The State Board of Community Colleges

The North Carolina Community College System Office

A Report to the Joint Legislative Education Oversight Committee
of the
North Carolina General Assembly

Report on the NCCCS BioNetwork
Required by Section 8.6 of the Session Laws 2006-66

Office of the President

BioNetwork
The Division of Economic and Work Force Development

November 2006

Introduction

The 2005 Session of the North Carolina General Assembly recognized the importance of the biotechnology-related industry to the economic growth of the state and provided an appropriation of funds to the North Carolina Community College System Office (NCCCS) BioNetwork initiative.

Reporting Requirement

In addition to the appropriation made by the 2006 Session Laws, the General Assembly imposed a reporting requirement upon the NCCCS about the BioNetwork activities, achievements, and expenditures of these funds. This Section 8.6 is stated as follows:

The Community Colleges System Office shall report by November 1, 2006, to the Joint Legislative Education Oversight Committee, the Office of State Budget and Management, and the Fiscal Research Division on the explanation of the BioNetwork's activities, achievements, and expenditures. Section 8.6.(e)

It is the purpose and intent of this report to comply with the directive of the General Assembly.

Table of Contents

Executive Summary
BioNetwork: An Initiative of the North Carolina Community College System

This report is provided to the Joint Legislative Education Oversight Committee, the Office of State Budget and Management, and the Fiscal Research Division as required by Senate Bill 1741, Section 8.6. The activities, achievements, and expenditures detailed in this report show achievements since the starting effective date of the initiative, March 1, 2004. Startup funding was provided by Golden LEAF in the amount of $8.7 million dollars. Some portions of this funding overlapped the first year of state appropriations and the funding was integrated in the program activities.

BioNetwork is important to the state of North Carolina because it serves as a catalyst for both economic and workforce development. This initiative provides a well-trained workforce for the North Carolina's rapidly growing biotechnology industry sector and assists dislocated and incumbent workers in finding training that leads to satisfying, well-paid jobs. Providing well-trained workers that biotechnology-related companies are seeking and the training that potential workers need is a significant accomplishment of BioNetwork.

The Significance of the North Carolina Biomanufacturing Industry Cluster

Over the past decade, the North Carolina biomanufacturing industry cluster has grown to be the third largest in the country. This cluster includes the world's largest industrial enzymes manufacturing plant (Novozymes North America in Franklinton), the nation's largest vaccine manufacturing plant (Wyeth Vaccines in Sanford), one of the country's largest mammalian cell-based biomanufacturing facilities (Biogen-Idec in the Research Triangle Park), the area's largest vaccine discovery lab (Merck in Durham), and a host of other large and small facilities. North Carolina is also home to one of the largest pharmaceutical clusters in the world, including such major companies as GlaxoSmithKline, Eisai, DSM. Additionally, North Carolina hosts one of the most developed agriculture-based economies, including being among the top producers in the country of tobacco, sweet potatoes, processed chickens and swine, herbs, and natural products.

The Importance of Biotechnology Economic Development to North Carolina

According to Site Selection magazine, the number one factor in determining the location for a manufacturing facility is the availability of a well-trained workforce. The promise in North Carolina is that, with support of the development of a trained biotechnology workforce, this industry cluster will grow with expansions, relocations, and new companies. Additionally, it is expected that related food products, nutraceuticals, and other value-added plant-based materials will further contribute to North Carolina's emergence as the hub of a regulated industry of enormous economic potential. North Carolina hosts over 225 bioscience-related companies that together employ more than 34,000 employees and generate about $8 billion in annual revenue. The biopharmaceutical industry taxation statistics, according to the Milken Institute October 2004 report, show

- Personal Income Tax Revenues at $1.3 Billion (State, Local, Federal)
- Industry Contribution
    - Total Sales Revenue of $17.7 Million From Product Sales and Related Consumer Purchases
    - Corporate Income Taxes of $140.8 Million

The Need for Advanced Training and Education

The most essential component in stimulating the biomanufacturing and biotechnology cluster in North Carolina is the development of the workforce. North Carolina holds the distinction of offering the oldest biotechnology associate degree program in the country (more than twenty years). An important piece of this has been education and training of students and potential employees in the operation of equipment and processes that are peculiar to manufacturing in a Food and Drug Administration regulated environment producing biological products that will be injected into or ingested by humans. This type of manufacturing places unusual demands on the workers. They must understand and experience the culturing of microorganisms and cells at large scale and in equipment of scale and construction materials appropriate to manufacturing. They must learn the methodologies associated with producing, purifying, and characterizing biological macromolecules that are used as therapeutics or have other commercial applications.

BioNetwork

The mission of the BioNetwork initiative is to:

- Act as a primary economic development catalyst for North Carolina;
- Provide a continuous supply of trained new workers;

- Give dislocated workers new skills;
- Allow career changers to enter the biotechnology field; and
- Upgrade the skills of incumbent workers at all levels.

BioNetwork consists of a management staff at the Community College System office, six BioNetwork Competitiveness Centers, and funds for Innovations and Equipment. Innovation Funds allow development of curriculum for new applications, new techniques, new delivery methodologies (such as nutraceuticals and nanotechnology), and learning objects for distance education. Equipment funds allow specialized laboratory equipment and lab upgrades to keep pace with changing industry needs and technologies.

BioNetwork Curricula

BioNetwork community colleges across North Carolina offer a broad range of short courses, modular programs that can be aggregated to achieve recognized credentials, credit by experience, certificate, diploma, and associate degrees. Along with courses in microbiology, general chemistry, organic chemistry, applied physics, biochemistry, genetics, and cell culture, specialized community college laboratories give students and workers hands-on experience in separation technologies (extraction, precipitation, ultrafiltration, and chromatography), spectrophotometric techniques, pharmaceutical manufacturing processes, immunological techniques, and bioprocessing instrumentation. Courses in industrial safety, statistical quality control and the industrial environment, process/product validation and quality, industrial standards and regulation, and nanotechnology are also offered. These curricula will smoothly integrate with the course offerings at NC State (BTEC), NCCU (BRITE) and other public and private universities.

Progress To Date

The NCCCS BioNetwork Central Office is staffed and operational along with its Industry Advisory Board and partnerships with NC Department of Commerce, ISPE, industry, universities and the NC Biotechnology Center. The grant management and initiative evaluation processes are established and functioning and include the awarding of over $9.2 million in grants to local community colleges; the establishment of all protocols, instrumentation, and databases; the collection of baseline quantitative and qualitative data; and the creation of timelines for analysis of data and presentation of findings. BioNetwork Centers are staffed and are involved in curricular/protocol development, Train-The-Trainer opportunities at BioNetwork colleges, and technical assistance to all BioNetwork Innovation and Equipment grantees. The BioNetwork Capstone Center is fully functional in interim training facilities offering student/worker training for cleanroom operations and aseptic processing (sterile filtration, aseptic sampling and aseptic filling). This faculty is developing Types I, II, and III Cleanroom and Aseptic Processing curricula, as well as, Microbial Identification training curricula requested by local industry. Trainees/workers will follow standard operating procedures and document all work. The custom-designed mobile laboratory offers accelerated laboratory-based incumbent worker training for companies on-site and at rural community colleges.

NC community colleges have been awarded 100 grants for Center implementation, Innovations, or Equipment and Related Facility Enhancement. Innovations which were funded to accelerate growth and improvement include establishing industry skill standards, creating learning alliances for benchmarking best practices, developing new strategies for student recruitment and retention, improving back-to-industry experiences for faculty, expanding university articulation agreements, and modularizing curriculum courses into specialized units offered to incumbent workers. These innovations are being shared with community colleges across the state. Some of the new innovations include Good Manufacturing Practices (GMP) Courses (Basics of cGMP and Process Management, Training for cGMP, and cGMP Auditing); Quality Assurance offered online (QA Fundamentals, cGMP, Quality Systems); Operations in Biotechnology Processes (fermentation, product isolation and purification of a protein); packaging engineering; industrial microbiology; contamination control; cross-disciplinary biotechnology science electives; Genetics; Viticulture; Aquaculture and Agriculture Biotechnology with focus on laboratory techniques and tissue culturing. Nineteen colleges offer twenty biotechnology-related curriculum programs. Thirty-two community colleges were awarded Equipment and Related Facility Enhancements funding to keep pace with changing industry needs and technologies, upgrade equipment, achieve economies of scale, and to encourage the support of new and expanding industries by spreading biotechnology student/worker training into new areas of the state.

In 2005-2006, professional development was a strength area of BioNetwork. The advent of the BioForum Conference sponsored by BioNetwork meant that staffs of all the projects received strong, focused professional development opportunities in a state venue. Overall, the quality of the 2006 BioForum sessions was evaluated very highly by participants.

BioNetwork's recruitment campaign promotes the educational and training opportunities to provide workers needed by industry. In addition to a web presence, this campaign includes radio, television, and print advertising. A Distance Learning Model has been established to prototype biotechnology training via the Internet prior to the opening of the BTEC. BioNetwork will connect additional community colleges as funding allows. BioNetwork Career Fairs match trained students and re-skilled workers with jobs in the expanding biotechnology companies.

Recruiting Students and Marketing for Prospective Companies

The marketing of BioNetwork and recruiting of students into BioNetwork Community Colleges has been a critical part of the initiative. A fundamental part of the need for the initiative is to grow the numbers of graduates being produced by community colleges statewide. Marketing and recruiting for this industry sector has focused on breaking down the stereotype that to work in biomanufacturing, one has to have a PhD. Breaking these stereotypes has enabled many people laid off from traditional manufacturing to not self-limit themselves and enroll in biotechnology and related programs. This high-profile student recruiting campaign has enabled BioNetwork to raise awareness about the good, well-paying jobs available and create opportunities for citizens by changing perceptions about the qualifications needed to find employment in pharmaceutical or biomanufacturing. Additionally, because of the high-profile nature of the student recruiting campaign, it has given economic recruiters a valuable marketing tool to strengthen North Carolina's case as a prime location for new biotechnology business. By showcasing the highly-specialized training offered through BioNetwork, the marketing addresses one of the critical issues site-selection consultants consider – where to find trained workers for this highly-regulated sector. The recruiting campaign says that this state is serious about growing the workforce pipeline for this sector. In similar fashion, marketing campaigns about the competitive advantage that BioNetwork provides to North Carolina biotechnology companies raises awareness about jobs in this sector.

The BioNetwork website is at the center of all of the marketing, recruiting, branding and communications in the initiative. All of the TV and radio recruiting public service announcements send prospective students to the site. At the site is information on all of the courses and Associate Degrees offered with links to the local community colleges offering them. The TV public service announcements are posted on the site with the story behind the people who are featured in them. These are real people whose lives have been transformed by the biotechnology education they have received at community colleges and who are employed in the biotechnology sector. Information about the education and training offered on the BioNetwork website also serves to market the state to companies beyond North Carolina's borders. All prospect companies need to do during the research phase on where they'll find the workers for their new facility is compare the programs offered through BioNetwork with what's offered elsewhere – the results make for a compelling argument to come to North Carolina.

All marketing and recruiting materials were created in digital formats, making it easy to share. Materials such as brochure-quality pictures are located for easy access by community college public information officers on a secure portion of the site. By making recruiting materials available to public information officers statewide via the website, branding, recruiting and marketing of the initiative can be leveraged broadly, significantly increasing the impact of the System Office marketing budget.

Achievements of BioNetwork in its two and one half years of existence

- Awarded Grants to Local Community Colleges
  - 6 Competitive Center grants for $2,715,817
  - 30 Innovation grants for $920,031
  - 64 Equipment grants for $5,566,217

  which have directly impacted 37 NC community colleges and 65 counties and indirectly impacted (through 1+1 partnerships) an additional 14 NC community colleges and 25 counties
- Built a Solid Infrastructure with
  - 38,000 square feet of dedicated space
  - Supported 23 new or retrofitted labs
  - Funded $3 million dollars in installed equipment
  - Involved 200 college science faculty/staff
  - Impacted the learning of 5712 students
- Supported supplemental fundraising
  - Center staff obtained an $463,000 in additional grants

- Non-center grantees raised $734,000 in additional grants with 61% of the proposals being successful
- Local colleges leveraged funding >$12 million additional funding

- Supported Instruction
  - 38 new courses were developed or revamped by Innovation Fund projects
  - 57 courses (new or revamped) were enhanced by the use of new BioNetwork-funded equipment
  - Funded equipment supported
  - K-12 emerged as a significant pipeline of future workers
  - The country's first BioAgriculture program was approved
  - 16 of the new courses had web enhancements
  - 12 new courses were developed for online distribution
  - Other support was developed for student support including videos and lab assistants·
  - Faculty enhancements were offered
  - Enrollment was increased in specialized training for workers and students
  - New community colleges approved for biotechnology-related programs (six colleges to 17)
  - New colleges offering BioWork (six colleges to 13)
  - Train-the-Trainer programs were offered for new courses
  - Distance Learning equipment installed at 12 colleges
  - The Validation Academy has been created and course materials are being designed for validation employee training
- Raised awareness of the Community College System and BioNetwork targeting potential companies, incumbent workers and prospective students in the following ways.
  - Produced 7 television PSAs shown statewide
  - Created radio student recruiting PSAs
  - Placed BioNetwork and the Community College System in six state and national publications
  - Created brochures and informative placemats for the NC Legislative Cafeteria
  - Created an informational video for visiting site selection business executives
  - Developed a media-rich web site with a secure portion providing resource sharing capabilities for local colleges statewide
  - Implemented print advertising in publications promoting NC as a place to locate biotechnology business, including BIO News, Bioprocess International, North Carolina magazine, Our State, Small Business Guide, Triangle Business Journal, Employment Guide
  - Represented the NCCCS and BioNetwork with a series of OpenNet programs
  - Created a branding campaign for the initiative to unify marketing and media relations
  - Produced a BioNetwork brochure in Japanese for use by the NC Department of Commerce's Tokyo bureau for recruitment.
  - Wrote Media releases
  - Presented on BioNetwork Today, a weekly 5-minute radio show on State Government Radio highlighting the initiative, with interviews of faculty, industry and other partners from across the state.
  - Created an image bank comprising of high-resolution science, biotechnology and laboratory pictures for use statewide in brochures and displays by community college public information officers, graphics designers and faculty
  - Organized a video pool of footage for use by public information officers statewide for to create material on biotechnology
  - Produced informational placemats in the NC legislative cafeteria
  - Designed and utilized a portable display for conferences and career fairs

- Supported the following new/expanding economic development prospects that selected NC
  - GlaxoSmithKline - $92 million expansion in Zebulon, creating 200 new manufacturing jobs
  - Merck & Co. - $300 million vaccine-manufacturing plant in Durham that will employ 200 people
  - Biolex - doubled its clinical biomanufacturing facility in Pittsboro, doubling its workforce to 100
  - Stiefel Research Institute - relocating a facility to RTP, creating 200 jobs, investing more than $50 million
  - Corneal Solutions Corp. – relocating a facility to Moore County, creating 75 to 100 jobs
  - Talecris - $127 million expansion creating 150 new jobs
  - Novo Nordisk - $100 million expansion adding 80 new production jobs

- Novartis – a new $500 million vaccine plant in Holly Springs bringing as many as 400 new jobs

Future Additional BioNetwork Responsibilities

Upcoming events include, but are not limited to, the following.

- The BioNetwork Mobile Laboratory
  - Travel/instruction according to a heavily-booked schedule
  - Continued equipment selection, acquisition, and installation
  - Planning of Mobile Lab Support facility in the BTEC at NC State
- BTEC completion
  - Completion of the building including NCCCS dedicated space
  - Transition of equipment and instruction from the Capstone Center interim facility to the BTEC
  - Usage, utility, aseptic suite maintenance, space sharing, and financial agreements with NCSU
- Support of economic development efforts with prospect companies considering site selection/expansion in NC
- Continued interaction and technical assistance with the NC Research Campus in Kannapolis
- Second Annual BioNetwork BioForum, April 2-5, 2007
- Significant expansion of the Distance Learning Model
- Participation in the Annual BIO Conference and related economic development activities
- Rollout of the BioNetwork Validation Academy
- Rollout of Bioprocessing in the Workplace
- Publication of the FY 2006-2007 Request for Proposals for BioNetwork grants

BioNetwork has grown into a very large initiative serving 51 of the 58 Community Colleges and 90 of 100 North Carolina counties. The BioNetwork initiative is the leading network for biotechnology training in the country; is the most important project the community college system has undertaken in the past forty years; and offers the potential to provide a model for other sectors such as plastics, health care and automotive. Support at the level necessary for success is critical for North Carolina to allow BioNetwork to continue existing strategies, to maintain a state leadership role in biotechnology education and training, to continue to impact industry site selection decisions benefiting NC, and to take the initiative to the next level as needed by the industry.

Appendix One

Quotes Referencing Significance of BioNetwork

"The Community College System and BioNetwork are key partners in our economic development efforts. When on recruiting trips or with biomanufacturing clients, we always hear that North Carolina's training system for biotechnology workers provides a major competitive advantage. The training programs and BioNetwork's responsiveness during the recruiting process helped North Carolina win the Novartis project"

"Around the world, companies really sit up and lean forward and start taking notes when we talk about the training collaborative that we have put in place, anchored by Bionetwork"
Secretary James Fain, NC Department of Commerce

"In my experience, it is difficult to identify a component on North Carolina's biotechnology community that is more critical to our ability to attract and retain companies in this space than the BioNetwork and related workforce training programs within the Biomanufacturing and Pharmaceutical Training Consortium (BPTC). BioNetwork represents a unique asset to the state that gives North Carolina a vital competitive advantage that is recognized the world over by life science companies."
Bill Bullock, Bioscience Industrial Development Director, NC Biotechnology Center

"The fact that we can have instantaneous workers was absolutely essential. It was the main reason why we picked North Carolina".
Novartis CEO, Joerge Reinhardt, speaking alongside Governor Easley at the announcement of the Novartis facility at Holly Springs, NC

"We're currently expanding within our facility. That's going to require some very specialized needs in our workforce. We'll be able to work with Bionetwork again to fill those openings."
Terry Novak, Senior VP for Business, Marketing and Sales Management, DSM Pharmaceuticals, Inc.

"We looked at five different states and two countries to locate our company from Atlanta. And we chose North Carolina. We've been able to recruit 80% of our employees from North Carolina. We couldn't do this outside of the northeast or California. "
Tony Laughrey, President & CEO, KBI Biopharma in a comment about BioNetwork role in NC

"The strength of the NC Community College training system was an important consideration in Merck's decision to locate our new vaccine manufacturing plant in Durham."
Raymond Gilmartin, then Merck CEO

"I meet often with industrial prospects, with people who are considering North Carolina as the location for their biomanufacturing facilities. They repeatedly say, 'We haven't seen anything like this anywhere else in the country. And if we make a decision to come to North Carolina, it would be because of you.' "
NCCCS President Martin Lancaster – commenting on BioNetwork

"The mission of BRITE is to establish programs to educate students with the scientific competency to work in the pharmaceutical and biomanufacturing industry in B.S., M.S., and Ph.D. levels. In the last year, North Carolina Central has established articulation agreements with 17 community colleges to transition students with associate degrees into the junior year of the BRITE program. Currently, we have recruited top students from community colleges at Wake Tech, Durham Tech, and other community colleges in North Carolina with BRITE scholarship awards. The partnership between BioNetwork and BRITE is vital for the success of the BRITE program and the Biomanufacturing and Pharmaceutical Training Consortium as a whole in workforce development."
Li-AN Yeh, Director, Biomanufacturing Research Institute and Technology Enterprise (BRITE), NCCU

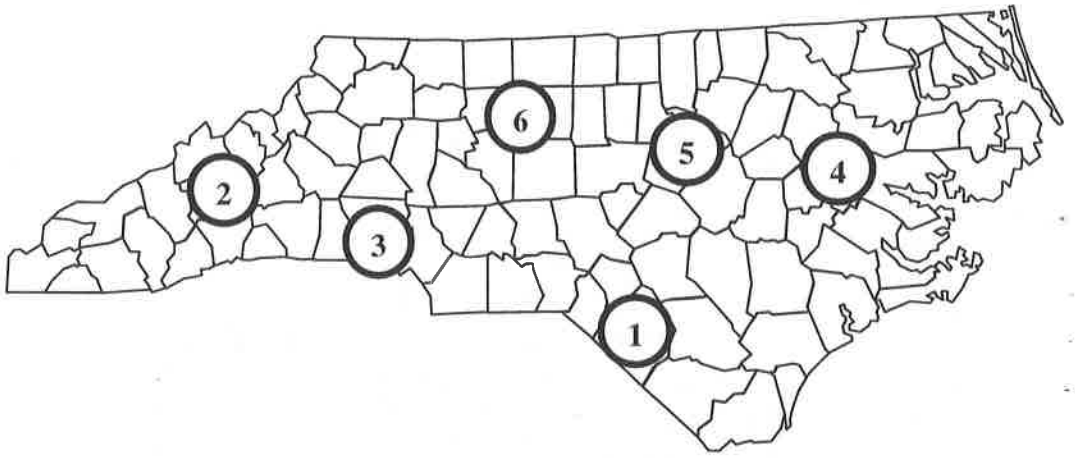
"BioNetwork has developed a very strong collection of programs in training and educating students and incumbent workers in essential applied biotechnology and biomanufacturing skills. Their aseptic and sterile fill and finish courses at the Wake Tech Capstone Center are world class and offer unique training in these essential skills needed for formulating biopharmaceutical dosage forms. Their courses in bioreactors and bioprocessing are similarly world class and are contributing greatly to positioning North Carolina as the national leader in workforce preparedness for the biotechnology and related industries. BTEC and NC State are extremely pleased to be working collaboratively with BioNetwork to develop a seamless collection of programs that students and incumbent workers can access to obtain degrees and training at all levels for this important sector of our economy."
Peter Kilpatrick, Director, Biomanufacturing Training and Education Center (BTEC), NCSU

NC Counties Served by **BioNetwork** Awards and **Partnership Colleges (1 + 1)**

37 Colleges Served Directly, 14 Additional (1+1) Partnership Colleges Total Colleges Served = 51
65 Counties Served Directly, 25 Additional Counties served by (1+1) Partnership Colleges Total Counties Served = 90
Dark grey represents counties directly served by BioNetwork; light grey represents counties in 1+1 Partnerships.

Appendix Three

BioNetwork Centers



BioAg Center 1
Hosted by Robeson Community College
New work includes:
Development of New BioAg Training Program
New BioAg Program Focal Areas
Biofuels, Plant Products, Aquaculture,
Forestry, Livestock Applications,
Micropropagation, Viticulture,
BioAgritourism

BioBusiness Center 2
Hosted by Asheville-Buncombe Technical Community College
New work includes:
Prototype Life Science Incubator
Mini Business Resource Collections
BioBusiness Service Hubs
Expanded Service for Life Science Startups
Biotechnology for the Non-scientist

BioEd Center 3
Hosted by Gaston College
New work includes:
NC Research Campus Project
Credit for Biotechnology Work Experience
Faculty Enhancement for Distance Learning Strategies
Multimedia Delivery for Course Components
BioWork Train-the-Trainer

Bioprocessing Center 4
Hosted by Pitt Community College
New work includes:
Bioprocessing in the Workplace
Focus on Other Jobs in the Biotechnology Cluster
e.g. Industrial Service Technician
Tracks of Training including
Fermentation, Separation Technologies
Development of Advanced High-level Capstone Courses for Curriculum and Continuing Education

Capstone Center 5
Hosted by Wake Technical Community College in collaboration with all RTP-area Community Colleges
New work includes:
Transition to New Facility
Capstone Experience
Biotechnology and Pharmaceutical Programs

Pharmaceutical Center 6
Hosted by a collaboration of Forsyth Technical Community College and Guilford Technical Community College
New work includes:
Capstone Experience for Pharmaceutical
GLP and GMP Course Offerings
Distance Learning Formats
Profile of Key Pharmaceutical Positions

Appendix Four

New or Enhanced Courses and Modules Funded by BioNetwork

Auditing for cGMP
Basic Cell Culture Techniques
Basic Microbiology Techniques
BIO 250- Genetics
BIO 275 - Introduction to Microbiology
BIO 280- Biotechnology
BioFlow 3000 Fermentor Protocol
Bioprocessing in the Workplace I
Bioprocessing in the Workplace II
Biotechnology Career Exploration
Biotechnology in Local School (BILS) "Road Show"
BioWork Unit 10 entitled "Marketing the Smart Worker"
BTC 150 - Bioethics
BTC 181 Basic Laboratory Techniques-Hybrid
BTC 281 Bioprocess Techniques-Hybrid
BTC 285 - Cell Culture
BTC 286 - Immunological Techniques
BTC 286 Immunological Techniques-Traditional
BTC 288 Biotechnology Laboratory Experience-Traditional
cGMP Quality Systems
Conducting Investigations
Data Analysis
Documentation and Record Keeping
Enhancement of BTC 281
Explorations in Biotechnology
Fermentation Technology
GMP for Laboratory Operations
GMP Leadership
GMP Orientation
GMP Workshop
Good Laboratory Practice
Industrial Microbiology and Contamination Control (BTC-275)
Instructional Video re: process and significance of DNA extraction in biotechnology
Introduction to Biotechnology
Introductory Bioinformatics
Kit-based Experiments in Biotechnology and Ecology
Management Review for Quality Systems
MNT 270 Bioprocess Equipment Maintenance
MNT 280 Bioprocess Operating Systems
Module of Instruction for BPM 110 or PTC 110
Online Marine Biology Course (Bio 243)
PCR Workshop
Problem Solving and Math Skills
QA Fundamentals
Records as a Tool for Animal Welfare
Validation Fundamentals
Web format for nine BioWork Units and relevant materials for distance format of course

Appendix Five

NC Community Colleges with BioNetwork and/or Biotechnology Connections through FY 2005-2006

School	County Service Area	BioNetwork Center	Innovation Grant(s)	Equipment Grant(s)	Bio Work	BioTech Program	1 + 1 Program	Feeder to
Alamance CC	Alamance		1	3		Biotechnology		
Asheville-Buncombe TCC	Buncombe, Madison	BioBusiness		5	Yes	Biotechnology		
Beaufort County CC	Beaufort, Hyde, Tyrrell, Washington						Biotechnology	Pitt CC
Bladen CC	Bladen						Biotechnology	Fayetteville Tech
Blue Ridge CC	Henderson, Transylvania						Biotechnology	A-B Tech CC
Brunswick CC	Brunswick		1	1	Yes			
Caldwell CC/TI	Watauga, Caldwell					Biomedical Equipment Technology	Biotechnology	A-B Tech CC
Cape Fear CC	New Hanover, Pender		1	1		Chemical Technology		
Carteret CC	Carteret		1	1			Biotechnology	Pitt CC
Catawba Valley CC	Alexander, Catawba						Biotechnology/ Biotechnology	A-B Tech CC/ Forsyth Tech CC
Central Carolina CC	Chatham, Harnett, Lee	Capstone Consortium	2	4	Yes	Bioprocess Technology		
Central Piedmont CC	Mecklenburg							
Cleveland CC	Cleveland			2		Biotechnology		
Coastal Carolina CC	Onslow							
College of The Albemarle	Camden, Chowan, Currituck, Dare, Gates, Perquimans, Pasquotank			1			Biotechnology	Pitt CC
Craven CC	Craven						Biotechnology	Pitt CC
Davidson County CC	Davidson, Davie		1				Biotechnology	Forsyth Tech CC
Durham TCC	Durham, Orange	Capstone Consortium		1	Yes	Clinical Trials Research	Biotechnology	Alamance CC
Edgecombe CC	Edgecombe			1			Biotechnology	Pitt CC
Fayetteville TCC	Cumberland		1	2		Biotechnology		
Forsyth TCC	Forsyth, Stokes	Pharmaceutical Consortium	1	2		Biotechnology/ Nanotechnology		

School	County Service Area	BioNetwork Center	Innovation Grant(s)	Equipment Grant(s)	Bio Work	BioTech Program	1 + 1 Program	Feeder to
Gaston College	Gaston, Lincoln	BioEducation	2	2		Biotechnology	Biomedical Equipment Technology	Caldwell CC
Guilford TCC	Guilford	Pharmaceutical Consortium	1		Yes	Chemical Process Technology	Biotechnology	Alamance CC
Halifax CC	Halifax, Warren, Northampton							
Haywood CC	Haywood		2	2			Biotechnology	A-B Tech CC
Isothermal CC	Polk, Rutherford						Biotechnology	A-B Tech CC
James Sprunt CC	Duplin			2			Biotechnology/ Biotechnology	Fayetteville Tech CC/Pitt CC
Johnston CC	Johnston	Capstone Consortium	1	4	Yes	Bioprocess Technology	Industrial Pharmaceutical Technology	Wake Tech CC
Lenoir CC	Greene, Lenoir, Jones		1	1	Yes	Agriculture Biotechnology	Biotechnology	Pitt CC
Martin CC	Martin, Bertie						Biotechnology	Pitt CC
Mayland CC	Mitchell, Avery, Yancey		1				Biotechnology	A-B Tech CC
McDowell TCC	McDowell			1				
Mitchell CC	Iredell						Biotechnology	Forsyth Tech CC
Montgomery CC	Montgomery							
Nash CC	Nash		1	2			Biotechnology/ Industrial Pharmaceutical Technology	Pitt CC/Wake Tech CC
Pamlico CC	Pamlico						Biotechnology	Pitt CC
Piedmont CC	Person, Caswell	Capstone Consortium	1	4	Yes	Laboratory Technology	Biotechnology	Alamance CC
Pitt CC	Pitt	Bioprocessing	1	6	Yes	Biotechnology		
Randolph CC	Randolph			1			Biotechnology	Alamance CC
Richmond CC	Richmond, Scotland		1					
Roanoke-Chowan CC	Hertford, Bertie, Northampton						Biotechnology	Pitt CC
Robeson CC	Robeson	BioAgriculture	1	2	Yes		Biotechnology	Fayetteville Tech CC
Rockingham CC	Rockingham						Biotechnology	Forsyth Tech CC
Rowan-Cabarrus CC	Cabarrus, Rowan		1	1	Yes			

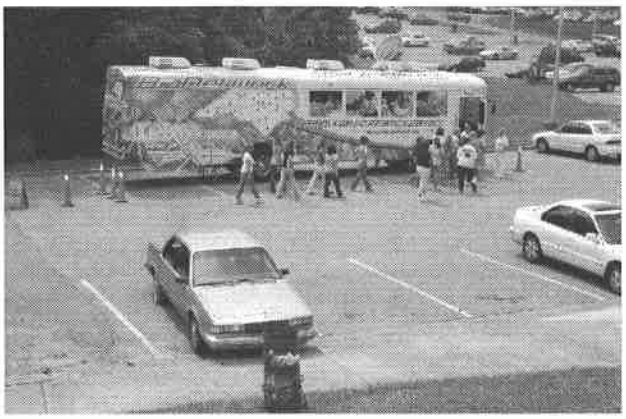
School	County Service Area	BioNetwork Center	Innovation Grant(s)	Equipment Grant(s)	Bio Work	BioTech Program	1 + 1 Program	Feeder to
Sampson CC	Sampson		1	2			Biotechnology	Fayetteville Tech CC
Sandhills CC	Hoke, Moore	Capstone Consortium						
South Piedmont CC	Anson, Union							
Southeastern CC	Columbus		3	2		Agriculture Biotechnology	Biotechnology	Fayetteville Tech CC
Southwestern CC	Jackson, Macon, Swain						Biotechnology	A-B Tech CC
Stanly CC	Stanly					Biomedical Equipment Technology		
Surry CC	Surry, Yadkin			1			Biotechnology	Forsyth Tech CC
Tri-County CC	Cherokee, Clay, Graham							
Vance-Granville CC	Vance, Franklin, Granville, Warren	Capstone Consortium	1	2	Yes	Bioprocess Technology		
Wake Tech CC	Wake	Capstone Lead	2	2	Yes	Industrial Pharmaceutical Technology		
Wayne CC	Wayne			1			Biotechnology	Pitt CC
Western Piedmont CC	Burke						Biotechnology	A-B Tech CC
Wilkes CC	Alleghany, Ashe, Wilkes			1			Biomedical Equipment Tech/Biotechnology/Biotechnology	Caldwell CC/A-B Tech CC/Forsyth Tech CC
Wilson TCC	Wilson			1	Yes		Biotechnology/ Industrial Pharmaceutical Technology	Pitt CC/Wake Tech CC

Appendix Six

NCCCS BioNetwork Mobile Laboratory

At Targacept

At Catawba Valley Community College



NC BioNetwork Mobile Laboratory Visits Since May 18, 2006

Novozymes - Franklinton
Glaxo-Smith-Kline - Zebulon
Diosynth - RTP
Targacept – Winston-Salem
Dedication of North Carolina Research Campus – Kannapolis
Dedication of Facility at Bionetwork Processing Center - Greenville
Gaston Community College – Dallas (2)
Cleveland Community College – Shelby
Catawba Valley Community College – Hickory
Forsyth Tech – Winston-Salem
NC Legislature – Raleigh
Atkins School – Winston-Salem
NC Association of Community College Trustees – RTP
Numerous Advisory Committees for BioNetwork Colleges
Wyeth – Sanford – Microbial Identification (2)
Talecris – Clayton - Microbial Identification

Appendix Seven

NORTH CAROLINA COMMUNITY COLLEGE SYSTEM OFFICE BIONETWORK FISCAL YEAR 2005 - 2006		
ACCOUNT	DESCRIPTION	EXPENDITURES AS OF 6/30/06
531211	SPA-REG SALARIES-APPRO	233,823.01
531321	CONTR EMP PER IRS-APPRO	5,580.00
531421	HOLIDAY PAY - APPRO	150.96
531461	EPA&SPA-LONGVTY PAY-APPR	3,997.00
531511	SOCIAL SEC CONTRIB-APPRO	17,424.36
531521	REG RETIRE CONTRIB-APPRO	16,229.64
531561	MED INS CONTRIB-APPRO	15,097.74
531575	EMPLOYEE ASSISTANCE PROG	29.40
531XXX	**PERSONAL SERVICES**	**292,332.11**
532170	ADMIN SERVICES	9,068.88
532199	MISC CONTRACTUAL SERVICE	169,843.75
532430	MAINT AGREEMENT EQUIP	895.00
532799	TRAVEL	11,671.36
532811	TELEPHONE SERVICE	986.08
532817	INTERNET SERV PROV CHARGE	17.12
532840	POSTAGE, FREIGHT & DELIV	148.87
532840003	POST,FR&DEL-POSTAL METER	500.21
532850	PRINT,BIND,DUPLICATE	381.10
532860	ADVERTISING	626,619.38
532930	REGISTRATION FEES	10,405.00
532XXX	**PURCHASED SERVICES**	**830,536.75**
533110	GENERAL OFFICE SUPPLIES	3,793.22
533720	EDUCATIONAL SUPPLIES	1,548.92
533XXX	**SUPPLIES**	**5,342.14**
534511	FURN-OFFICE	1,841.74
534532	VIDEO TRANSMISSION EQUIP	2,809.21
534534	PC/PRINTER EQUIPMENT	351.50
534713	PC SOFTWARE	-
534XXX	**PROPERTY, PLANT & EQUIP**	**5,002.45**
535830	MEMBERSHIP DUES&SUBSCRIP	50.00
535XXX	**OTHER EXPENSES & ADJUST**	**50.00**
536902	CONTRACTS AND GRTS	3,480,434.83
536XXX	**AID & PUBLIC ASSISTANCE**	**3,480,434.83**
538010	FLEX SPEND ACCT SAV TRAN	699.78
538990*	TFR-CARRYFORWARD	2,115,382.00
538XXX	**INTRAGOVERNMENTAL TRANS**	**2,116,081.78**
	TOTAL EXPENDITURES	**6,729,780.06**
*OSBM approved the carryforward of unused grant funds ($2,115,3852.00) due to the delay of grant awards pending completion of Golden LEAF funding.		

NORTH CAROLINA COMMUNITY COLLEGE SYSTEM OFFICE		
BIONETWORK ADVERTISING		
FISCAL YEAR 2005-2006		
		EXPENDITURES AS
ACCOUNT	DESCRIPTION	OF 6/30/06
532199	MISC CONTRACTUAL SERVICE	725.00
532449	MAINT AGREE-SERVER SOFTWARE	7,200.00
532821	COMPUTER/DATA PROCESS SV	100.00
532850	PRINT,BIND,DUPLICATE	5,692.42
532860	ADVERTISING	610,266.19
532XXX	**PURCHASED SERVICES**	**623,983.61**
533900	OTHER MATERIALS & SUPPLIES	800.87
533XXX	**SUPPLIES**	**800.87**
534532	VIDEO TRANSMISSION EQUIP	1,790.00
534713	PC SOFTWARE	44.90
534XXX	**PROPERTY, PLANT & EQUIP**	**1,834.90**
	TOTAL EXPENDITURES	**626,619.38**

Appendix Eight

BioNetwork Success Stories

David Hall, *Now employed at Biolex in Sanford*

I worked at Avondale Mills in Sanford NC for 14 and a half years. There are two plants in Sanford; the one I worked at was called the Lee Plant. I worked my way up doing various jobs such as a machine operator, technician, and overhauler. The plant closed down about November of 2001. I was thirty-seven years old when I decided to enroll at Central Carolina Community College for a Bioprocess Technology Associate Degree. My decision was based on many different factors. I have always been interested in science. I also want to have a career in a business that was moving forward and had great possibilities for advancement. I am a single father, and have a seventeen year old daughter, and I wanted a job that would give me the possibility to one day be able to pay for her college education. The classes at college were very interesting and also challenging. The college has a good support system to help students get through their classes. We also formed study groups to help us pass classes with better grades. All in all my experience at college was a good one; I would recommend this school to anyone who wants to better themselves. I graduated in May of 2004, and started interviewing for jobs with many different pharmaceutical companies in the Triangle area. Biolex was the first to offer me a full-time job. Working for Biolex has been very interesting and I am hoping that because it is a relatively new company, I will have more opportunities for advancement as I learn the different processes involved.

Tom Mastick – in an email to the BioNetwork Capstone Center

"..the good news - I got a new job in the Pharmaceutical Industry! The cGMP and BioProcessing Operations classes were instrumental in getting my new job!....." ***(hired by Hospira, Inc.)***

Ann Farnham – in an email to the BioNetwork Capstone Center

"…I am so excited and very grateful to all of you for the excellent education I received to get here…" ***(a new Manufacturing Associate at Biogen Idec)***

Alicia Brooks, *Now employed at Quality Chemical Laboratories in Wilmington*

I had had an array of different jobs, ranging from an assembly and fork-lift operator in the automotive industry, to a waitress and assistant manager in the restaurant business and finally to a pharmacy technician in a non-retail pharmaceutical setting. I always knew I had wanted to attend college; however the stresses of working 50+ hours in my previous employment and the obstacle of affordable daycare held me back for many years. When I made the move to Wilmington with my family of four, including two small children… I had to start over. I started off working as a waitress in 2000. By the middle of the year, I obtained employment once again as a pharmacy technician. I decided to apply for and attend college at Cape Fear Community College. Because I had some experience in the pharmaceutical industry and was very interested in the science involved, I chose the Chemical Technology program at CFCC. Although it was difficult working two part-time jobs, attending college full time and raising two small children, I was encouraged and supported through family, friends and my instructors. I've learned determination is the key to any success and nothing is beyond reach if you want it bad enough. I feel the instructors and the curriculum of the Chemical Technology program prepared me very well for work in industry. I graduated on a Friday afternoon from CFCC in 2003 and started the following Monday at Quality Chemical Laboratories as an analytical chemist. I am very thankful for the decision I made to attend CFCC. The opportunities I have been given in the industry and the future advancements I hope to obtain would not have been possible without my training there. The curriculum is very "hands on" and prepares the individual very well and realistically for the work environments the industry encompasses. I strongly encourage anyone looking for more than just a day-to-day job to seriously inquire about the programs offered in the Chemical and Biotech industries.

Lisa Lewis, *Now employed at Phenix Research Products.*

Prior to working at Phenix Research Products, I was employed in the stainless steel and stainless steel specialty products industry for over 20 years. I was very fortunate to have avoided the many lay-off cycles that the industry underwent. In the Fall of 2003, I learned that the demand for our products was moving off-shore. I knew that I needed to take my experience and apply it in another industry. Several months earlier, I had read an article in the Asheville-Citizen Times highlighting the biotechnology field and addressing a new business located at the AB-Tech Campus, called Magna DNA. I was very excited about the industry and often wondered how I could become involved in biotech. I learned that a portion of the AB-Tech Enka campus had become an incubator for biotechnology and related businesses. Phenix Research Products was located in the incubator and was in need of an individual with Sales Administration experience. At Phenix's suggestion I took the first BioWork short course offered at the campus to familiarize myself with the industry that we supplied and worked so closely with. I passed the class in the top 5% and successfully sat for the State Exam to become certified as a Bioprocess Technician. With the aid of my training, and continuous client contact, I have learned a great deal about providing the latest in state-of-the-art instrumentation and consumable products used in University Research Laboratories, Forensics, Pharmaceuticals, and biomanufacturing facilities. I didn't need a college degree to jump-start my career in biotechnology, I just needed the desire.

Appendix Nine

Article Excerpt from the Press in Georgia
State Grooms Biotech Credentials **The Atlanta Journal – Constitution** **September 2, 2006**

As Georgia works to land a premier federal lab that will bring prestige and jobs, it faces competition from several states, including neighbor North Carolina

David Lee has been the head of research at the University of Georgia for only a year, yet he's already taken up a crusade that could remake the state's economy and establish Athens as a citadel against some of the worst diseases you can think of. The shy, transplanted Californian is marshaling Georgia's bid for what's called the National Bio and Agro-Defense Facility, what will be America's leading lab to make vaccines against nightmares like bird flu, SARS and anthrax --- whether they're caused by nature or evildoers. The federal lab could be a huge prize for Georgia, not just in terms of jobs and dollar investment, but the prestige the facility could bring. Almost overnight, the National Bio and Agro-Defense Facility could make Georgia a comer in the lucrative biotechnology industry. One official called it "the most significant opportunity to come our way in the last decade." But the effort faces a major frustration. Despite the state's general economic success, Georgia remains to some extent a biotechnology backwater.

On the surface, Georgia's biotech credentials look good. The state is home to the Centers for Disease Control and Prevention, enjoys a top-flight university system and has CEO-led groups like the Georgia Research Alliance helping to woo big biotech employers like drug companies and vaccine makers. An Ernst & Young study earlier this year ranked Georgia seventh among U.S. states for the number of biotech companies. In 1995, the state wasn't even on the list. But behind those numbers, Georgia is not recognized as a national hub for the industry, said Michael Cassidy, president of the Georgia Research Alliance. "As we talk with major companies [in biotechnology] ... we're a newcomer." Many of Georgia's biotech companies are small, fledgling firms, rather than large, famous biotechnology employers, Cassidy said. In fact, the larger employers have jilted the Peach State.

Merck & Co. and, just this summer, Novartis, dropped the idea of building major factories in Georgia. Both complained that there weren't enough local workers with the skills to man their plants. The companies instead chose to build in North Carolina. Those losses hurt, because Georgia lacks big private investment from biotech firms. "We have to recruit larger companies to get more credibility," Cassidy said. "We've had difficulty in doing that." What's even more frustrating is that North Carolina, a Southern neighbor and rival, has in particular shown up Georgia when it comes to the biotechnology industry.

North Carolina, which has been branding itself as a biotech center for the past decade, last year had created about 37,700 jobs in life, physical and social sciences, according to the Bureau of Labor Statistics. Georgia's economy had generated a more modest 22,500. In just the 13-county area around Raleigh known as the Research Triangle region, more than 250 life science facilities employ some 24,000 people, according to the North Carolina Biotechnology Center, a state-funded organization that supports the industry there. Pharmaceutical giant GlaxoSmithKline alone employs about 5,800.

The Tar Heel educational system is besting Georgia's efforts, too. Each year North Carolina graduates some 800 people with two-year technical degrees to work in biotechnology manufacturing. Last year Georgia, despite its extensive network of technical colleges, produced just 35 such graduates.

Stakes are high

But officials like Lee and Cassidy believe there's too much money on the table for Georgia to give up biotech altogether. Georgia's leaders are hoping the state, with a few wins, can make a biotechnology name for itself. And one such win could be the National Bio and Agro-Defense Facility. Lee had barely unpacked this winter when the Department of Homeland Security announced its intention to build the defense facility. Seeing the potential, Lee and state officials jumped at the idea, and he wrote the bid Georgia submitted in March. The facility, when it opens in 2013, would be the nation's top lab developing cures against terrors like anthrax and bird flu that could menace national security.

Georgia faces worthy competition. A number of states with formidable economic and political muscle made the first cut earlier this summer, including North Carolina and California, one of the nation's leading centers for the biotech industry. The Department of Homeland Security has said it will trim the list by the end of the year and select a site by 2008. The stakes for Georgia are high. The facility "is the most significant opportunity to come our way in the last decade," said Cassidy at the Georgia Research Alliance. "It would put us on the map overnight." First, the lab would bring dollars. The $500 million facility could employ 500 scientists and generate as much as $6 billion in local economic impact over 20 years, according to a University of Georgia analysis. But, perhaps more importantly, it would bring renown.

Georgians have been trying for years to brand the industrial corridor along Ga. 316 from Atlanta to Athens as a center for the industry. A National Bio and Agro-Defense Facility in Athens could make that happen, Lee said.

Article Except from the Press in Massachusetts
Boston Business Journal **From the February 18, 2005 print edition**

If they build it, can we staff it? *Mass. falls behind North Carolina in preparing biotech industry workers*

With up to 60 Bay State biotechnology companies on the verge of expanding into drug manufacturing, there are equal parts hope and expectation that this potential economic windfall will generate thousands of new jobs in the coming years.

Biotech rival North Carolina is trying to outhustle the Bay State and generate hundreds more life sciences manufacturing workers annually to meet increasing demand. Their community college system has hired a centralized coordinator beefed up by more than $8 million in grant money to aggressively help member colleges grow biomanufacturing programs and train more entry-level manufacturing workers.

No such focused system exists yet in Massachusetts, raising the question of whether the Bay State is prepared to grow its biotech manufacturing base rapidly.

Initiatives such as tax cuts and streamlined permitting are intended to spur the job growth. But on the other side, the state's community colleges will be called on to play a crucial role in training graduates to fill the jobs.

Yet, only 100 or so graduates a year come out of the state's major community college biomanufacturing programs. ***(Note to readers – BioNetwork graduates more than 1,000 annually)***

Community colleges eagerly assert that they're willing to rise to the occasion. And state and industry officials point to existing programs that, they say, already help them do so. But some schools say they're struggling to meet demand even before a biomanufacturing boom has taken hold. While companies generally say they believe their needs are being met for now, others worry the absence of a unified state coordination and a lack of urgency in getting there risks hurting the ability of community colleges to meet future life sciences manufacturing needs. "We've only begun to talk about this over the last year or so. I don't think community colleges have had enough time to sit down and develop a comprehensive strategy," said state Sen. Jack Hart, chairman of the newly formed Joint Committee on Economic Development and Emerging Technology. Beyond that, Hart and others say students trained in science are on the decline in Massachusetts and elsewhere -- and that's sounding an alarm bell for those looking for enough biomanufacturing workers to train.

A series of figures show what's at stake: A recent Milken Institute report on biopharmaceutical industry contributions says direct biopharmaceutical employment here surpassed 21,400 in 2003, with the pharmaceutical manufacturing sector employing 8,500 of those people. But the Massachusetts Biotechnology Council's 2010 report issued in 2002 says 30,000 people are employed in life sciences or related positions here, with less than 10 percent devoted to manufacturing. The MBC report envisions that up to 100,000 new jobs could be generated if regulatory and economic conditions are favorable enough, and that about 60 life sciences companies, of more than 400 overall members, are on the verge of expanding into manufacturing. The state has made some recen biotech manufacturing gains, at Biogen Idec, Genzyme Corp. and others.

But we may already be losing the battle to states such as North Carolina. The North Carolina Biotechnology Center, a state funde nonprofit established to help grow the industry there, estimates the state holds about 40,000 life sciences jobs, with about 20,000 i biotechnology, pharmaceutical and medical device manufacturing. The organization expects life sciences companies there will need between 2,000 and 3,000 new employees per year to meet demand, said spokesman Barry Teater.

Other than the MBC's general projection of companies on the verge of manufacturing, state and industry officials here have not compiled specific projections for biomanufacturing employment. Initiatives in Massachusetts focus more on trying to coordinate information among state officials, industry and community colleges rather than spending money to build up an infrastructure. Las fall, Massachusetts joined a state and federal initiative known as Reach Hire, which involves a cooperative effort to identify emerging employment sectors, like biomanufacturing, then finding ways to place workers in community college programs to trai them. A $50,000 grant helped start it.

North Carolina's efforts include BioNetwork, an state initiative created with an $8.7 million grant from tobacco settlement money to grow biomanufacturing training throughout the North Carolina Community College system. Norman Smit, marketing and recruitment director for BioNetwork, said his program has already spent more than $6 million to help the system's 59 community colleges improve existing biomanufacturing training programs, buy equipment or develop curriculum for new programs. BioNetwork, he said, helps coordinate online course training among community colleges and find qualified faculty. "Our motto to provide a world-class biotechnology work force," he said.

Article Except from the Press in Pennsylvania

The Ridgeway Record ***Consultants Speak On Lumber Heritage*** Tuesday, July 18, 2006 12:20 PM EDT

Could a Center for Excellence help the mountains of western Pennsylvania dominate a vital manufacturing sector?

Private consultants Sarah Butzen and Wayne Fawbush are assessing the goals and strategies needed to realize prominence for the region in the value-added wood products sector. One of the recommendations they presented to community and industry leaders Monday in Bradford is a "Center for Excellence."

The center, as Butzen described it, could be similar to centers in North Carolina which she said are revitalizing the textile and biotechnology industries. Butzen said a center would promote regional cohesion, and collaborative and independent innovation. Using the "BioNetwork" in North Carolina as an example, Butzen said the center could be decentralized, spreading specialized facilities targeted to certain aspects of the value-added wood products market, as the BioNetwork does at numerous community colleges throughout North Carolina.

She and Fawbush said the first steps in implementing a center would be to identify potential sources of funding, to engage the public in discussion about the role the center could play in the region and to solicit bid proposals from interested firms to determine what services could soon be offered, were the project to be initiated.

Other recommendations the consultants shared included developing workforce training networks, working collaboratively with tourism groups to develop broad, multi-purpose branding and conferences or workshops for the private landowners and the officials who manage state and federal properties to bring more cohesion to land management policy.

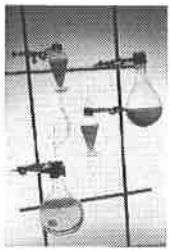
Fawbush and Butzen said the industry professionals they spoke with in conducting their studies were universal in agreement on the importance of workforce training. Fawbush noted Chinese firms, whose share of the market is 20 percent while the U.S. holds a 3 percent share, provides workers with twice the training U.S. workers receive.

Butzen and Fawbush said their efforts did not delve heavily into tourism, as other initiatives, particularly the Pennsylvania Wilds, have taken a leadership role. They said, however, the renewed focus on tourism is particularly key to wood artisans and said the region could promote packaging of value-added wood products with tours and trails which, according to their PowerPoint presentation, "showcase and promote the brand," to offer visitors a comprehensive experience.

"All of this is about regional collaboration," Butzen said.

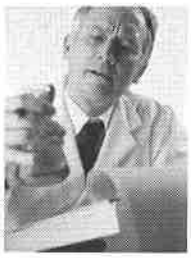
Fawbush, before offering recommendations with Butzen, spoke about the market in general, noting some high points and low points.

"There's a lot of buzz on biofuels," Fawbush said.



BioNetwork
PREPARING A WORLD-CLASS BIOTECH WORKFORCE

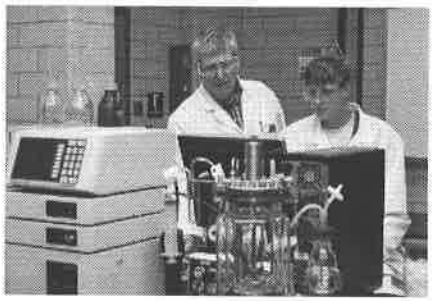
North Carolina
Community College System



BioNetwork Supports:

Solid Infrastructure
in Local Community Colleges

Equipped 30 New Or Retrofitted Labs
Funded >$12.2 Million in Innovation and Equipment
Established Interim Capstone Center Facility
Involved >200 College Science Faculty/Staff
Impacted the Learning of >8000 Incumbent Workers and Students (Future Workers)



Supplemental Funding

Local Colleges Leveraged BioNetwork Funding to Obtain More Than $17 Million Additional Funding For Biopharmaceutical-related facility renovations and other resources

Curricula Development

- 58 Courses Developed or Revamped
- 12 New Courses Developed for Online Distribution
- 16 of the New Courses Had Web Enhancements
- Student Support Including Videos and Lab Assistants
- Outreach Provided to K-12 Faculty and Students

Increased Enrollment

- Enrollment Increased in Specialized Worker Training
- Doubled Enrollment In Biotechnology-related Technician Training (13 Colleges)
- Tripled Enrollment In Biotechnology-related Curriculum
- New Community Colleges Approved for Biotechnology-related Programs (16 Colleges, 17 Programs)

Instruction

Faculty Enhancement Opportunities Keeping Pace with
ıdustry Technology
Statewide BioForum – April 2-5, 2007
The BioNetwork Validation Academy – Partnering with ISPE
ı Validation Training

Statewide Marketing & Recruitment

Increasing Enrollment to Meet Industry Needs and Offering Companies a Strategic Competitive Advantage

BioNetwork

Colleges Offering Curriculum Programs

Alamance Community College	Biotechnology
AB Technical Community College	Biotechnology
Caldwell Community College	BioMedical Equipment Technology
Cape Fear Community College	Chemical Technology
Central Carolina Community College	Bioprocess Technology
Cleveland Community College	Biotechnology
Durham Technical Community College	Clinical Trials
Fayetteville Technical Community College	Biotechnology
Forsyth Technical Community College	Biotechnology & Nanotechnology
Guilford Technical Community College	Chemical Process Technology
Johnston Community College	Bioprocess Technology
Piedmont Community College	Laboratory Technology
Pitt Community College	Biotechnology
Southeastern Community College	Agriculture Biotechnology
Vance Granville Community College	Bioprocess Technology
Wake Technical Community College	Industrial Pharmaceutical Technology

Colleges Offering Bioprocessing Technician Course (BioWork)

Asheville-Buncombe Technical Community College	Piedmont Community College
Central Carolina Community College	Pitt Community College
Durham Technical Community College	Robeson Community College
Gaston College	Vance-Granville Community College
Guilford Technical Community College	Wake Technical Community College
Johnston Community College	Wilson Technical Community College
Lenoir Community College	

Newly Developed Curricula Samples

- cGMP Courses
  - GMP Essentials for the New Employee, Documentation, Conducting Investigations, Management Review, Good Laboratory Practice
- Quality Assurance
  - QA Fundamentals, cGMP, Quality Systems
- Bioprocessing
  - Fermentation Technology, Cell Culture, Bioseparation, Purification of a Protein, Aseptic Operations
- Packaging Engineering, Viticulture, Forestry, Aquaculture
- Validation Academy Courses

Sample Capstone Center Offerings

- Elements of Aseptic Manufacturing
- Operations in Biotechnology Processes: An Overview
- Elements of cGMP Practices in Biomanufacturing
- Elements of Microbial Identification
- Gram-negative Bacterial Endotoxin Detection and Quantitation
- Pharmaceutical Water Quality

Sample BioBusiness Center Offerings

- Capital Formation
- Technology Commercialization
- Intellectual Property
- Technology Business Formation

Incumbent Worker Training Brought to Company Sites and to Rural Community College

Expanded Focus Areas

- Micropropagation
- Natural Products Herbal Growers
- Biofuels
- BioBusiness Hubs
- NC Research Campus
- AgriBiotechnology Curriculum – First in Country

www.ncbionetwork.org

For Further Information

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