



# CSBI

CSBI Workforce Development Best Practice Session:  
***Innovative Industry-Academic Partnerships***

CSBA Retreat, Nashville, TN

November 30, 2016

# Best Practice Panel

- **MISSOURI**: Bio Research & Development Growth (BRDG) Park  
**Dr. Richard Norris**, Director, Center for Plant and Life Sciences,  
St. Louis Community College
- **UTAH**: BioInnovations Gateway / Medical Innovations Pathway  
**Kelly Slone**, President & CEO, BioUtah
- **TEXAS**: Austin Community College Incubator  
**Dr. Linnea Fletcher**, Biotech Department Chair, Austin  
Community College/Bio-Link
- **TENNESSEE**: Vanderbilt ASPIRE Program, Biomed Research  
Education and Training Office of Career Development  
**Dr. Ashley Brady**, Dir. of Career Engagement and Strategic  
Partnerships, Vanderbilt University School of Medicine



# CSBI

**MISSOURI:** Bio Research & Development Growth  
(BRDG) Park

**Dr. Richard Norris**, Director, Center for Plant  
and Life Sciences, St. Louis Community College

# Bridging the Gap in STEM Education



# CPLS Purpose

- Create a district Center of Excellence supportive of plant and life sciences
- Build strategic relationships with plant and life science industry partners
- Support the efforts of related programs
- Assist expansion of programs with grants
- Provide K-12 educational activities

# Funding for CPLS at BRDG Park

- CPLS formed strategic alliances with the Danforth Center and Wexford Scientific
- External funding made this possible:

<b>Federal earmark NASA grants</b>	<b>\$1,100,000</b>
<b>State Tax Credits</b>	<b>500,000</b>
<b>National Science Foundation</b>	<b>679,487</b>
<b>MO Lewis and Clark Fund</b>	<b>500,000</b>
<b>NSF LSAMP Grant (5 year)</b>	<b>125,000</b>
<b>MySun Foundation</b>	<b>25,000</b>
<b>Mallinckrodt</b>	<b>25,000</b>
<b>Dept. of Ed. Grant</b>	<b>213,000</b>
<b>Monsanto Fund</b>	<b><u>275,000</u></b>
	<b>\$3,442,487</b>

# STLCC's Commitment at BRDG Park

1. A 15-year lease
  - 10,500 square feet of first floor
  - start date October 2009
2. Legal contracts with start-up businesses within BRDG Park to provide:
  - Laboratory space
  - Use of laboratory equipment
  - STLCC Program interns as laboratory technicians

# Center for Plant and Life Sciences

- Primary Goal –Education
  - Outreach
  - Life Sciences Lab Assistant Program
  - Biotechnology Program





# Biotechnology Program

- Technical program
- 80% hands-on training in lab
- Developed with industry involvement
- Small but very successful



# Bio-Bench Contract Research Organization

- Can we help you?



- Laboratory access
- Project assistance
- Equipment
- Interns
- Other support?



# Lab Use Agreement

- Set up and use our laboratory space
- Use any equipment within our lab space

- Consumables



- Assignment of Intern if available



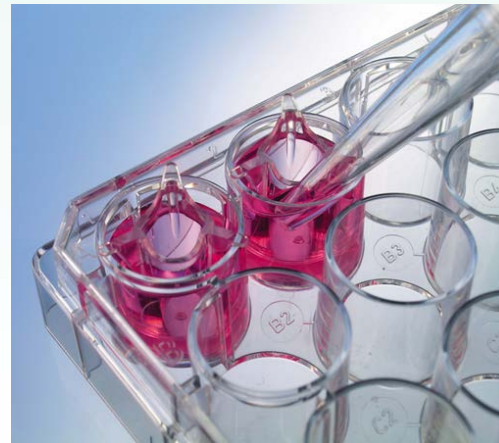
# Project

- Defined work
- Other tasks you might send out
  - Sequencing
  - qPCR assay
  - Flow cytometry
  - Culture maintenance



# Equipment Usage

- High Tech Instrumentation
- Usage cost varies per instrument





# Small Companies

- Limited funds
  - Imager
  - \$25,000
  - Lab use to access
- Limited people
- We could assist with both
- Limited and full lab use agreements

STAIN-FREE  
ENABLED



# NewLeaf Symbiotics

- Pink Pigmented Facultative Methylootrophs (PPFMs)
- Bacteria that grows on plants
  - Metabolize waste products from plant
  - Produce nutrients beneficial to plants
  - Symbiotic



# NewLeaf Symbiotics

- Early 2012
- Only lab space within STLCC
- Assigned 3 interns to assist
- One Lead Scientist





# NewLeaf Symbiotics



- By Jan 2013
  - \$7 million in funding
  - Established lab facilities ground floor BRDG Park
    - Tom Laurita, Stephen Kahn
    - East Coast
    - Opted to remain in St. Louis
  - Hired 3 former interns



# NewLeaf Symbiotics

- Summer 2014
  - \$17 million in funding
  - Expanding current operations and facilities





- For a short video featuring a startup tenant of St. Louis' Bio Research & Development Growth (BRDG) Park, visit:

<https://youtu.be/h92lvTtf9QI>



# CSBI

UTAH: BioInnovations Gateway / Medical  
Innovations Pathway

**Kelly Slone**, President & CEO, BioUtah

# Utah's BioInnovations Gateway (BiG)

- Collaborative between Granite School District and USTAR
- Incubator and a contract research resource for Utah's life sciences industry
- Supports up to 16 resident companies, providing access to state-of-the-art biotech, biomanufacturing, and engineering design & prototyping equipment
- Wet and dry labs, clean rooms, offices, and meeting space are the main components

# BiG = Workforce Training

- One of the first projects of its kind nationally
- Integrates high school education and training with life science start-up incubation
- Students work side-by-side with resident company staff and may earn high school and college degree credit
- Co-located with the Biomanufacturing Program of the Granite Technical Institute, which provides specific and industry-focused training for entry-level positions in the pharma, diagnostics, medical and natural products industries

# Medical Innovations Pathways

- \$300K Utah Cluster Acceleration Program (UCAP) Grant
- Provides students the opportunity to graduate high school with a certificate in medical manufacturing innovations and begin a career in life sciences
- First semester takes place in high school; second semester implements curriculum in partnership with the Salt Lake Community College
- Students will also participate in internships and job shadow experiences with life science companies who are involved in the program
- Partnership include: Industry, Governor's office of economic development, three school districts, Salt Lake Community College and State School Board of Education



# Industry Partners

Get the Certificate during your senior year  
and qualify for an Entry-Level Position at:





# Academic and Gov't Partners

## Certificate Program Supported By:



Utah Governor's Office of  
Economic Development  
BUSINESS • TOURISM • FILM



BIOUTAH



Department of Workforce Services



USAFunds®

Salt Lake  
Community  
College



Utah Cluster  
Acceleration  
Partnership  
UCAP



# Medical Innovations Pathways

- For a short video on Utah's BioMedical Innovations Pathway program, visit:

<https://www.youtube.com/watch?v=W3OKoBBvvDM>



# CSBI

TEXAS: Austin Community College Incubator

**Dr. Linnea Fletcher**, Biotech Department Chair,  
Austin Community College/Bio-Link

## AC2 Bio-Link Regional Center

- Funded by National Science Foundation
- Overall Goal: Train the Workforce Starting with Middle School Up Through 4-YR and Higher
- [www.ac2-bio-link.org](http://www.ac2-bio-link.org)



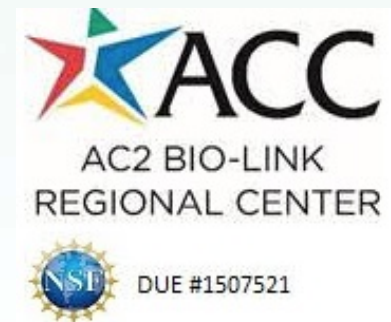
## Texas Healthcare and Bioscience Institute

- Develop and advocate policies and actions that promote biomedical science, biotechnology, agriculture and medical device innovation



# What was the impetus for the collaboration? What problem did it seek to solve/address?

- Partnership started in 1999 for the purpose reaching Texas industry
  - THBI validated “Bio-Link” and what the center could do for industry



# How did you work together to develop the initiative? How was/is it funded?

Co-hosted meetings and Bio-Link was invited to serve on the Governor's Bioscience Council



# Outcomes

- Emerging Technology Fund Grant to build a wet lab incubator at Austin Community College
  - Opening Ceremony –Jan 31, 2017
- Industry Survey Conducted by THBI



# Future Activities

- Helping High School Biotechnology Programs
  - Starter Package for Teachers
    - Curriculum
    - Teacher's Manual
    - Equipment
    - Professional Develop



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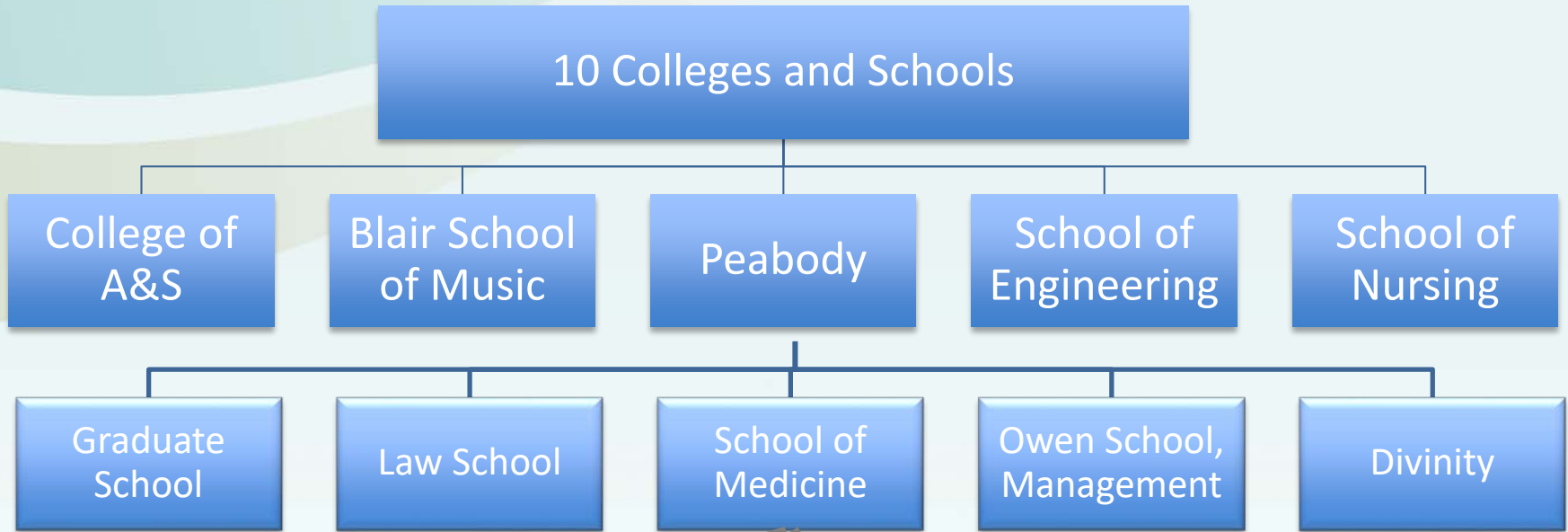


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**TENNESSEE**: Vanderbilt ASPIRE Program, Biomed Research  
Education and Training Office of Career Development

**Dr. Ashley Brady**, Dir. of Career Engagement and  
Strategic Partnerships, Vanderbilt University School of  
Medicine

# Vanderbilt University-Nashville, TN

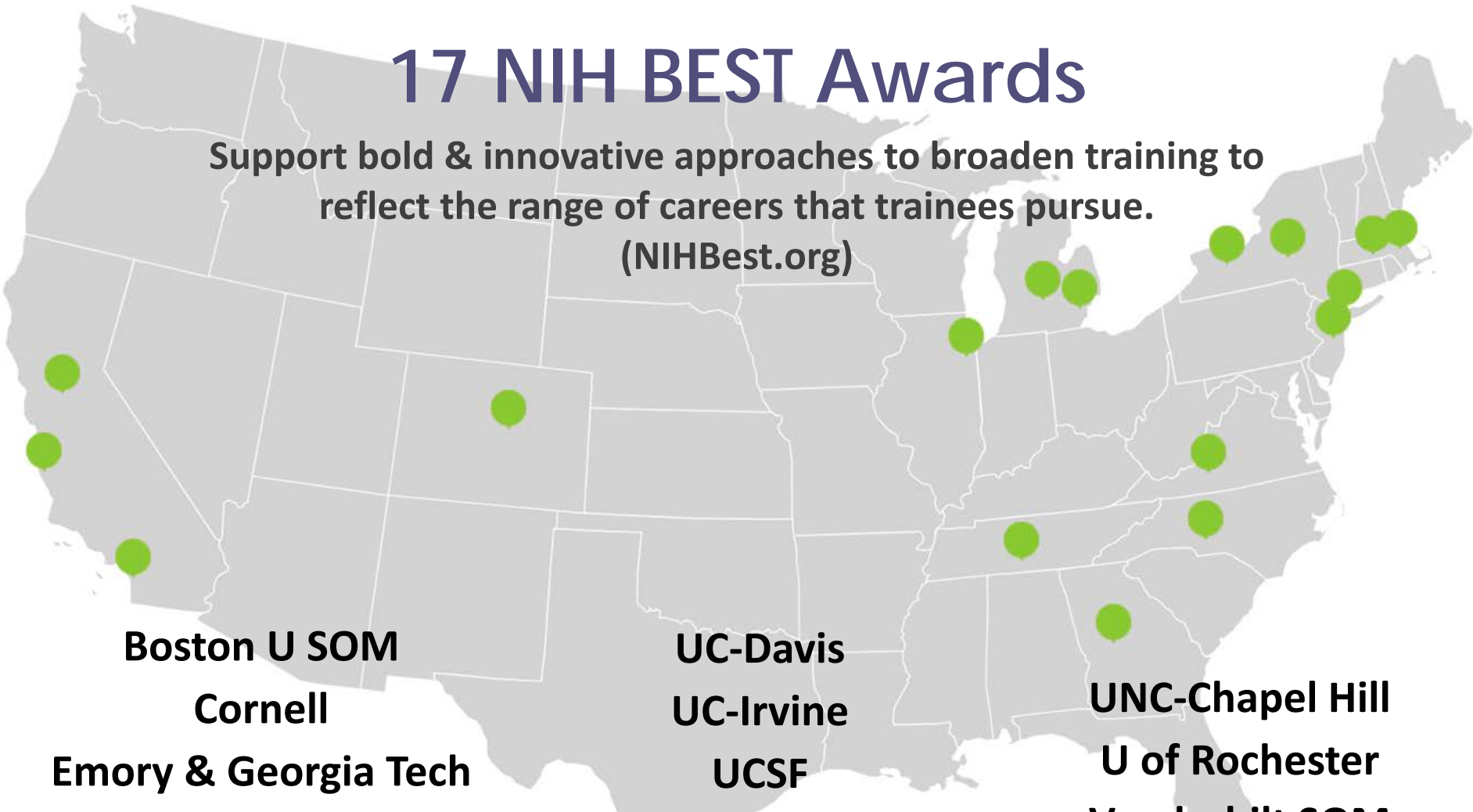


~ 650 basic biomedical sciences  
PhD students in 15 PhD programs

~450 basic biomedical sciences  
postdocs in 25 programs/depts

# 17 NIH BEST Awards

Support bold & innovative approaches to broaden training to  
reflect the range of careers that trainees pursue.  
(NIHBest.org)



**Boston U SOM**  
**Cornell**  
**Emory & Georgia Tech**  
**Michigan State**  
**NYU SOM**  
**Rutgers**

**UC-Davis**  
**UC-Irvine**  
**UCSF**  
**U of Chicago**  
**U of Colorado | Anschutz**  
**U Mass Medical School**

**UNC-Chapel Hill**  
**U of Rochester**  
**Vanderbilt SOM**  
**Virginia Tech**  
**Wayne State**

business development

defense & intelligence

# What are Biomedical PhDs Doing?

Industry R & D

start-ups & entrepreneurship

government administration

data management

nonprofit management

medical communications

academic  
administration

journalism

patent law

publishing

>75%

science policy

consulting

technology transfer

regulatory affairs

science outreach

technical sales

K-12 education

venture capital

clinical research

grants management

# Opportunities for Industry Partnerships

- ASPIRE Modules:
  - 1) Technology Commercialization
  - 2) Management and Business Principles for Scientists
  - 3) Intro to Principles and Practice of Clinical Research

In the future:

- Policy
  - Regulatory
  - Project Management
- Externships/  
Internships



# ASPIRE Internships and Externships

Internships (36 positions, 29 participants, 69 applicants)

- Part- or Full-time, 10-12 weeks,
- Paid
- Professional hands-on experience
- Engaged in an in-depth project
- Med comm, biotech, patent law, outreach, policy etc..

Externships: (25 participants)

- 1-3 day job shadowing/site visit
- Unpaid
- Engaged in a small project or team meetings
- Participate in a company tour and meet with professionals

# How VU and Life Sci TN work Together

- Open lines of communication- meet in person regularly and phone calls
- Help with identifying companies to target for Internships
- Promoted our program with the LST Board
- Featured us on LST podcast
- Students present posters at annual conference
- Hosted two interns last year: policy and conference planning
- Support the LST Academic Alliance Chapter







**Ashley E. Brady, Ph.D.**  
**ASPIRE Program Manager &**  
**Dir. of Career Engagement and Strategic Partnerships**  
**BRET Office of Career Development**  
**Vanderbilt University School of Medicine**  
**[ashley.brady@vanderbilt.edu](mailto:ashley.brady@vanderbilt.edu)**

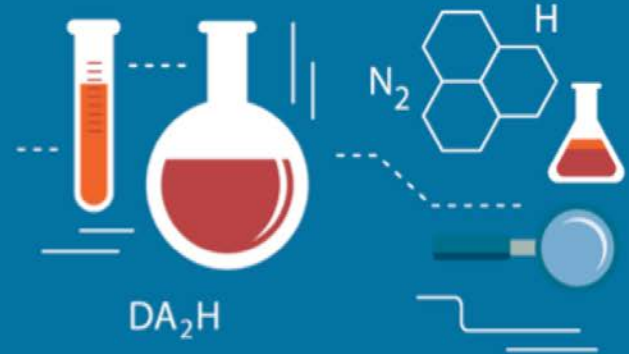
**Thank you!**



THE COALITION OF STATE BIOSCIENCE INSTITUTES (CSBI):

# 2016 LIFE SCIENCE WORKFORCE TRENDS REPORT

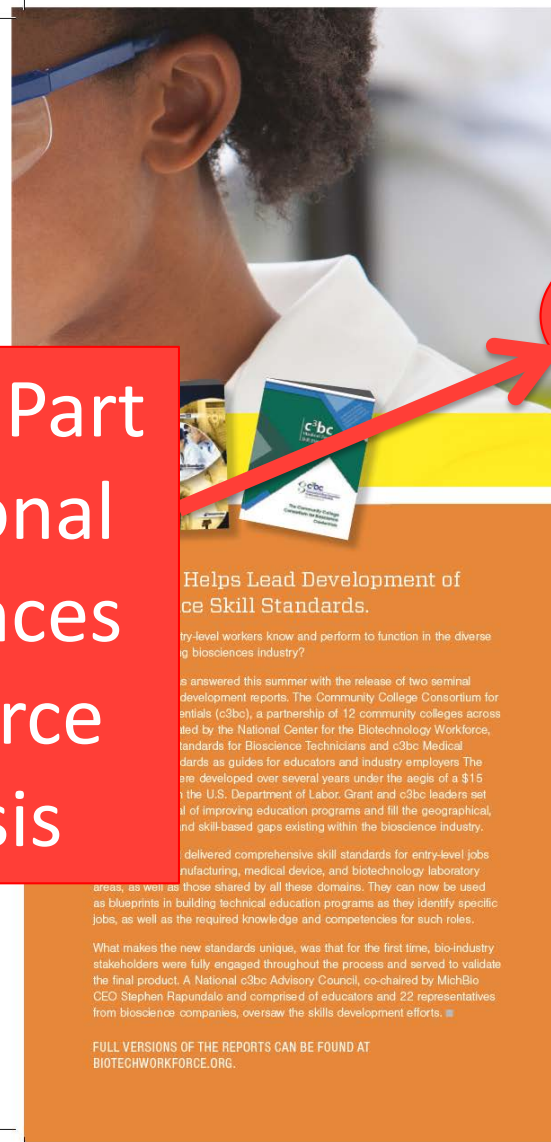
KEY REPORT FINDINGS<sup>1</sup>



## Leveraging 2016 / MichBio Examples Planning for 2018



# MichBio Part of National Biosciences Workforce Analysis



## FEATURE STORY



### MichBio Part of National Biosciences Workforce Analysis.

The Coalition of State Bioscience Institutes (CSBI), of which MichBio is a member, recently released the National Biosciences Workforce Trends Report that provides a national snapshot of the talent needs in the life sciences industry.

Over a hundred senior executives offered important insights, including Michigan companies like Diplomat, Ferndale Pharma, Molecular Imaging, Inc., MPI Research, NSF International, Pfizer, Terumo Cardiovascular and Zoetis. Several themes emerged regarding current hiring practices and future workforce needs.

The significance of soft skills cannot be underscored enough, especially an ability to communicate effectively, possess excellent interpersonal skills and work collaboratively in teams. In addition, having talent with strong critical thinking and problem-solving skills was viewed as essential for business success. Second, ongoing employee training and development was deemed critical for talent retention and keeping employee's technical and business skills relevant.

Employers recognized two areas of future workforce need: 1) those proficient in all aspects of "big data" collection and management, including database managers, bioinformaticists, and biostatisticians, and 2) professionals with a deep understanding of the changing regulatory and compliance requirements, along with pricing and reimbursement regulations, for all stages of the bioscience business life cycle. ■

FOR A FULL VERSION OF THIS REPORT, VISIT [CSBIINSTITUTES.ORG/WORKFORCE-DEVELOPMENT](http://CSBIINSTITUTES.ORG/WORKFORCE-DEVELOPMENT).

BIOMATTERS | FALL 2016 | 9

### Helps Lead Development of c3bc Skill Standards.

entry-level workers know and perform to function in the diverse life sciences industry?

It was answered this summer with the release of two seminal development reports. The Community College Consortium for Biosciences (c3bc), a partnership of 12 community colleges across Michigan, in partnership with the National Center for the Biotechnology Workforce, released standards for Bioscience Technicians and c3bc Medical Standards as guides for educators and industry employers. The standards were developed over several years under the aegis of a \$15 million grant from the U.S. Department of Labor. Grant and c3bc leaders set out to improve education programs and fill the geographical, skill-based and skill-based gaps existing within the bioscience industry.

The standards delivered comprehensive skill standards for entry-level jobs in manufacturing, medical device, and biotechnology laboratory areas, as well as those shared by all these domains. They can now be used as blueprints in building technical education programs as they identify specific jobs, as well as the required knowledge and competencies for such roles.

What makes the new standards unique, was that for the first time, bio-industry stakeholders were fully engaged throughout the process and served to validate the final product. A National c3bc Advisory Council, co-chaired by MichBio CEO Stephen Rapundalo and comprised of educators and 22 representatives from bioscience companies, oversaw the skills development efforts. ■

FULL VERSIONS OF THE REPORTS CAN BE FOUND AT [BIOTECHWORKFORCE.ORG](http://BIOTECHWORKFORCE.ORG).

# 2018 Planning

MassBio looks to MBEF for workforce expertise / Full Report & Quarterly Snapshots

Identify Critical Mass Q1 2017

Identify Funding Sources Q1/Q2 2017

Refine process Q3 2017

Data collection Q4 2017 / Q1 2018