunity: Biotechnology Impacts in North Carolina*, prepared by Battelle for the NCBC, November, 2008, www.ncbiotech.org/biotechnology_in_nc/battelle/battelleReport111708.pdf.

⁷ "Life Science-Related Provisions 2009 – 2001 North Carolina State Budget, NCBC, www.ncbioscience.org.

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