InnovATEBIO.org

A model for ATE National Center Websites and Education Databases
Design and Architecture

**Sandra G. Porter, Ph.D. - Microbiology**
- ✓ Vision & Initial Site Design
  - 30+ Years Biotech Workforce Education Experience
  - 10+ Years Bioinformatics Company Experience
  - Built first website in 1994
  - Expert blogger, social media maven
  - Created iPad app for structural biology (Molecule World)
  - PI/Co-PI several ATE Grants

**Todd M. Smith, Ph.D - Medicinal Chemistry**
- ✓ Architecture, Design, Support
  - 30+ Years Biotech Industry Experience
  - Built and Sold a Bioinformatics Company (Geospiza, FinchTV)
  - Developing Web Enabled Systems Since 1994
  - Co-PI (Antibody Engineers), Mentoring support for Synthetic Biology, Genomics, and Structural biology companies
InnovATEBIO
A national network for biotechnology workforce education

124 College Programs

38 States

Industry Relevant Education

77 Industry advisory boards

37 Biotech degrees / certificates:

- Biotechnology
- Biomanufacturing
  Brewing Science, Medical Devices, Regulatory Affairs, Stem Cell Technology, ...

Programs Benefit Economies

787 Employers have hired InnovATEBIO students

Foster Career Paths

51 Articulation agreements with 4 yr colleges

16 High school partnerships

13 Dual credit high school partnerships

$\$ \text{ Program Funding } \$\$

NSF ATE Other

24 26 27

77 have received grant support

Data sources: InnovATEBIO.org, Biotech-Careers.org, NSF.gov
# The InnovATEBIO Community

<table>
<thead>
<tr>
<th>Entity</th>
<th>Jan 2020</th>
<th>Jun 29, 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>InnovATEBIO college programs</td>
<td>108</td>
<td>124</td>
</tr>
<tr>
<td>High School affiliates</td>
<td>76</td>
<td>91</td>
</tr>
<tr>
<td>InnovATEBIO.org members</td>
<td>773</td>
<td>1078</td>
</tr>
<tr>
<td>NSF Biotech ATE projects on InnovATEBIO.org</td>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td>Newsletter subscribers</td>
<td>1307</td>
<td>1822</td>
</tr>
<tr>
<td>LinkedIn members (industry, alumni, faculty)</td>
<td>4800</td>
<td>4928</td>
</tr>
<tr>
<td>Facebook members (biotech faculty, students)</td>
<td>786</td>
<td>967</td>
</tr>
<tr>
<td>Twitter followers</td>
<td>595</td>
<td>688</td>
</tr>
</tbody>
</table>

Data sources: InnovATEBIO.org, MailChimp, LinkedIn, Facebook, Twitter
A bit of history - 2009

Early web sites

- lots of files
- every one had to be kept up to date

index.html

about
news
events
curriculum

Modern web sites

index.php

database

about
news
events
curriculum

- fewer files
- database controls display
Building Bio-Link.org

• new abilities
  – easier to enter and capture information
  – can summarize and mine captured information
  – more flexible presentation - both in the kinds of data & ways to display information
• better support for multiple users
• different levels of permission
Change the paradigm

Reverse the flow
Empower Bio-Link programs
* Support community involvement
* The power of aggregated data
Articulate the value of community college technical programs beyond the community.
~2009 started with 8 programs

<table>
<thead>
<tr>
<th>Bio-Link Program</th>
<th>Employers</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>City College of San Francisco</td>
<td>Genentech, University of San Francisco</td>
<td>California</td>
</tr>
<tr>
<td>Solano Community College</td>
<td>Genentech, Chiron</td>
<td>California</td>
</tr>
<tr>
<td>Alamance Community College</td>
<td>Sphinx Pharmaceuticals</td>
<td>North Carolina</td>
</tr>
<tr>
<td>Portland Community College</td>
<td>Biomerieux, Genentech, Oregon Health and Science University, Precision Wire Components</td>
<td>Oregon</td>
</tr>
<tr>
<td>Austin Community College</td>
<td>The University of Texas at Austin, Stratagene/BioCrest (now Agilent)</td>
<td>Texas</td>
</tr>
<tr>
<td>Shoreline Community College</td>
<td>Amgen, Fred Hutchinson Cancer Research Center, the University of Washington</td>
<td>Washington</td>
</tr>
<tr>
<td>Madison Area Technical College</td>
<td>Marshfield Clinic, Roche, Novagen/EMD4 Biosciences, University of Wisconsin, Bone Care International (now Genzyme), Promega, PPD, Inc.</td>
<td>Wisconsin</td>
</tr>
</tbody>
</table>
InnovATEBIO employers June 2021

Data sources: InnovATEBIO.org, Biotech-Careers.org
Goal 1: The InnovATEBIO network

124 college programs: 10 Universities, 13 new

39 different biotech-related degrees / certificates, 91 programs offer biotech

91 K12 affiliates

Alabama (1)
Arizona (2)
California (22)
Colorado (2)
Connecticut (2)
Delaware (1)
Florida (9)
Georgia (5)
Hawaii (1)
Iowa (2)
Illinois (4)
Indiana (3)
Kansas (2)
Kentucky (1)
Louisiana (1)
Massachusetts (6)
Maryland (6)
Maine (1)
Michigan (1)
Minnesota (1)
Missouri (2)
Montana (1)
North Carolina (7)
Nebraska (1)
New Hampshire (1)
New Jersey (2)
New Mexico (1)
New York (7)
Ohio (4)
Oklahoma (1)
Oregon (1)
Pennsylvania (3)
Puerto Rico (2)
Rhode Island (1)
Texas (8)
Utah (1)
Virginia (2)
Washington (2)
Wisconsin (2)
Who is our audience?
Data sources: College programs, NCES, NSF

Data are aggregated, counted, presented in reports and maps

Blogs, videos, presentations

K12 partners

Advisory board

Location

Articulation

Hiring data

College navigator

Grants

Digital World Biology
Added database fields over time
Website – Database reports

Data sources: InnovATEBIO programs, NCES, NSF
Example reports

Programs' Degrees and Certificates

<table>
<thead>
<tr>
<th>Degree/Cert by term</th>
<th>Number of Programs</th>
<th>Degree#</th>
<th>Certificate#</th>
<th>Degrees and Certificate#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biotechnology</td>
<td>91</td>
<td>82</td>
<td>52</td>
<td>43</td>
</tr>
<tr>
<td>Biological Science</td>
<td>29</td>
<td>28</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Biomanufacturing</td>
<td>20</td>
<td>7</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Laboratory Assistant</td>
<td>15</td>
<td>3</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Biotechnology Research Laboratory Assistant</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Environmental Chemistry and Water Quality</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Regulatory Affairs</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

Programs with CSOs or Incubators

Data sources: InnovATEBIO programs, NSF

65%
From Bio-Link to InnovATEBIO

A Bridge to Bio-Link’s Future  DUE 1764225
How Does It Work

CMS: Content Management System

Drupal

Happy Birthday, Drupal! In its 20th year, Drupal stands above the rest as the best digital experience platform (DXP) on the web, proudly open source.

With robust content management tools, sophisticated APIs for multichannel publishing, and a track record of continuous innovation—Drupal is ready to stand as the hub of your digital presence.

General Architecture

- Content Types - organize information entities
- Fields - collect specific data in content types
- Taxonomies - organize content by terms
- Views - provide queries

Extended by Modules

- relationships, filters, UI, data export / import

Active open-source development community: modules / security

- Over 1M deployments
- Obama White House
- NSF beta.nsf.gov
- Many Universities
- Major Pharma / Biotech
- 73% of Top Media / News Companies

Common Standards

- PHP / MySQL
A model for ATE center websites

Event management & registration

- InnovATEBIO Leadership Institute
  Jun 7 2021 to Jun 17 2022
- Biomedical Emerging Technology Applications (BETA Skills)
  Jun 9 2021 to Jun 30 2021

Coordinate ATE projects

Share news

- Alumna success: Harford Community College to the DEVCOM Army Research Lab
- Core lab careers - providing the infrastructure for modern research

Recruit members & subscribers

- Sign up for news
- Follow us: Facebook, Twitter, LinkedIn

Provide curriculum

Promote programs

- Videos About the Program
- Make an Impact
- College Biotechnology Program makes a difference
- College Agriculture and Biotech Careers Program
- College Biotechnology Center of Excellence

Disseminate publications

Publications by InnovATEBIO, Bio-Link, and Members

- Redefining Biology: InnovATEBIO's Impact
- IMPACT Magazine: June 2020
- ATE Month 2020: Biomedical Emerging Technology Applications
- ATE Month 2020: Strategies for Success

Education Database
Thank you!

Websites

- InnovATEBIO.org
- Biotech-Careers.org
- DigitalWorldBiology.com

Connect with InnovATEBIO

LinkedIn: InnovATEBIO, https://www.linkedin.com/groups/2367759/

Facebook: InnovATEBIO, https://www.facebook.com/groups/biolinkorg

Twitter: @bio_link (InnovATEBIO), @digitalbio, @moleculeworld, @finchtealk

sandra@digitalworldbiology.com
todd@digitalworldbiology.com

Funding

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