

National Center for the
**Biotechnology
Workforce**

www.biotechworkforce.org



Forsyth Technical Community College, NC

NH Community Technical College, NH

Indian Hills Community College, IA

Bellevue Community College, WA

Miracosta Community College, CA

Combining strengths of five premier community colleges from around the nation for new learning models to build our biotech workforce



National Center Profile:
Forsyth Tech Community College
Biotech Research & Development Training Center of Expertise

www.forsythtech.edu

Contact Lucas D. Shallua Chair, Department of Biotechnology
lshallua@forsythtech.edu (336) 734-7575

The President's High Growth Job Training Initiative supports visionary life science sector development sparking action at regional levels. Companies, educators, researchers, entrepreneurs and governments all work together to achieve new levels of innovation. This Profile presents the Research & Development Center - ready to share ideas, resources and assistance at www.forsythtech.edu

Situated in Forsyth County's Winston-Salem - an emerging North Carolina research and biotechnology area called the Piedmont Triad - Forsyth Technical Community College prepares students to work in biotechnology companies in the Piedmont Triad and local research based institutions like the Wake Forest School of Medicine. Biotech is one of the Piedmont Triad technology growth areas that promise to reduce the impact of employment dislocations from declines in the region's traditional industries in furniture, textiles, and tobacco.

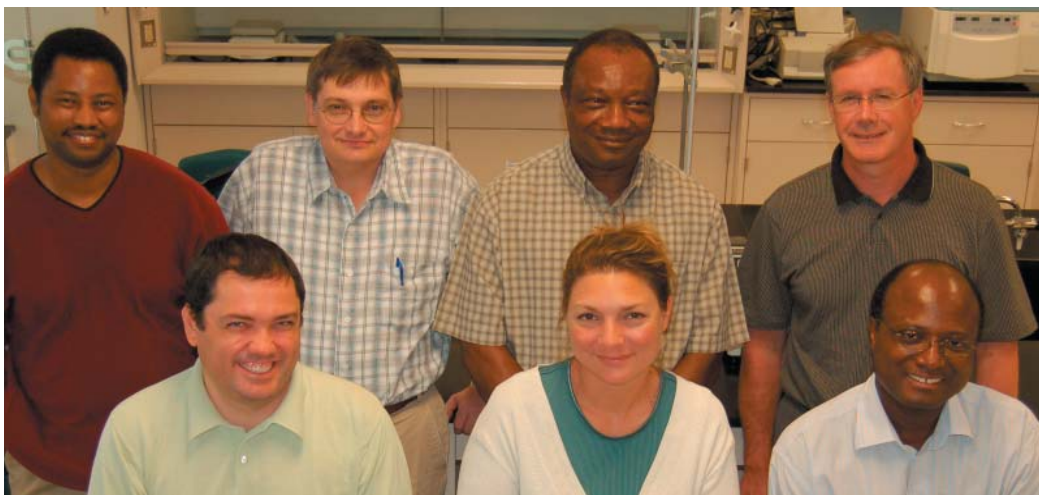
With a new building and facility, Forsyth Tech's biotechnology program prepares individuals to become the highly-skilled technicians the region needs to support medical, life science, and pharmaceutical research and development efforts vital to the economic, as well as physical, well-being of people here.

About three and half years in the making, Forsyth Tech is now the largest biotechnology training program in

North Carolina. Teaching is done in real world research and development (R&D) settings, so graduates are highly qualified with preparation that's very "hands on." Internship is required; graduates know exactly how to work in professional R&D settings.

Center Director Lucas D. Shallua has a doctorate degree in Veterinary Medicine, Sokoine University of Agriculture, specialized in Cell Biology and Endocrinology. As head of the Biotechnology Department at Forsyth Tech he leads in partnerships to develop the workforce. Numerous partnerships are in place with local, regional and national biotech industries, academic institutions and pharmaceutical companies. Dr. Shallua's

work was twice awarded Recognition of Excellence by the US Department of Labor. Similarly, the Piedmont Triad NC Biotechnology Advisory Board recognized the work of both he and Dr. Gary Green, Forsyth Tech president, for academic excellence in biotechnology education in 2005.



Biotech Research and Development Center of Expertise staff
top row, from left: Lucas Shallua, Alan Beard, Aju Lekwauwa, Russ Read;
bottom row, from left: Stephen Johnson, Toni Beery, Lucien Houenou

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To harness the power of biotechnology industry potential – with a skilled, ready workforce – the U.S. Department of Labor Education and Training Administration created the National Center for the Biotechnology Workforce in 2004. Because community colleges are actively involved in meeting the needs of workers and industries in their communities, the National Center focuses energy and investments on five community colleges with different but congruent strengths in the biotechnology industry to create new curricula and infrastructure models that can easily be shared and replicated.



Starting the Center: Turning from Textiles to Technology

While biotechnology quietly grew in the background, the turn of the century brought disruptions and employment dislocations in Forsyth Tech's region of North Carolina. More people became unemployed, from 2.9 percent in 2000 to 5.8 percent in 2002, largely due to downsizing and relocation of manufacturing operations overseas.

Major furniture manufacturers experienced downturns. The impact on the textile sector was similarly bleak. In 2001, Guilford Mills of Greensboro had its worst year in the company's history. In March of 2002, the company filed for bankruptcy protection. The effects of this textile downturn were also felt in related industries. Tobacco suffered a double impact of economic downturn coupled with lawsuits.

Meanwhile, dozens of biotech companies were beginning to appear. RJ Reynolds spun off Targacept, Inc. - a clinical-stage biopharmaceutical company that is developing a novel class of drugs to treat diseases and disorders of the central nervous system, including Alzheimer's disease. An overview of biotechnology in the Piedmont Triad can be found at www.triadbitech.com.

When Forsyth Tech conducted surveys of these nearby biotechnology enterprises the good news was that many would hire a large number of laboratory workers each in future years at good salaries. Targacept is one of the growing companies located in the Piedmont Triad Research Park - a highly interac-



Piedmont Triad Research Park

tive, master-planned innovation community being developed to support life science and information technology research and development in downtown Winston-Salem. The Wake Forest Institute for Regenerative Medicine is another tenant that works closely with the Piedmont Triad Research Park, serving

as an incubator for new biotech businesses generated from technologies discovered in its laboratories. A leader in laboratory-grown organs, the Institute made news when it announced success in implanting engineered bladders in human recipients. The Institute has articulation agreements with Forsyth Tech and offers internships.

Forsyth Tech at large is ideally suited to address the need to train dislocated manufacturing workers - many of whom have limited formal education and need remediation and English language training. A portion of its faculty is devoted to teaching remedial classes including GED preparation, ESL instruction, computer training, and counseling. The college also has experience serving the Hispanic population. Moreover, Forsyth Tech is part of a WIA One-Stop collaboration with a host of human services and community based partners who provide core, intensive, and training services.

Forsyth Tech's demand-driven response to declines in one industrial sector through the re-skilling of that population for a new and emerging industry will serve as a replicable model for other biotechnology programs and other industrial sectors.

A new 'hands-on' tech building expands training capacity



A powerful resource for developing a biotechnology workforce in the Triad region officially opened in early March 2006 - a new technology building including 17,000 square feet of new lab space beautifully equipped with state of the art equipment made possible by U.S. DOL and North Carolina Community College System BioNetwork grants. The training facility has four wet labs, an immunology room, a bioprocessing room, microbiology and cell biology rooms.

Creating Curriculum

In response to industry requirements, Forsyth Tech developed a two-year associate in applied science degree curriculum in biotechnology that includes hands on courses in Basic Laboratory Techniques, Bioprocess Techniques, Cell Culture, Immunological Techniques and Genetics. Biotechnology Laboratory Experience is also obtained through required internships. Current skills acquisition includes molecular biology, tissue culture, immunology, animal handling, chromatography, instrumentation, and laboratory mathematics.

Two Forsyth Tech graduates recently went to work with Tengion, a novel biotech company in Winston-Salem. These students finished their orientation program in record time. Employers are delighted with the skill sets Forsyth Tech delivers.

The tracking of student internships and job placement is in full force with a study on workforce outcomes by Forsyth Tech's BT Workforce Research Manager Dr. Stephen Johnson with a regional grant from the North Carolina Biotechnology Center. Graduates find employment in various areas of industry and government, including research and development, manufacturing, sales, and customer ser-



Meet Russ Read

Forsyth Tech is the lead institution for the National Center for the Biotechnology Workforce (NCBW) and Russ Read is executive director. He was the CEO of Kucera Pharmaceutical Company, an early phase, emerging biotech company locally based. He worked for more than two decades with large pharma research and development. "Most companies in biotechnology research parks are local spin-offs, and they need exactly the type of trained



workforce that our colleges within this program are training. It's really a business model although we are in an academic setting," says Read.

He sees the National Center as a catalyst to bring any community college or academic partner wanting to start biotechnology training the models or curricula needed. "We are a cooperative and co-mingling group with one desire: to build a strong U.S. biotechnology work force."

Contact: rread@forsythtech.edu,
(336) 734-7651

vice and some proceed to four year college.

Biotechnology program instructors at Forsyth Tech are very qualified, most have Ph.D.'s, with extensive experience in microbiology, molecular genetics, cell/tissue culture, biochemistry, analytical chemistry, organic chemistry, applied chemical processes, and laboratory techniques.

Forsyth Tech has numerous articulation agreements in place, including those with nine local community colleges that enable students within commuting distance, to take their second year of biotechnology training. A similar agreement is in place with four year colleges including the University of North Carolina at Greensboro, North Carolina Central University and Winston-Salem State University. This agreement allows students to transfer into 4 year programs and receive credit for their experience at Forsyth Tech. The college is also linked with the Winston-Salem/Forsyth County school system, allowing students to take biotechnology courses at Forsyth Tech.



Displaced Workers Find Success Through Biotech Training

During one of the sessions at this year's DDOL-ETA Workforce Innovations conference in Anaheim, Jim Crawford, 56, from Forsyth Tech, told a compelling story of how he chose biotech education and his internship at the Wake Forest Institute of Regenerative Medicine. Ultimately, he was hired there as a result of this successful internship.

He is not the only displaced worker who found a new career through Forsyth Tech biotechnology. Regina Whitaker is another example who represents hope for the state's economy.

Today, Whitaker, 26, one of Forsyth Tech's first biotech graduates in July 2004, works as a laboratory technician for Targacept. Four years ago things weren't looking that great at her job with Unifi, a shrinking textile manufacturer. Her aunt's job was cut in a layoff. "Going back to school wasn't hard to do when you considered the alternatives," Whitaker said. "I spotted the biotech curriculum, thought that was pretty cool, and everything just

clicked for me in the classroom and the lab."

Pursuing an associate degree wasn't easy - she worked from 20 to 30 hours a week as a waitress and an additional ten hours a week in a work-study program. Her break came when Targacept selected her as one of two interns, which led to her being hired full time in November 2004.



Forsyth Tech student Jim Crawford (left) works in the lab with Toni Beery and Lucas Shallua



PARTNERS

Establishment of new partnerships in workforce training with local biotech companies and academic institutions is taking place. The Wake Forest Institute of Regenerative Medicine and MWG Biotech (a genomics company) recruited three students each with internship arrangements that provide “hands on experience” training.

A similar success story is the “Biotechnology Workforce Training Trends” conference held May 22 and 23 in Winston- Salem. Forsyth Tech and the National Center for the Biotech Workforce office worked in cooperation with the North Carolina Community College System’s BioNetwork, and in conjunction with Alamance Community College that is the Southeast Bio –Link Regional Center.

The NC Council for Entrepreneurial Development, Targacept, the NC Biotech Regional Office and the Winston-Salem Chamber of Commerce all helped organize this event. About 75 people attended the panel and presentations, followed by a reception. A second session followed on day two, entitled “Raising Human Capital,” organized by the same partners and orchestrated from the National Center office, panelists included CEOs and senior representatives from Wyeth Biotech (vaccines), Biolex (plant farmed GM proteins for therapeutic use), and GSK (pharmaceuticals).

This session included US DOL-ETA representative Erika Baum, chief of staff for Assistant Secretary Emily Stover de Rocco. The session was moderated by Dr. Gary Green, president of Forsyth Tech, and was very well attended with about 120 people. This was an open and honest session about job training for the future in United States biotechnology. The two sessions were captured in an exciting issue of the Biotech Resource Line. It can be found, with a slide show, at www.biotechworkforce.org.

NCBW Recognized With Excellence Award

At this year’s DOL-ETA Workforce Innovations conference in Anaheim the National Center for the Biotechnology Workforce was presented with Recognition of Excellence honors. Celebrating are (from left) Janet Paulson - Indian Hills CC, Patricia Dombrowski - Bellevue CC, Chuck Crabbtree - Indian Hills CC, Rebecca Keith - Forsyth Technical CC, Sonia Wallman - NHCTC, Russ Read - NCBW, Emily Stover De Rocco - Assist. Sec. of Labor, Ric Matthews - Miracosta College, Ron Shelton - Forsyth Technical CC.

Moving Forward

Building on a solid foundation, the award winning Forsyth Tech intends to strengthen existing collaborations and partnerships and establish new ones, including a “train the trainers” program for nine local community college instructors.

Another plan is to build summer programs for high school biology and chemistry instructors to build an internship at the college.

Increasing collaborative opportunities and innovations with local biomedical research centers and companies will enable them to replicate their research activities at the college to enhance the Forsyth Tech learning experience. Faculty also benefit with experiences at the research company enhancing their skills.

Thanks to Sponsors, Partners, Supporters, Participants:

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The National Center for the Biotechnology Workforce preparing workers for in-demand jobs in high growth, advanced technologies maintaining U.S. competitiveness in our growing global economy.