

# Bio-Link Connection

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Newsletter of Bio-Link • The National Advanced Technological Education Center for Biotechnology

## BIO-LINK'S 17<sup>TH</sup> ANNUAL SUMMER FELLOWS FORUM

Bio-Link's 17th annual Summer Fellows Forum 2015 was once again hosted by the National Center located at City College of San Francisco (CCSF) from June 1 through June 5 at the Clark Kerr Campus conference site in Berkeley, California. Sixty-one Fellows comprised of community college instructors and high school teachers from across the nation participated in the weeklong forum.

The forum entitled "Looking to the Future" consisted of a variety of concurrent cutting-edge workshops, an Industry Tour at Joint BioEnergy Institute, informal meetings, networking, and at

the conclusion of the forum, the elegant annual dinner banquet.

As in the past, the forum afforded each Fellow the opportunity to profile their program at their school or college, to network and to share ideas and discuss issues that will continue to build the link between education and industry. A special Bridge to Biotech workshop session was held for those in attendance to reconnect at the forum since the Bridge Learning Community (BLC formerly Synergy) Pre-Conference was not funded this year.

The Fellows participated in workshops given by both Bay Area and National guest lecturers, who donated their time and supplies. Thank you to all the presenters, everyone appreciated your efforts! Once again this year, a complete list of the forum presenters and workshops, along with many of the workshop PowerPoint presentations are available for review on the Bio-Link website.

Thirty-five guests from CCSF and Bay Area industry also attended Bio-Link's 17th Annual Dinner Banquet on June 4. CCSF Chancellor, **Dr. Susan Lamb** and Bio-Link Executive Director, **Dr. Elaine Johnson** greeted and welcomed all the fellows and guests. **Dr. Linnea Fletcher** introduced **Dr. Richard Rhodes**, President/CEO of Austin Community College. Dr. Rhodes closed out the evening and the weeklong conference with his engaging and informative Keynote Address: "Student Success:



Drs. Bart Gledhill, Linnea Fletcher and Elaine Johnson (left to right), Bio-Link Co-PIs and Executive Director present a plaque of appreciation to Keynote Speaker, Dr. Richard Rhodes (right center) at Bio-Link's 17th annual Summer Fellows Forum dinner banquet.

Community Revitalization Through the Blending of Education and Industry".

If you are interested in attending the 2016 Forum/BIO Community College Program Day, tentatively save the dates of June 4-10 on your calendar and watch for important announcements and registration information on the Bio-Link website or in the *Connections* Spring 2016 Issue.

- Lisa Huffman  
Bio-Link Editor/Program Manager



Bernadette Galvan (left) and Dave Menshew (right) participate in BS4NM: The rAmylase Project - Mini-Prep of the New pAmylase Plasmid Workshop presented by Elyn Daugherty.

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## From the Director | Dr. Elaine Johnson



It continues to be an exciting time for Bio-Link and all of the Advanced Technological Education (ATE) Centers and Projects. Within the last month, Austin Community College received funding for an ATE Regional Center with Dr. Linnea Fletcher as the PI. Madison College and City

College of San Francisco received ATE Project funding for “Scaling Implementation of Stem Cell Technical Education: A Collaborative Project” with Dr. Thomas Tubon as the PI. Both of these examples illustrate the power of working together through the Bio-Link network. I hope that many more such collaborations will develop and grow over the coming year.

There will be ample opportunity to foster new relationships and partners. One of these will take place in June 2016 when the BIO International Convention returns to San Francisco. We hope to combine the Bio-Link Summer Fellows Forum, the Community College Program, and the chance to participate in the BIO Convention during the first week in June. If you have suggestions that will help us plan these

activities, please send them to me or another member of the Bio-Link Leadership Team. It is only with the help of everyone, that we can make this time together meaningful for all.

One goal of Bio-Link is to utilize the robust national network of information sharing to foster communities of practice that enhance the preparation of skilled technicians. A **community of practice** is a learning partnership among people who learn from and with each other and join forces in making sense of and addressing challenges they face individually or collectively (Wenger et al., 2011). A **network** refers to a social network or a set of connections among people. While communities of practice and networks are closely related and often intertwine, the key difference is in intention and duration. We are now at a point where we have worked together and are open to engaging new people that have a commitment to growing together.

We are currently developing Bio-Link Circles that are structured work groups that can facilitate getting projects accomplished. An Outreach Circle has produced a video that showcases working technicians and where they attended biotechnology programs. We expect Circles to expand this year and contribute building a strong community of practice.

## Second Stem Cell & Regenerative Medicine Education Summit Empowers Instructors

Thirty-one educators from around the country spent a week in June learning about stem cells, regenerative medicine, and the latest advances in cell culture technologies. This workshop was held at Madison Area Technical College (MATC) in Madison, WI and was co-hosted by faculty from MATC and the City College of San Francisco (CCSF). Participants practiced a variety of stem cell culturing techniques and also learned about some of the most exciting breakthroughs in biology, including genomic editing and 3-D printing of tissues. Summit participants shared instructional materials and strategies for bringing stem cell and regenerative medicine into educational settings ranging from middle schools to pre-professional college programs. The promise of regenerative medicine is a powerful motivator for students and stem cell education is an effective way to introduce students to the intricacies of living systems.

This Stem Cell Summit was supported by a National Science Foundation ATE grant. We are pleased to announce that although the grant that funded this workshop has ended, a new grant relating to stem cells and regenerative medicine is just beginning! (See the announcement on page 3 for more information about the new grant.) We are looking forward to developing and disseminating materials to make stem cell and regenerative medicine education ever more widely available to students around the country.

- Lisa Seidman, Ph.D.  
Bio-Link Co-PI



Dr. Tom Tubon demonstrates proper handling of stem cells to Summit participants.



Stem cell Summit participants on a field trip to visit Madison stem cell companies.

## New ATE Regional Center Funded at Austin Community College

The Austin Community College (ACC) Bio-Link Regional Advanced Technological Education Center for Biotechnology and Life Science was funded in the amount of \$2,999,962 by the National Science Foundation (NSF) in September 2015. It shares the same overall goals as the Bio-Link National Center, but focuses on Texas and Kentucky for the purpose of developing models and practices that can be disseminated throughout the Bio-Link network.

The primary goal of this Regional Center is to develop a model where by Bio-Link “best practices” for educating the workforce and supporting industry can be embedded within a state’s educational, workforce and political system so that goals and activities remain once NSF funding for the center ceases. This model can then be applied to other states. Secondary goals, which will aid the obtainment of the primary goal, are the development of new student recruitment pipelines focusing on feeder courses both in the K-12 and postsecondary education system (e.g. 9th grade and freshman majors and non-majors Biology), the establishment of more Contract Service Organizations (CSOs) such as the wet lab incubator being built at ACC, the establishment of universal articulation agreements among secondary and postsecondary educational institutions, and the establishment of an entry-level certificate in both high schools and community colleges.

Co-PI Partners on this grant include Dr. Deborah Davis at Bluegrass Technical College in Kentucky, Dr. Rob Hatherill at Del Mar College in Texas, and Dr. Bridgette Kirkpatrick at Collin County Community College in Texas. Dr. Davis and her group plan to build a CSO at their institution and help develop the statewide Bio-Link model that can be disseminated across the nation. Based on Del Mar’s previous successes as a result of ATE funding in promoting undergraduate research in Biotechnology and Biology, their work on the HHMI Sea Phage Project, and recent involvement in CCURI, Dr. Hatherill will lead the effort on developing new student recruitment pipelines using biotechnology-related undergraduate research in feeder courses and in Biotechnology Programs.

Dr. Kirkpatrick will focus on developing universal articulation agreements and an articulation system that will ensure students can seamlessly move from high schools to 2-year schools to 4-year schools across Texas. It will also allow them to pilot new agreements that are cross-disciplinary such as from environmental science to biotechnology.

Finally, this Regional Center will help the National Center establish the circles and groups across the nation that are interested in working on similar activities. It is time for Bio-Link Best Practices to be embedded across the Nation!

- Linnea Fletcher, Ph.D.  
Austin Community College



Wes Moore (left) and Tammy Jamieson (right), Biotechnology Program students at BCTC in Lexington, KY, learn the basics of gel electrophoresis. Here they are preparing an agarose gel to separate DNA fragments that was isolated from *Soldiagio gigantean* (Goldenrod), the KY State Flower.

## CCSF & MATC Collaborate on New Stem Cell Technologies ATE Project Grant

For the past few years, City College of San Francisco (CCSF) and Madison Area Technical College (MATC) have each conducted separate ATE projects related to stem cell technologies and regenerative medicine. The new project, “Scaling Implementation of Stem Cell Technical Education: A Collaborative Project” will build on the momentum and connections that these previous projects generated in order to empower educators nationwide through wider dissemination of instructional materials. Looking beyond pre-professional education for technicians, stem cells and regenerative medicine have also demonstrated a remarkable potential to spark student interest in STEM careers. To take full advantage of this, modular instructional materials for a variety of academic settings will be developed to support educators in their efforts to engage students across a broad range of educational levels. Professional development workshops for educators will be offered in years two and three.

For more information contact Dr. Tom Tubon (tubon@madisoncollege) at MATC or Bob Del Vecchio (robert.delvecchio@mail.ccsf.edu) at CCSF.

- Jeanette Mowery, Ph.D.  
Madison College

# Fellows Forum Highlights



## Summer Fellows Forum Participants

### Northeast Region

Bushra Noman

### North Central Region

Chuck Crabtree  
Deborah Davis  
Susanne Helms  
Eilene Lyons  
Erinn Mee  
Jeanette Mowery  
Lisa Seidman  
Thomas Tubon  
Melinda Verdone  
Misty Wehling  
Kathie Whelchel  
Melinda Wilson  
Luanne Wolgram

### Northwest Region

Kendra Hill  
Candiya Mann  
Sandra Porter  
Todd Smith

### Southeast Region

Clint Coleman  
Stacie Deaver  
Brent Fodera  
James Guenther  
Tamara Mandell  
Toby Mapes  
Jeff Rapp  
Bill Woodruff

### South Central Region

Linnea Fletcher  
Rob Hatherill  
Katherine Henry  
Bridgette Kirkpatrick  
Deborah Overath  
Carole Twichell

### Southwest Region

Leslie Blackie  
John Carrese  
William Cruz  
Ellyn Daugherty  
Bob Del Vecchio  
Dot Eppler  
Jing Folsom  
Bernadette Galvan  
Jennifer Garner  
Bart Gledhill

### Southwest Region cont.

James Harber  
Diana Hurlbut  
Elaine Johnson  
Edie Kaeuper  
Katherine Krolikowski  
Karen Leung  
James Lewis  
Erin McKay  
Dave Menshev  
Daniel Michael  
Paul Nagami  
Vivian Ngan-Winward  
Sara Sandhu  
Barb Wenger  
Carin Zimmerman



# Save the Date!

Bio-Link's 18th Annual Summer Fellows Forum & The Community College Program Day at BIO 2016

**June 4-10, 2016**

Berkeley & San Francisco, CA  
Info & Registration coming soon

**[www.bio-link.org](http://www.bio-link.org)**



## Bio-Link and Pellet Productions Collaborate to Produce Interactive Movie: "Quality in Biomanufacturing"

Learning how to navigate within a biomanufacturing quality system isn't something that can be taught easily in a classroom. A technician's error can cost a company millions of dollars, lead to investigations by the FDA, or worse, cause harm to a patient. To help students learn about working in a regulated workplace, Bio-Link, and Pellet Productions, Inc.—the creators and producers of ATETV.org—have come together to produce "Making The Call: Quality in Biomanufacturing." This interactive movie series lets students experience (virtually) the issues faced by real production employees, immersing them in a world where "quality" is paramount.

In this interactive teaching tool, students will choose to play one of three characters working in a fictional production plant. Through a series of video vignettes, students will follow their character through his/her work routine, contributing to the manufacture of a quality product. Each scene terminates at a decision point – choices that would have to be made on the job. At this time, the student will choose one of the options presented and, in the next scene, immediately see the consequences of their decision. As students work their way through the interactive movie, they will experience the demands of a real-world production job and learn how their own decisions can impact product quality. Bio-Linkers, Pellet Production staff and industry professionals have consulted on development of the script with filming set to start in November. We are planning a release party this summer at Summer Fellows Forum. Stay tuned for further details.

- Jeanette Mowery, Ph.D.  
Madison College



## In Memoriam – David Collins

We are indeed saddened by the passing of David Collins after a long illness. David is survived by his partner and their two sons. David was a long time Classified Employee at City College of San Francisco and in the last 12 years had dedicated himself to his work at the Bio-Link Equipment Depot. Through his work he was able to help hundreds of teachers get valuable donated equipment and supplies to run their science programs.

**He will be greatly missed.**

## HI-TEC 2015 HI-LIGHTS

The seventh annual HI-TEC Conference took place at the Portland Marriott Downtown Waterfront in Portland, Oregon from July 27-30. HI-TEC is a National Conference on Advanced Technical Education where technical educators, counselors, industry professionals, and technicians can update their knowledge and skills. HI-TEC uniquely explores the convergence of scientific disciplines and technologies. It is an opportunity for community and technical college educators and stakeholders seeking professional development opportunities, educational materials, collaborative ventures, and insights into emerging market trends to develop and advance the technical workforce of the 21st century.

Bio-Link presented the highly popular session “Learning from Working Technicians who tell their stories from ATE Programs” that featured three technical professionals from different fields who provided insights into their technical education. They told their stories and shared their work experiences to help educators design learning experiences to prepare them for the workforce.

The “fishbowl” session was introduced by Elaine Johnson, the Executive Director of Bio-Link. Terryll Bailey of The Allison Group moderated the energetic and informative panelists: Scott Coombe of AMSEC, Dean Mann of Nucor-Vulcraft and Aliyah Suliaman of University of MO Agro Bacteria Microbiology Lab. All spoke candidly about their previous education and careers, skill preparation, about technical careers and what is important for educating the technical workforce, giving credit and thanks to their “Mentors” who were present in the audience.



Back Row (left to right) Elaine Johnson, Bio-Link, Ross Leach (Mentor), AMSEC, Eilene Lyons (Mentor), Bio-Link, Elaine Craft (Mentor), SCATE, Terryll Bailey, The Allison Group  
Front Row (left to right) Dean Mann, Nucor-Vulcraft, Aliyah Suliaman, University of MO Agro Bacteria Microbiology Lab, Scott Coombe, AMSEC

Bio-Link was once again a Producer for this year’s conference and also exhibited at the two-day Technology Showcase where new connections were established and many colleagues were reunited. HI-TEC 2016 will be held at the Wyndham Grand Hotel, in Pittsburgh, PA from July 25-28, 2016 and planning is already underway. For more information visit the HI-TEC website at [www.highimpact-tec.org](http://www.highimpact-tec.org)

- Lisa Huffman  
Bio-Link Editor/Program Manager

# Bachelors of Biomanufacturing at Two California Community Colleges

On September 28, 2014, California Governor Jerry Brown signed SB 850 into law. This legislation authorized 15 of the 113 California Community Colleges to develop a baccalaureate degree program in a single field. By May 2015, the Board of Governors (the governing body that oversees the community college system) had selected the 15 colleges that would pilot this program. The legislation specified that no program could overlap any Bachelors program already offered at any colleges in the California State University (CSU) or University of California (UC) systems. The new Bachelors programs included Respiratory Technology, Dental Hygiene, Mortuary Science, Airframe Manufacturing, Automotive Technology, and Biomanufacturing. Since some campuses of the CSU system had "Biotechnology" programs, and one campus of the UC system had an undergraduate Biotechnology degree, MiraCosta College and Solano Community College proposed a Bachelors in Biomanufacturing. Training technicians for the manufacturing sector of the biotech industry had already been the specialty of these two colleges.

Curriculum development for ten new upper division courses began in earnest during the summer and will continue. The upper division courses will begin to be offered in Fall 2017, and the first Bachelors class will graduate in Spring 2019. These courses will be stacked upon the current Associate degree (with the biotechnology courses and the current General Education requirements). Although there will be additional discussion, currently the planned upper division courses will be:

## **Biomanufacturing Science and Technology**

- Process Sciences (lecture/laboratory)
- Design of Experiments for Biomanufacturing (lecture/laboratory)
- Design of Biomanufacturing Processes and Equipment (lecture/laboratory)
- Bioprocess Monitoring and Control (lecture/laboratory)
- Seminar in Biomanufacturing Technologies (seminar)

## **Biomanufacturing Quality**

- Statistical Process Control (Lecture/Laboratory)
- Global Quality System Regulation (Lecture)
- Six Sigma and Lean Manufacturing (Lecture/Laboratory)
- Methods in Quality Improvements and Investigation (Lecture/Laboratory)
- Seminar in Biomanufacturing Quality (Seminar)

California has developed a system to standardize course content across the 113 community colleges and across the California State University system called the C-ID, the Course Identification Numbering System, an agreed upon curriculum for standard courses. Students from other community colleges who grant an Associate in Biotechnology whose courses adhere to the course C-IDs will be able to transfer in. The upper division courses will be aligned with professional certifications offered by industry organizations to the extent possible; for example, students completing the six sigma/lean manufacturing course would be prepared to take the exam for a belt offered by the American Society for Quality. The legislature specified that this should not necessarily be a terminal degree; the Bachelors will be aligned with professional Masters programs offered by the CSU systems.

One of the most exciting elements of this project is the cost to the student. Students will be able to complete a four-year degree for under \$10,000 and therefore leave college without debt. Also, since the programs are designed specifically to articulate with a community college Associate degree, there will be no loss in units upon transfer. These programs provide students with yet another education option to train for their biotech career. The challenges of implementation are daunting, but the future benefit for students should make the hard work of implementation worthwhile

*- Jim DeKloe, Professor  
Solano Community College*

## **Announcing a New Course-in-a-Box!**

Bio-Link has posted a new Course-in-a-Box, "Hazardous Materials." Contributed by Mary Ellen Kraus, instructor at Madison Area Technical College, this course is designed with information, and classroom develop a safety will find lectures, outline, handouts and other valuable Technical College, this to provide students laboratory exercises, activities to help them "mindset." Instructors a syllabus, course for labs and activities, resources that can be incorporated into a variety of programs. Various types of hazardous materials are covered, including, but not limited to chemical and biological hazards.



## **SAVE THE DATE!**

### **12th Annual Worthington Bio Conference**

**April 7 & 8, 2016**

Worthington Event Center  
Worthington, MN

[www.worthington-minnesota.com](http://www.worthington-minnesota.com)

[Grow@worthington-minnesota.com](mailto:Grow@worthington-minnesota.com)

# Save the Date!

## High Impact Technology Exchange Conference

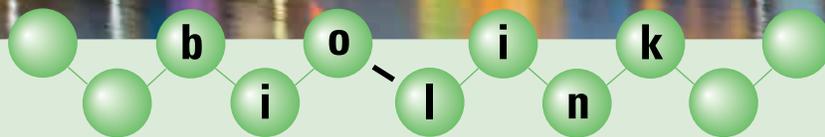
*Educating America's Technical Workforce*



Wyndham Grand  
Pittsburgh, PA

July 25–28, 2016

[www.highimpact-tec.org](http://www.highimpact-tec.org)



## National Center

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**Bio-Link** is committed to program improvement, instructor enhancement, communication, program assistance, and supporting school-to-career activities in the biotechnology area.

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