

NCBW TIMELINE

Oct. 2018 Click dashed-line entries for more info

October 2008 Agreement with the North Carolina Community College System established NCBW as one of seven BioNetwork centers.

Bellevue CC Informatics

- Co-hosted 78 state educators at Washington Community College Summit 2006
- Program featured in the industry journal: *BIO-IT World*
- At the IT Convergence Zone: A Rapid Development Model for Skill Standards and Curriculum published 2005

MiraCosta Bioprocessing

- International Society of Pharmaceutical Engineers supports design, construction of 3500-sq.ft. facility - opens to classes in November 2005 with more than \$1 million in state-of-the-art equipment
- Biogen Idec, Genentech recognize MCC's dedicated, immersive environment for training and support new faculty and remodel of facility
- Materials Resource Program established for biotech companies to donate unused equipment for use in high schools

Indian Hills CC Biofuels, Agbio

- Bio-fuel laboratory techniques and fundamental scientific processes developed for teachers
- Pilot facility grows with Cargill donation of two new 80L fermenters.
- Bioreactors purchased through grant, begin to be used for training, pilot projects needed by industry
- Selected as national model for community college - industry partnerships in biotechnology by the US Dept of Education



Great Bay CC Biomanufacturing

- First in the nation Biomanufacturing Apprenticeship program begins 2005
- Jan. 31, 2005 Northeast Biopharmaceutical Manufacturing Industry Skill Standards finalized in consensus with industry
- First BIOMAN 06 national conference organized by Dr. Sonia Wallman July 24-28, 2006
- Sept. 2007 Harmonized Biopharmaceutical Manufacturing Industry Skill Standards at NBC2 working group meeting of industry and educators in Indianapolis

Forsyth Tech R&D

- Wake Forest Institute of Regenerative Medicine recruits three students for internships and "hands on experience"
- March, 2006 North Carolina Governor Michael Easley opens new technology building at Forsyth Tech, new biotechnology lab space, state-of-the-art equipment
- Ten short courses developed - delivered on campus, in the classroom, or in a biotech company lab facility

NCBW National Center for the Biotechnology Workforce

- June 28, 2004 President's High-Growth Job Training Initiative grant for Forsyth Technical CC in partnership with four other community colleges around the nation develop the National Center for the Biotechnology Workforce (NCBW)
- February, 2006 NCBW presents at symposium on Bio-processing & Biomanufacturing Training in partnership with BioNetwork NC community college biotech training system. Focus for first *Resource Line* -Tracking Trends in Biotechnology Workforce newsletter

www.biotechworkforce.org

2008 final report on first three years of NCBW (pdf)



NCBW hosts President Obama's Visit to Forsyth Tech

- December 2010 Visiting Forsyth Tech, President Barack Obama praised North Carolina's leadership in renewing American scientific education, training and skilled workforce superiority.
- April 2010 MetLife recognizes NCBW - Forsyth Tech partnership as finalist in National Community College Excellence competition, with \$20,000 award.

March 2006 NCBW team presents at League for Innovations conference in Atlanta

- April 9, 2006 Community College Program at BIO 2006 in Chicago
- July 11-13, 2006 NCBW team presents at DOL Workforce Innovations Conference, Anaheim. Honorable Mention award to NCBW.

March 2012 National Meeting with Manufacturing Institute, Bio-Link, NBC2, Medical Devices Educational Consortium, industry, college reps

June 2014 Biosciences Industry Fellowship funded by NSF-ATE, selected teachers gathered for a program with visits to NC Biosciences enterprises, producing modules for use in classrooms. [You Tube Link](#)

October 2013 Report from the Community College Program at global BIO convention in Chicago.

November 2013 TAA c3bc presentation to BIO Ohio on increasing need for workers in new, overlapping spheres of emerging technologies.

December 2013 Biosciences Talent Required - a lecture to the Triad Biotech Alliance on community college, workforce board and company partnerships working to meet industry employment needs

October 2012 NCBW at Forsyth Tech awarded a Department of Labor grant of nearly \$15 million to unite twelve high-performing colleges into a Community College Consortium for Bioscience Credentials (c3bc) to work with 45 companies, employers and shareholders to develop core, industry-recognized skill sets in bioscience. High-growth industries required clearly defined skills to keep up with increasing global competition. Working together, bioscience "industry-recognized" credentials were created.

January 2013 The Trade Adjustment Assistance Community College Career Training (TAACCCT) program c3bc launched at Biotech Place in Winston-Salem. Goals - funded by the DOL grant - are to: improve workplace training through recruitment testing, aptitude assessment, course redesigns, better outreach and more retention; introduce portable, industry-recognized credentials into training; build community college capacity for education that meets employer needs; add infrastructure and build internships. Twelve partners are concentrated into four hubs:

<h3>Learning Technologies Hub</h3> <p>Accelerate completion time through improved prior learning assessment, removal of institutional barriers and new, technology enhanced instructional materials</p> <p>Forsyth Technical Hub lead institution, pilots a modular learning lab, with assessments conducted and duplicated nationally.</p> <p>Rowan Cabarrus Alamance</p>	<h3>Lab Skills Hub</h3> <p>Develop new courses and credentials in the Biosciences with revised laboratory skills standards</p> <p>City College of San Francisco Hub lead institution, also home of the NSF national Bio-Link center, addresses lack of industry-recognized credentials, works to harmonize skill standards</p> <p>Madison Area Austin</p>
<h3>Biomanufacturing Hub</h3> <p>Develop new biomanufacturing courses, credentials and teaching materials in partnership with industry.</p> <p>Montgomery County Hub lead institution, also home of NSF biomanufacturing center NBC2, leading campaign to risk credentials and access local career paths.</p> <p>Bucks County Los Angeles Valley</p>	<h3>Medical Devices Hub</h3> <p>New skill standards; stackable, latticed credentials will help trade-impacted workers get high-wage, high-skill jobs</p> <p>Ivy Tech Hub lead institution coordinates Medical Device companies, trade organizations, community colleges and more stakeholders to develop skill set matrices in five functional areas.</p> <p>Salt Lake City St. Petersburg</p>

NCBW SciTech Ideas In Action Lecture Series:

- September 2012 Doug Drabble, Director of BioNetwork, "Career Success in Life Sciences"
- October 2012 Charles W. Calkins, Attorney and Partner Kilpatrick, Townsend & Stockton, LLP, "The Changing Landscape of Intellectual Property Protection for Biotechnology Inventions"
- November 2012 Adesanmi Ojo, M.D. "From Forsyth Tech to Medical School and Beyond" [YouTube Link](#)
- March 2013 Dr. Christy Shaffer of Hatteras Discovery spoke about "My Journey as an Entrepreneurial Scientist, CEO and Investor."
- September 2013 Dr. Eric Tomlinson, Chief Innovation Officer at Wake Forest Baptist Medical Center and President of Wake Forest University's Innovation Quarter, shared innovations and collaborations in medical devices, protein drugs and mobile apps.
- October 2013 Dr. Roger Cubicciotti, CEO of Nano-Medica, shared expertise on "Chemistry of Teams."
- January 2014 Gwyn F. Riddick, Executive Advisor for Strategic Development and Agricultural Biotechnology Consultant for the North Carolina Biotechnology Center, spoke on "A Race Against Time: How Biotechnology is Transforming Our Largest Critical Industry." [You Tube Link](#)
- February 2014 Dr. Stephen A. Hill, President and CEO of Targacept, spoke on "Biotech: Risk and Reward" [YouTube Link](#)
- March 2014 Paul Kortenaar, PhD Executive Director of SciWorks science museum spoke about "Education for Innovation: Preparing Students and Their Teachers to Work in a World of Technology Change." [You Tube Link](#)
- June 2014 Celeste Carter, National Science Foundation Program Director, spoke on funding opportunities for biotech training.
- September 2014 Forsyth Tech hosted a Fulbright Scholar from Australia - Ray Cadmore. [YouTube Link](#)
- October 2014 Dr. David McNelis from UNC Chapel Hill spoke on the issues and future of renewable energy. [YouTube Link](#)
- November 2014 Biosciences Industry Fellowship Ten participants from six states, funded by an NSF-ATE award, visited NC Bioscience colleges, labs and companies, reporting that it was "life changing," bringing new ways to teach.
- January 2015 Ana S. Iltis, Ph.D. Director, Center for Bioethics, Health and Society spoke on "Identifying, Managing and Communicating Research"
- February 2015 Anthony Atala M.D., Director, Wake Forest Institute for Regenerative Medicine presented, in conjunction with the 2015 National c3bc Meeting, a lecture on "Regenerative Medicine: Current Concepts and Changing Trends." [YouTube Link](#)
- March 2014 Forsyth Tech leads \$15M effort to build new biotech learning model. (Triad Business Journal report)
- June 2014 Community College Program at BIO PowerPoint presentation by Russ Read: Bench to Bedside shows many jobs involved in biopharmaceutical development. Plus PDF report available here: CCP@BIO_14
- March 2015 Jennifer Bryant presented "CSI In The Real World" contrasting television's investigative shows with real life hours searching, documenting, collecting and packaging any and all evidence found at a crime scene, she discussed skills required. [You Tube Link](#)
- September 2015 Barbara A. Pisani, D.O.; Professor of Cardiology, Wake Forest Baptist Medical Center discussed advanced heart health technologies: [You Tube Link](#)
- October 2015 Dr. Norma V. Quifones, Learning Consultant for Global Quality Training and Development at Biogen, shared her experiences in "My Journey from Higher Education into the Biopharmaceutical Industry." [You Tube Link](#)
- March 2015 presentation to NC Academy of Science at Wake Forest Biotech Place in Winston-Salem, NC on "Innovation in Research."
- October 21-23, 2015 Biosciences Industry Fellows Program presented at NSF ATE Principal Investigator's Meeting in Washington, DC. [You Tube Link](#)
- June 2017 Impact magazine, focuses on the Bioscience Industrial Fellowship Project.
- New partnership with NIIMBL - the National Institute for Innovation in Manufacturing Biopharmaceuticals. www.NIIMBL.us
- Skills Development Lab - special tools sharpen skills with classes for Forsyth Tech students and biotech companies' employees. High tech lab time can be rented.
- January 2018 NCBW named one of ten finalists for prestigious Bellwether Award at Community College Futures Assembly.
- June 2018 Bioscience Industrial Fellowship Project (BIFP) gathers instructors from across the U.S. for hands-on experiences in real jobs with industry partners that connect teaching to skills. [Presentations You Tube Link.](#)
- May 2018 Skills for Biomedical Emerging Technology Applications (BETA) is part of a new NSF grant awarded to NCBW to define workforce skills technicians will need for manufacturing jobs in the high-growth intersection of biomedical devices and tissue engineering. "Employers need technician-specialists who understand more," says Russ Read, NCBW ex. dir. and principal investigator. "Working together, we will define these skills."

March 26-28, 2014 DOL TAACCCT c3bc National Meeting:

- Standards by hubs reached in Skills Standards session to identify, select and draft key activities of core critical work functions common to all bioscience industries into a single document. Bio-Link has a page on skills standard work done to date - "[Finding alignment](#)"
- Gardner Carrick of NAM referred to work in skills and manufacturing in other industries at the [Manufacturing Skills Standards Council](#) web site.
- Other topics included: innovative ways to assess prior learning; strategies for Workforce Investment Boards; plus a look at the library of modular teaching "granules" being built to share through the new online NTER system.

Sept 2014 Tech Council Meeting a PowerPoint presentation by Russ Read & Michael Ayers addresses talents required for biotech jobs, including a video about alumni: [You Tube Link](#)

Dec 2014 presentation to the NCBC Piedmont Triad Biotechnology Advisory Committee, including a Learning Skills Lab video: [You Tube Link](#)

Feb 2015 new **IMPACT** magazine focuses on c3bc program **Deliverables:** upgrades in equipment, training capacity, and standards in core skills working with partners in all hubs across the nation.

February 2015 c3bc national meeting in Winston-Salem NC to grow bioscience training for Trade Adjustment Assistance displaced workers and others.

April 2015 c3bc Medical Device Hub national meeting to develop core skills for nationally-recognized, standard education pathways.

June 2015 Community College Program at BIO in Philadelphia including "Faces of Success." [CCP@BIO 15 \(PDF report\)](#)

October 12-15 2015 c3bc (TAACCCT) Annual Meeting, dedicated to common standards and increased training, held at Forsyth Tech.

Nov 2015 new **SciTech Ideas in Action** publication documents the first seven years of the Forsyth Tech professional lecture series with links to YouTube videos and other resources.

January 2016 Russ Read, NCBW Executive Director, gave this presentation at the 103 Indian Science Congress at the University of Mysore, India

March 2016 c3bc National Advisory Council Meeting in Research Triangle Park in North Carolina - "Building the Manufacturing Talent Pipeline"

June 2016 Biosciences Industry Fellowship NSF-ATE teachers program with visits to NC Biosciences enterprises.

June 2016 c3bc national meeting in San Francisco for skills standards for bioscience technicians.

June 2016 c3bc Medical Device Skills Standards published, click box for full report

June 2016 Core Skills Standards for Bioscience Technicians published by c3bc, click box for full report

June 2017 Bioscience Industrial Fellowship Presentations [You Tube Link](#)

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February 2018 Laura Deming, Director Longevity Fund, "Using Biological Research to Reduce or Reverse the Effects of Aging and Increase Longevity."

March 2018 "The Physical and Chemical Properties of Smoke" with Norman Fraley, co-lead faculty in Science of Sustainability at Wake Forest University's Sustainability Graduate program, focusing on Biomass and Bioenergy. [You Tube Link](#)

April 2018 Dr. Rohan A. Shirwaiker "3D Bioprinting = Materials + Manufacturing + Medicine." Assoc. Prof. Dept. of Industrial and Systems Engineering; Assoc. Faculty, Joint Dept. of Biomedical Engineering at North Carolina State University. Shirwaiker's team focuses on design and scalable manufacturing technologies for engineered tissues, relationships between processes and biomaterials plus effects on quality of engineered tissues. [You Tube Link](#)

September 2017 Aaron Larazus, CEO, EncepHeal Therapeutics help "Break the cycle of addiction with Next Generation Neurotherapeutics." [You Tube link](#)

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