



BIOTECH RESOURCE LINE

A NEWSLETTER TRACKING TRENDS IN BIOTECHNOLOGY

Best Practices in Biotechnology Workforce Training

A report from the panel discussion

"Biotech Workforce Education and Training Panel—Best Practices"

Winston-Salem, North Carolina

Piedmont Triad Research Park - Finding the ideal candidates for biotech programs, and ensuring they receive the right foundation of training, was the subject of much discussion among a group of biotechnology educators who gathered in Winston-Salem on January 10, 2007. "Best Practices in Biotechnology Workforce Training," a panel discussion sponsored by the National Center for the Biotechnology Workforce at Forsyth Technical Community College, featured 10 speakers sharing perspectives on how to best marshal a wave of biotech workers needed to meet the demands of research and industry in the 21st century.

The ideal biotechnology worker has not only the hard technical skills but also strong "soft skills" such as good communication, enthusiasm for learning, and an ability to collaborate well with others in a work setting—skills that transfer easily across the broad spectrum of biotech jobs. Most biotech employers expect to invest some months of training in new employees, relying upon the community and technical colleges to develop in them a strong foundation of knowledge and skills. Many of the best and most loyal biotech workers are retrained older students who were downsized from other career fields. Others are young high school graduates—some of whom began their biotech coursework while still in high school—who prefer a two-year program and quick pipeline to employment over a four-year degree.

Retaining good biotechnology workers, particularly after investing much time and capital in training them, is crucial to biotech companies' success. The most diligent and loyal workers often are community college graduates who chose that educational route because they were already rooted to the geographic area. Moreover, their employment often resulted from internships or apprenticeships they held at the company while still in their two-year programs.

Retention Rates High Among Community/Technical College Graduates

Community college biotech graduates are solving a large and ongoing problem in the labor force of the San Diego area, stated Ric Matthews, Dean of Math and Sciences, MiraCosta Community College, Oceanside, California. When Genentech, a local biotechnology company, conducted an employee satisfaction survey, it found that workers who had graduated from two-year programs reported the highest level of job satisfaction, he told the audience.

In a region that is home to more than 500 biotech companies, such results delight employers, Matthews noted. "Finding skilled workers has been a challenge, because the labor pool isn't getting any bigger. Employees were just moving around between the companies for more money. That's not really a solution, because there is no loyalty there. We thought, why not train the local folks who have already made a commitment to the area?"

The cost of the highly specialized faculty and facilities required for a biotech program can be daunting for a community college, however. Although Genentech informed MiraCosta that it could not fund a facility, they did provide the community college with a new means of getting a

strong biotech program off the ground: Genentech provided the expertise of its employees to help plan the facility, along with 80% of a full-time faculty member's salary for the first year, while MiraCosta provided the other 20%. During the four years that followed, Genentech's commitment for the faculty salary decreased while MiraCosta's increased. The college now pays the full salary.

Of course, graduates of community colleges can always choose to pursue a four-year degree later, and often their studies are supported financially by the employer. Yet the opposite is true as well. In fact, Forsyth Technical Community College has found that students at nearby four-year colleges are interested in Forsyth Tech's biotech training, said Alan Beard, the program's lead instructor. To that end, the college has arranged "articulation agreements in both directions." The Forsyth Tech program ensures that its students are well versed in research competencies, as well as skills that transfer well among employers, such as lab safety and standard operating procedures.

Another Forsyth Tech requirement is that biotech students pursue a 160-hour internship. Thanks to her internship at Targacept, a biopharmaceutical company in Winston-Salem, recent graduate Regina Whitaker is now a full-time lab technician there. "The internship experience was invaluable," Whitaker told the group. "I was able to learn about my field while developing social skills and meeting people from many culturally diverse backgrounds. I am so fortunate to be one of those people who loves her job." Whitaker informed the audience that she plans to earn a bachelor's degree at nearby Salem College while continuing to work at Targacept.

Tim Bertram, Vice President of Science and Technology, Tengion, Inc., Winston-Salem, North Carolina, concurred that the Forsyth Tech program has been a key ingredient in the success of his regenerative medicine company. Tengion has succeeded in using patients' own cells to regenerate 20 different kinds of tissues and organs. Since its founding only two and a half years ago, the company has grown from zero to 70 employees, and many of the technology employees at Tengion Laboratories are graduates of the Forsyth Tech program.

"Tengion would be nothing but a start-up company without human capital," Bertram stated.

"The Forsyth Tech graduates we have hired are mature, with deep roots in the local community. We build on the foundation that Forsyth Tech lays. New employees spend an intensive six months in training at Tengion. They must be motivated, conscientious and diligent, real solution finders and solution implementers... I do not have the luxury of making a six-month investment in an employee just to have them walk out the door."

Outreach Efforts Must Begin Early

Outreach efforts for potential workers must begin as early as the fifth grade, emphasized Danette Toone, Executive Director, Texas Biosciences Institute, and Vice President, Advancement, Business, and Community Education, Temple College, Temple, Texas. "We found that one weakness in finding future workers is that, if they are not started on the right academic path as early as the fifth grade, we are losing them." In order for most students to set out on a timely path to enter a biotech training program during or immediately after high school, they must complete Algebra I in the eighth grade, she informed listeners.

In addition to older workers who have been downsized—some even from the medical profession as hospitals have consolidated in the region—Temple has found appropriate candidates among high school and middle college students who enroll in dual education programs that result in a high school diploma and an associate of arts degree upon graduation. Home-schooled students love the fast track as well, Toone added. Students who successfully complete the program receive a special cord to wear with their gowns on their high school graduation day.

Other popular programs at Temple include an associate's degree in applied science (AAS), advanced technician certificate (ATC) and enhanced skills certificate (ESC), particularly popular among area companies wanting to offer specially tailored, high-end training to their employees, she observed.

Outreach to the community is also a major strategy for the Center of Expertise in Agricultural Bioprocessing at Indian Hills Community College, Ottumwa, Iowa, explained project coordinator Janet Paulson. The overwhelming need for workers driven

by nearby corn- and ethanol-related industries like Cargill, Inc., Ajinomoto Foods and Wacker Chemical Corp. means that educating parents, teachers and the public in general is crucial to developing the future workforce, she added.

The Center has so far reached 5,000 students through public school visits and trained 250 seventh-through twelfth-grade teachers to do biotech activities in their classrooms. Innovations such as a three-dimensional virtual reality demonstration of fermentation intrigue audiences at workshops, conferences and career fairs, Paulson noted. The Center's pilot facility for bioprocessing training has been expanded, thanks to U.S. Department of Labor funding. "We want the students to experience hands-on, real-life activities and to see the same equipment they will see on the job," Paulson affirmed.

Training teachers is also a priority for the Center of Expertise in Biomanufacturing at New Hampshire Community Technical College (NHCTC). This past summer, 75 biomanufacturing educators and leaders from across the U.S. and Puerto Rico attended the Center's BIOMAN program, a weeklong conference showcasing best practices in teaching. Presenters included representatives from Wyeth Pharmaceuticals and Lonza.

A nationally recognized apprenticeship program is another hallmark of NHCTC, noted Center Director Sonia Wallman. High school graduates enter a two-year associate's degree program that combines an intensive apprenticeship over two consecutive summers with 1,000 hours of class time. The program has yielded high-quality graduates and appeals to many students who are academically qualified but who do not want to attend a typical four-year program, Wallman explained. "We tantalize them with the opportunity to get their experience and training early."

Developing short courses on topics such as aseptic awareness is another active program at NHCTC, Wallman continued. "Most industries want very customized training. In fact, we've found that most don't even want their employees in the same classroom with other companies' employees!" NHCTC is making use of interactive technology during such courses, she added. As part of one eight-hour course, for example, Lonza employees are actually videotaped performing procedures in the

lab. They then view the tape with an instructor who offers a critique.

Biotechnology Field Offers more than Laboratory Jobs

Biology is now an information science. Understanding how digital information intersects all careers in biotechnology is essential to educators and those preparing to enter the field. Bio-informatics ignites discovery, process and production, and translates laboratory data to real-life applications such as health care, stated Patricia Dombrowski, Director, Life Science Informatics Center of Expertise, Bellevue Community College, Washington. Unfortunately, many people familiar with biotechnology do not know the field of bio-informatics even exists, she remarked. One of the Center's primary missions is to assemble researchers, administrators, practitioners and academicians to establish skills standards in areas such as clinical trial data management and software validation.

"We are now living in a bio-economy," Dombrowski told the group. "People do not realize that the bio-economy is data-driven. Everyone who works in the bio-economy, even marketing people, need to understand how to use data. The digitalization of biology and medicine, particularly the impact of genomic discovery, is now showing up at the doctor's office and in patient care at the hospital. We have to prepare students to handle that data."

Dombrowski urged the audience to think progressively about training future biotech and bio-informatics workers. She described a future where community colleges might teach students through Web sites such as Second Life, a virtual community for adults similar to what MySpace.com has become for teenagers. "Many of our community college students 'hang out' there, and we must reach them where they hang out," she told listeners.

To assimilate information from the many rapidly evolving fields of the bio-economy, collaboration among biotechnology programs nationwide will remain essential, stressed Elaine Johnson, Executive Director, Bio-Link Advanced Technological Educational Center, City College of San Francisco, San Francisco, California.

The Bio-Link Center was on the cutting edge when it began as a result of National Science Foundation funding in 1998, Johnson explained. Although biotechnology programs now exist all over the country, each has carved its own niche in addressing the needs of its local workforce. The many ways Bio-Link is working to track and enhance those efforts include gathering survey data from across the nation, building a national network, creating an online directory and online instructional curriculum and instructional materials clearinghouse, sponsoring national forums for idea-sharing, and even creating a laboratory "equipment depot" where industry partners donate used equipment to community colleges and high schools, she informed listeners. "We are here to figure out how to continue the momentum."

If past results are any indication, collaboration has been a tremendous success, stated Russ H. Read, Executive Director, National Center for the Biotechnology Workforce. Since its establishment two years ago through U.S. Department of Labor

funding, the Center's five member institutions have awarded more than 400 associate's degrees in biotech fields, trained over 1,000 workers through short, innovative courses, and reached hundreds of middle school and high school teachers and students. For these achievements, the Center received a Recognition of Excellence award from the Department of Labor last summer in Anaheim, California.

A key factor in the institutions' success has been "demand-driven training," Read told the audience. "When we do in-depth analysis and find out the needs of the companies, the net result is that we get an ideal employee because the skill set is right. The hands-on training and 'soft skills' preparation we provide equals qualified human capital. Apprenticeships and internships really work, and they often result in employment. And one of the key ingredients we have as a nation is this idea of collaborating. We're all in this together, and when centers work together, we form progressive models." □

A panel discussion by educators and industry leaders on finding and cultivating the best candidates for the biotech field.

Date: January 10, 2007

Location: Piedmont Triad Research Park, 115 South Chestnut Street, Winston-Salem, NC 27101

Panelists

Tim Bertram, DVM, PhD, Vice President, Science and Technology, Tengion, Inc., Winston-Salem, NC

Dr. Lucas Shallua, Chair, Biotechnology Program, National Center of Expertise in Biotechnology Research and Development Training, Forsyth Technical Community College, Winston-Salem, NC*

Ric Matthews, Director, National Center for Expertise in Bioprocessing Training, MiraCosta Community College, Oceanside, CA*

Alan Beard, Lead Instructor in Biotechnology, Forsyth Technical Community College, Winston-Salem, NC*

Regina Whitaker, Laboratory Technician, Targacept, Inc., Winston-Salem, NC

Danette Toone, Executive Director, Texas Biosciences Institute; Vice President, Advancement, Business, and Community Education, Temple College, Temple, TX

Janet Paulson, Project Coordinator, Bioprocess Training Center, Indian Hills Community College, Ottumwa, IA

Sonia Wallman, PhD, Director, National Center for Expertise in Biomanufacturing Training; Director, New Hampshire Community Technical College Biotechnology Program, Portsmouth, NH*

Patricia Dombrowski, Director, Life Science Informatics Center, Bellevue Community College, Bellevue, WA

Elaine A. Johnson, PhD, Executive Director, Bio-Link, Advanced Technological Educational Center, City College of San Francisco, San Francisco, CA

Moderator

Russ Read, Executive Director, The National Center for the Biotechnology Workforce, Forsyth Technical Community College, Winston-Salem, NC*

Sponsors

BioNetwork Pharmaceutical Center (www.ncbiornetwork.org)

Forsyth Technical Community College (www.forsythtech.edu)

National Center for the Biotechnology Workforce (www.biotechworkforce.org)*

National Science Foundation ATE Bio-Link (www.bio-link.org)

North Carolina Biotechnology Center (Piedmont Triad Office) (www.ncbiotech.org)

Piedmont Triad Entrepreneurial Network (www.pten.org)

Piedmont Triad Partnership (www.piedmonttriadinc.com)

Piedmont Triad Research Park (www.ideallianceinc.org)

Salem College (www.salem.edu)

Targacept, Inc. (www.targacept.com)

Temple College (www.templejc.edu)

Tengion, Inc. (www.tengion.com)

Winston-Salem Chamber of Commerce (www.winstonsalem.com)

Winston-Salem State University (www.wssu.edu)

Biotech Resource Web Sites

www.biomanufacturing.org

www.careervoyages.gov

www.bio-link.org

www.biotechworkforce.org*

*The National Center for the Biotechnology Workforce is the recipient of a Presidential High Growth Training Initiative Grant as implemented by the U.S. Department of Labor's Employment and Training Administration (www.workforce3one.org).

OFFERED AS A SERVICE TO THE BIOTECHNOLOGY WORKFORCE

© 2007 Medical Frontiers International Inc. All rights reserved. MFI Inc. is an independent medical news reporting service. This report is based on a meeting held on January 10, 2007, at the Piedmont Triad Research Park, 115 South Chestnut Street, Winston-Salem, NC 27101. This report was provided by Biotechnology Workforce through an educational grant without conditions and under written agreement that ensures independence. No claims or endorsements are made for any compound discussed which may be presently under investigation. This newsletter may be reproduced for educational purposes only. Information provided is not intended to serve as the sole basis for individual care. Our goal is to facilitate allied biotechnology workforce providers' understanding of ongoing trends in biotechnology. Your comments are encouraged.

Medical Frontiers International Inc., 301 N. Main St., #2207, Winston-Salem, North Carolina 27101

