BIOTECH
RESOURCE LINE
A NEWSLETTER TRACKING TRENDS IN BIOTECHNOLOGY

Building the Biotech Workforce

A report from the
National Center for the Biotechnology Workforce
Community College Program
Chicago, Illinois / April 9, 2006

Chicago - Data show that the need for biotechnology research and development technicians will increase by as much as 70% by the year 2012. To that end, biotechnology training and education leaders from around the nation—who have shouldered the task of preparing America's workforce for the anticipated increase in demand for more biotech personnel—gathered here in Chicago to impart and discuss the results of their coordinated and cooperative work. The daylong program presented grantees and their partners who are working together under federal initiatives that fund biotech workforce development programs through the President's High Growth Job Training Initiative in the Department of Labor Employment and Training Administration (DOL ETA) and the National Science Foundation's Advanced Technological Education (NSF ATE) Program.

"If I had to summarize the day's events I would pick two keywords: innovation and collaboration," stated Russ Read, Director, The National Center for the Biotechnology Workforce, a presenter at the Community College Program event. It was sponsored by the Council of Biotechnology Centers, an academic wing of the Biotechnology Industry Organization (BIO).

Speaker after speaker spoke about progress. In one innovative example, Biogen-Idec has set up a "community laboratory" being used for seventh-grade classes. "Simply having such effective leaders from all segments of the industry and regions together in one room for the first time contributes to our mission itself," affirmed Read, who heads the National Center Office (NCO) and coordinates the work carried out in its five national regions.

The positive impact these dedicated, national team players are having on the biotech industry was felt through strong presentations.

Beginning with a breakfast address by Gerhard Salinger, Co-Director, National Science Foundation Program, in support of workforce education and training, two morning panels followed that vividly presented successful industry-academic training partnerships. More than a hundred people attended the event, many seeking to start or improve their own biotechnology training programs. Gay Gilbert, Administrator, Department of Labor Employment and Training Administration's Office of Workforce Investment, gave a detailed luncheon address. The first afternoon panel focused on Bio-Link, the NSF ATE Center for Biotechnology, with Elaine Johnson, Bio-Link Executive Director and Chair. The wrap-up panel and conclusion set out the progress being made—and the work that remains to be done.

Creating a National Workforce Collaborative

When U.S. Secretary of Labor Elaine L. Chao first announced a $5 million grant to establish the National Center for the Biotechnology Workforce (NCBW) on June 28, 2004, it put into action the visions of five different community colleges from around the country. The grant enabled a real partnership to begin, one that represents the entire nation—through the colleges' five distinct regions—as well as the three emerging specializations of the biotechnology industry: research and development; bioprocessing / biomanufacturing; and bio-informatics.

Built on the traditional role of community colleges to serve local needs and forge productive collaborations with business, industry and other partners, the resulting strategic plan now being implemented (available at www.biotechworkforce.org) makes the NCBW a strong advocate for promoting America's strength in biotechnology by meeting the growing demand for a well trained biotechnology workforce.

Each regional center has achieved expertise in training that meets local, demand-driven workforce needs. Thanks to the National Center's facilitation, the group has become highly collaborative, collectively meeting and discussing issues that, although seeming to be regional in nature, are in fact common to each site.

The initiative has helped more than 400 students earn college degrees, while incumbent worker training and short innovative programs have reached another 680 individuals. More middle school and high school students and their teachers are being exposed to careers that biotechnology can provide. In only 18 months, the NCBW has developed some highly innovative ways of training individuals, from three-dimensional computer visualization to hands-on, safe bioreactor training.

Dissemination and replication of these innovations is also underway. The NCO ensures that products developed by the partners are posted to prominent and accessible Web sites. It has also developed this novel Resource Line newsletter that makes discoveries possible for others to learn about.

Innovations Converge in Chicago

Convergence was everywhere during the BIO world conference in Chicago. And it was not solely due to the 18,000 biotechnology companies, academic institutions, organizations, researchers, policymakers, journalists, venture capitalists and others coming together from across the United States and 31 other nations: research was converging with manufacturing; business converges with science; industry focuses on saving lives in healthcare converge with bio-fueled agricultural, industrial and environmental applications. New training innovations and discoveries also came together here.

Promises of biotechnology—to save lives, to boost business and to bring new jobs—are coming true now: a new bladder is "grown" in the laboratory using adult stem cells, and saves a young girl's life; bio-fueled hybrid cars, along with bold new programs to boost production of these bio-fuels, are coming on line. Everywhere you turn today, a biotech possibility is becoming reality.

No one doubts the profoundly positive changes biotechnology will bring to our world. The only major question left is, will there be enough skilled workers ready when needed?

Behind today's bio-business booms, federal plans initiated to help community colleges meet biotech's fast-paced human resource needs are also coming true through new partnerships and processes that deliver jobs and workers.

The NCBW supports regionally specialized biotech training centers. The work includes capturing best practices in the development of biotechnology skill standards, certification and curriculum, and then distributing them.

Executing this phase of its work, the NCBW makes replicable models of these best practices readily available to community colleges across America. This also means joining in public panels and events, like the Community College Program at BIO 2006.

"All of the regionally based five centers have worked hard towards achieving their niche mandates of excellence and expertise; combined together, we make a rich national resource. It's amazing to see all five regions of the United States (northeast, southeast, midwest, northwest, and southwest) converge together in one panel," enthused Read. "Focused on a collective purpose, the team has built national and regional presentations, Web sites, expert 'webinars' along with other vital resources, including applicable curriculum. These emerging standards are available through each site. Now these programs are being rolled out and replicated throughout the nation."

The important processes the NCBW are developing were showcased at the Community College Program: partnership models that combine talented education, business, and community leaders with other workforce providers for measurably improving outcomes. Themes of collaboration, innovation, and linking educational services with specific demands to achieve economic development and community benefits were heard throughout the day. Creating replicable models for these achievements, and distributing the results, were among the challenges also discussed.

Nationwide Innovations

Iowa Bioprocess Training Center

Janet Paulson, Director, National Center for Agricultural Bioprocessing and Renewable Fuels, Iowa Bioprocess Training Center, Eddyville, Iowa

In the heart of ethanol country, the nation's biggest bio-fuel producer, Iowa has one of its innovative projects on the road: a big mobile lab that rolls across the highways of the prairie.

Director Janet Paulson showed a slide of this very visible example of her creative collaboration with industry and a local area education agency (AEA). This "SEMI"—Science Educational Mobile Instruction Lab—has the equipment needed to assist teachers in conducting biotech experiments at a variety of schools.

"Having strong industry partners is essential to success," stressed Paulson, who also showed pictures of Indian Hills Community College, where a new $2.5 million pilot facility was built on land donated by nearby Cargill, an international provider of food, agricultural and risk management products and services

with 124,000 employees in 59 countries. "We are designing custom training in lab techniques with Cargill and others," she told the audience. A new pilot facility in partnership with a biotech entrepreneur employs student interns as it bioprocesses waste from a commercial egg-cracking operation.

MiraCosta Community College

Ric Matthews, Director, National Center for Expertise in Bioprocessing Training; Dean, MiraCosta Community College, Oceanside, California

With California-style positive thinking, MiraCosta College did not let a lack of funds interfere with hiring its much-needed biotech professor. They created a unique partnership with industry that resulted in a new jointly-funded faculty position in bioprocessing for two years. The college also worked with the San Diego chapter of the International Society of Pharmaceutical Engineers to design a new teaching facility and to obtain working drawings without any cost to the college. Through a partnership effort with the local biotechnology industry, the college obtained a significant donation toward the building of this new facility.

These collaborations have resulted in a new 3500-square foot teaching facility that is unique in Southern California. Many people in the audience could be seen taking notes, as Ric Matthews' talk sparked ideas for their own home states.

New Hampshire Community Technical College

Sonia Wallman, PhD, Director, National Center for Expertise in Biomanufacturing Training; Director, New Hampshire Community Technical College (NHCTC) Biotechnology program

Creating the first DOL Registered Apprenticeship in Biomanufacturing has helped attract more young people into NHCTC's Biotechnology Associate in Science degree program, thereby boosting an increasingly needed workforce. As it rolls out across the region, it has also resulted in one of the first active collaborations between the Department of Labor and the National Science Foundation to improve the biotech workforce.

The NSF Advanced Technological Education Regional Biomanufacturing Center, the Northeast Biomanufacturing Center and Collaborative (NBC2), adds an additional five collaborators (who are co-PIs and Hub Directors of the NBC2) who are working with DOL Apprenticeship offices in their respective states to bring the Biomanufacturing Apprenticeship throughout the northeast region's 12 states and the District of Columbia. This will help provide employers with a pipeline of workers as they expand and locate in the northeast. These same biomanufacturing workers will obtain the skills necessary to produce cells, proteins and other products driving the new bio-based economy. NHCTC is also working on the development of a DOL registered discovery apprenticeship focused on discovery research.

Forsyth Technical Community College

Lucas Shallula, PhD, Director, National Center for Expertise in Research and Development Training, Forsyth Technical Community College (FTCC), Winston-Salem, North Carolina

Lucas Shallula created unique research partnerships with outstanding medical programs at nearby Wake Forest University, including its Institute of Regenerative Medicine. FTCC biotech students work in a cutting-edge research laboratory, shoulder-to-shoulder with renowned scientists in the areas of drug discovery, research and development.

The college also has a unique partnership with MWG Biotech, a genomics company, to train both first- and second-year students in paid positions. MWG Biotech has also agreed to establish a training laboratory space on campus at Forsyth Tech that will make available DNA synthesis and medical diagnostic preparation technologies to faculty and students on a continual basis.

FTCC has articulation agreements in place with eight surrounding community and four-year colleges in which students complete their second year at the well-equipped Forsyth Tech.

Bellevue Community College

Patricia Dombroski, Director, National Center for Expertise in Life Sciences Informatics, Bellevue Community College, Seattle, Washington

Patricia Dombroski works with industry to develop biomedical informatics skill standards and curricula for community and technical colleges and high school learners. A Life Science Informatics focus group brought together scientists, administrators, practitioners and academicians from nationally and internationally recognized organizations such as the Fred Hutchinson Cancer Research Center, The Seattle Biomedical Research Center, Amgen, Microsoft, the University of Washington Genome Center, and Battelle. More than 60 participants assisted BCC in envisioning the architecture of an Informatics Skill Standards Development Model.

The resulting methodology assists community and technical colleges in efficient and economical program development in any industry sector dependent on Information Technology infrastructure. Using Life Science Informatics for the initial application, three new skill standards have been completed: Bio-informatics; Clinical Trials Data Management; and Software Validation in the Life Sciences. All these tools are now available to all educators through the www.workforce3one.org Web site.

The Health Information Management Systems Society (HIMSS), the world's largest life science informatics professional society, convened a panel to review the first application of the Rapid Development Skill Standards Development Model. Their exhaustive review praised both the methodology and the utility of the outcomes.

End of a Day of Ideas and Experiences

Speaking for the group at the conclusion of the meeting, Russ Read stated, "One thing we realized is that these leaders are so focused and dedicated to helping train new students and workers, improve the economies and bring new business and jobs to their hometown regions, we forget we share very common obstacles and challenges. We think everyone was surprised to hear how similar our different regions really are and how many new ideas and innovations they can take home and use right away." ❑

From left to right: Elaine Johnson, Lucas Shallula, Patricia Dombroski, Mike Fino, Janet Paulson, Ric Matthews, Sonial Wallman, Russ Read.

An Overview of the National Center of the Biotechnology Workforce Community College Program

A panel of industry and nationally acclaimed biotechnology training experts met to discuss innovative practices for the increasing demand of biotechnology workforce manufacturing/processing experts. Each panelist provided a quick "A,B,C," overview of what is biomanufacturing/processing and its training requirements.

Date: April 9, 2006

Time: 8:00 am-5:00 pm

Location: The Hyatt Regency Chicago, 151 East Wacker Drive, Chicago, IL 60601

Panelists

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

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

Janet Paulson, Director, National Center for Agricultural Bioprocessing and Renewable Fuels, Iowa Bioprocess Training Center, Eddyville, IA*

Patricia Dombroski, Director, National Center for Expertise in Life Sciences Informatics, Bellevue Community College, Seattle, WA

Lucas Shallula, PhD, Director, National Center for Expertise in Research and Development Training, Forsyth Technical Community College, Winston-Salem, NC

Moderator

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

Committed Sponsors

Sponsored by the Council of Biotechnology Centers of the Biotechnology Industry Organization.

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

OFFERED AS A SERVICE TO BIOTECHNOLOGY WORKFORCE

Medical Frontiers International Inc., P.O. Box 3083, Plattsburgh, New York 12901