

# THE PROGRAM

North Carolina ranks among the top three biotechnology regions in the United States. Bioprocess manufacturing, the fastest growing sector of the state's biotech industry, currently employs 4400 workers. Another 16,000 work in general pharmaceutical manufacturing and nearly 17,000 North Carolinians work in contract research and consulting firms that serve the pharmaceutical industry.

The biotechnology and pharmaceutical sectors of North Carolina's economy are poised for further growth. More employees are needed with education and training that will make them immediately productive. In manufacturing facilities alone, it is estimated that North Carolina biotechnology and pharmaceutical companies will need as many as 2,500 new hires a year-but fewer than 600-800 students and workers are now trained annually.

The Biomufacturing and Pharmaceutical Training Consortium combines the resources of North Carolina's university and community college systems to meet the growing demands of the biotechnology and pharmaceutical industries. Together, the Consortium's three principal training programs will provide students and incumbent employees experience with industrially relevant instruments and processes, large-scale manufacturing equipment and clean room environments, and training in current Good Manufacturing Practices (cGMPs). The Consortium's unique collaborative structure brings together both academic excellence and state-of-the-art training to make North Carolina a national leader in biotechnology, pharmaceutical and life science-related manufacturing.

"The BTEC will be a significant and new contributor to statewide education, economic development, and job creation in the biomufacturing, pharmaceutical, and related agribiotechnology industries in North Carolina. This education and training exists nowhere in the country and should serve as a magnet for new business expansions and relocations by these critical sectors of our State's economy"

Dr. Peter Kilpatrick | Director BTEC



BRITE's education and training programs will evolve from full collaboration and cooperation with the biomufacturing industry to ensure that BRITE graduates possess the knowledge and skill sets that will make them highly competitive for jobs within the industry.

Dr. Ken Harewood | Interim Director, BRITE

BioNetwork has assembled a world-class team of industry leaders and specialists to offer its statewide community college training programs. These cutting-edge programs provide a competitive advantage to NC biopharmaceutical companies by meeting their workforce needs.

Susan Seymour | Director of NCCCS BioNetwork

# BIONETWORK



**North Carolina Community College System, (NCCCS), statewide.**

## WHAT IS BIONETWORK?

A network of 44 community colleges serving 80 counties across North Carolina, sharing information, resources & curricula to provide specialized workforce development for the biotechnology, pharmaceutical and life sciences industries. ([www.ncbionetwork.org](http://www.ncbionetwork.org))

## FEATURES:

NCCCS offers state-supported customized training for new and expanding companies, and is one of the world's largest continuing education programs. North Carolina community colleges provide pharmaceutical and biotechnology-related curricula and coursework statewide.

Six Centers specialize in bioprocessing, pharmaceuticals, bioagriculture, bioeducation, biobusiness, and capstone clean room and aseptic process training.

Students and workers will receive the bulk of their education at local community colleges and obtain finishing training on industry-scale process equipment in the dedicated community college aseptic suite in the Biomufacturing Training and Education Center (BTEC) at North Carolina State University.

BioWork, a nationally recognized 128-hour, entry-level process technician training course is offered at eleven North Carolina community colleges statewide.

The National Center for the Biotechnology Workforce, at Forsyth Technical Community College, is funded by a \$5 million grant from the U.S. Department of Labor.

*"The strength of North Carolina's community college training system was an important consideration in Merck's decision to locate our new vaccine manufacturing facility in Durham, NC. Merck is confident that the community college system will help ensure that we have a highly trained work force in place when the facility becomes operational in 2008."*

-- Raymond V. Gilmartin, Then Merck CEO



# BIOMANUFACTURING RESEARCH INSTITUTE AND TECHNOLOGY ENTERPRISE (BRITE)

**North Carolina Central University, Durham, NC**

## WHAT IS BRITE?

A biomufacturing and pharmaceutical educational and training facility complete with state-of-the-art laboratories and classrooms designed to develop a cadre of employees for the biomufacturing industry. ([www.nccu.edu/BRITE](http://www.nccu.edu/BRITE))

## FEATURES:

BRITE will offer research education and training in biotechnology and biomufacturing for students at the BS, MS, and PhD levels. BRITE will offer hands-on training in process analytical technology and development, quality assurance and quality control.

Interdisciplinary biology and chemistry concentrations will provide a solid foundation in the sciences and specialized education in biomufacturing competencies. Coursework will include microbiology, biological techniques, analytical chemistry, cell culture, purification, and bench scale process development.

BRITE will build on North Carolina Central University's successful investment in the Julius L. Chambers Biotechnology/Biomedical Research Institute, with its existing expertise in assay development, macromolecular separation, data management and other technology areas.

BRITE's academic program will interface throughout the region to provide collaborative technical and logistical support for biomufacturing.



# BIOMANUFACTURING TRAINING AND EDUCATION CENTER (BTEC)



**Centennial Campus, North Carolina State University, Raleigh, NC**

## WHAT IS BTEC?

A biomufacturing training and education facility to provide students with hands-on experience using commercial-scale equipment in clean room environments. ([www.engr.ncsu.edu/btec](http://www.engr.ncsu.edu/btec))

## FEATURES:

BTEC will offer large-scale equipment, including bioreactors, downstream separation and purification processes, bioreactor control systems, and aseptic processing operations.

The facility will house an education and training laboratory for biotechnology support staff: validation specialists, instrumentation technicians, equipment mechanics, microbiologists, sterile preparation technicians and biochemists.

Researchers will have access to cutting edge scholarship to develop next generation bioprocessing and biomufacturing technologies.

The pilot manufacturing plant will offer a full spectrum of cell culture and biotechnology expression platforms.

Educational opportunities will exist at all levels, from short courses for adult certification and continuing education to BS, MS and PhD, with emphasis on cGMPs and industry standards.

Students will have access to distance education via videoconferencing and online instruction.



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## NORTH CAROLINA PREPARED FOR THE FUTURE.

*Beginning in 1981, North Carolina courted the biotechnology and pharmaceutical industry with the promise of a fertile business climate.*

## THE FUTURE IS HERE.

*North Carolina is the third largest biotechnology state in the country (Ernst and Young, 2004) and the Raleigh-Durham-Chapel Hill area is the third largest biotech metro region (Milken Biotech Index, 2004).*

## NOW IT'S TIME FOR THE NEXT STEP.

*Continued expansion of the biomanufacturing sector has increased the need for fully trained, job-ready biomanufacturing employees. North Carolina's Golden LEAF has committed \$60 million to address this need. The effort has also received several million dollars in federal grants and industry donations. Three programs, known jointly as the Biomanufacturing and Pharmaceutical Training Consortium (BPTC), form the centerpiece of this statewide effort.*



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THREE PROGRAMS  
THREE INSTITUTIONS  
ONE GOAL



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THREE PROGRAMS THREE INSTITUTIONS  
ONE GOAL

BIOMANUFACTURING AND PHARMACEUTICAL  
JOB-READY EMPLOYEES,  
DAY ONE.