PROMOTING CONCEPT-DRIVEN TEACHING STRATEGIES IN BMB THROUGH CONCEPT ASSESSMENTS

Designing Scientific Teaching Tools for BMB Education

University of San Diego, San Diego, CA
Donald P. Shiley Center for Science and Technology RM 133
Saturday, November 2, 2013

Joe Provost (University of San Diego), Ben Caldwell (Missouri Western State University), Ellis Bell (University of Richmond), Cheryl Sensibaugh (University of New Mexico)
PROJECT MISSION

By developing the BMB Concept Inventory, our goal is to broadly impact biochemistry and molecular biology education across the U.S. at the program, departmental, course and faculty levels.

Additionally, this project aims to serve as a hub to connect biochemistry and molecular biology faculty from diverse communities, institutions and backgrounds.
IMPLEMENTING VISION and CHANGE

Developing concept-driven teaching strategies in biochemistry and molecular biology

OVERVIEW NEWS MEETINGS FOUNDATIONAL CONCEPTS FOUNDATIONAL SKILLS ASSESSMENT PEOPLE CONTACT

PROJECT MISSION

The Biochemistry and Molecular Biology (BMB) Concept Inventory project is built on the concept of bringing together a large network of undergraduate faculty and researchers to develop a central, web-based Concept Inventory (a rich resource of validated assessment tools and approaches) specifically designed for biochemistry and molecular biology educators at colleges and universities. This central resource, the BMB Concept Inventory, will be a convergence of assessment tools based on the foundational concepts, discipline specific knowledge and essential skills necessary to prepare students to take on the challenges of molecular life science research in the 21st century.

By developing the BMB Concept Inventory, our goal is to broadly impact biochemistry and molecular biology education across the U.S. at the program, departmental, course and faculty levels.

Additionally, this project aims to serve as a hub to connect biochemistry and molecular biology faculty from diverse communities, institutions and backgrounds.

NEWS

Join Us at Viterbo University

October 28, 2013 – On November 9, 2013, ASBMB will host the second workshop at Viterbo University in a series of one-day workshops that will work towards refining biochemistry and molecular biology foundational concepts and skills, as well as developing an online database of instructional resources. Learn more.

2013-14 Workshop Series - Developing online BMB instructional resources

September 9, 2013 -- Starting this fall, the ASBMB will be hosting a series of one-day workshops to refine the biochemistry and molecular biology foundational concepts and skills in terms of student assessment and learning objectives, and to develop a blueprint for an online database of instructional resources. More...

SPONSORS

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Successful completion of Assessing Student Learning Series

March 8, 2013 — We have successfully wrapped-up the last of our Assessing Student Learning workshop series for 2013. We have posted workshop materials online and they can be accessed here. Future workshops will be announced this summer.

Below is a map of all the colleges and universities that have participated in the ASBMB project since 2011.
White Papers:

Foundational Concepts and Underlying Theories for Majors in “Biochemistry and Molecular Biology”

What Skills Should Students of Undergraduate Biochemistry and Molecular Biology Programs Have Upon Graduation?

Essential Concepts and Underlying Theories from Physics, Chemistry, and Mathematics for “Biochemistry and Molecular Biology” Majors
2013 Steering Committee Members

Ann Aguanno, Ph.D., Marymount Manhattan College
Cheryl Bailey, Ph.D.*, HHMI
Teaster Baird, Jr. Ph.D., San Francisco State University
Ellis Bell, Ph.D.*, University of Richmond
Marilee Benore, University of Michigan Dearborn
Ben Caldwell, Ph.D., Missouri Western State University
Jennifer Canfield, Ph.D., Simmons College
Michael Cox, Ph.D., University of Wisconsin Madison
Samantha Elliott, Ph.D., University of Maryland College Park
Kristin Fox, Ph.D., Union College
Margaret Johnson, Ph.D.*, University of Alabama
Jennifer Knight, Ph.D., University of Colorado Boulder
Debra Martin, Ph.D., St. Mary’s University of Minnesota
Carla Mattos, Ph.D.*, North Carolina State University
Pamela Mertz, Ph.D., St. Mary’s College of Maryland
JoDi Osborn, Ph.D., Georgia State University
Joe Provost, Ph.D., University of San Diego
Duane Sears, Ph.D.*, University of California, Santa Barbara
Jason Sello, Ph.D., Brown University
Cheryl Sensibaugh, Ph.D., University of New Mexico
Karen Sirum, Bowling Green State University
John Tansey, Ph.D., Otterbein University
Hal White, Ph.D.*, University of Delaware
Ann Wright, Ph.D., Canisius College
UPCOMING MEETINGS

BMB Teaching Tools - Developing assessment tools to improve student learning, Simmons College, January 11, 2014

This workshop is designed to increase participant knowledge and use of student assessment techniques around the pre identified biochemistry and molecular biology foundational concepts and skills and to actively engage participants in creating assessment tools and best practices. This workshop is open to all.

Designing Scientific Teaching Tools for BMB Education

September 10, 2013 -- Join ASBMB members and other BMB faculty for this one-day workshop at University of San Diego on Saturday, November 2, 2013. More...

BMB Teaching Tools - Developing assessment tools to improve student learning, Viterbo University, November 9, 2013

September 9, 2013 -- Join ASBMB members and other BMB faculty for a one-day workshop on the campus of Viterbo University on November 9, 2013. This workshop is designed to increase participant knowledge and use of student assessment techniques around pre-identified biochemistry and molecular biology foundational concepts and skills and to actively engage participants in creating assessment tools and best practices. More...
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Chair of Session  Kristin Fox

1. Introduction & Overview of Progress to date
   Joe Provost, University of San Diego

2. Aligning and Using Assessments in Gateway Courses
   Ellis Bell, University of Richmond

3. Best Practices: Assessing Student Centered Outcomes in Lab and Research Experiences
   Ben Caldwell, Missouri Western

4. Curriculum Alignment: Gateway to Capstone
   Duane Sears & Cheryl Bailey, UCSB and HHMI

5. Translating DBERese
   Marci Osgood, University of New Mexico
Current Working Groups

Gateway Courses
Capstone Courses
Curriculum Alignment
Toolkit Development
Planning for the Future

Want to get involved: contact:

jbell2@Richmond.edu & wzhao@asbmb.org
# Workshop Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00 AM – 10:30 AM</td>
<td><strong>Welcome</strong>&lt;br&gt;Background and context for the regional workshops will be provided, along with an orientation to roles played by the regional host, group moderators, and group members.</td>
</tr>
<tr>
<td>10:30 AM – 11:00 AM</td>
<td><strong>Activity – Decide Your Destiny</strong>&lt;br&gt;Introductions will be made and small groups of three members will be formed based upon attendees’ chosen learning objectives. Group members will self-select roles as literature searcher, electronic submitter, and verbal reporter.</td>
</tr>
<tr>
<td>11:00 AM – 11:30 AM</td>
<td><strong>Presentation – BMB Alignment Table</strong>&lt;br&gt;The principles of scientific teaching and backward design will be exemplified using one sample overall learning goal and one sample specific learning objective.</td>
</tr>
<tr>
<td>11:30 AM – 12:00 PM</td>
<td><strong>Activity – Goals and Objectives</strong>&lt;br&gt;Small groups will refine their selected overall learning goal and specific learning objective to be sufficiently explicit for purposes of designing an assessment and a learning strategy.</td>
</tr>
<tr>
<td>12:00 PM – 1:00 PM</td>
<td>Lunch</td>
</tr>
<tr>
<td>1:00 PM – 2:00 PM</td>
<td><strong>Activity – Assessments</strong>&lt;br&gt;Small groups will develop an assessment and associated scoring rubrics to measure student learning of the refined specific learning objective.</td>
</tr>
<tr>
<td>2:00 PM – 3:00 PM</td>
<td><strong>Activity – Learning Strategies</strong>&lt;br&gt;Small groups will develop a student-centered strategy to promote learning of the refined specific learning objective, in the context of either a classroom or laboratory setting.</td>
</tr>
<tr>
<td>3:00 PM – 3:15 PM</td>
<td>Break</td>
</tr>
<tr>
<td>3:15 PM – 3:30 PM</td>
<td><strong>Activity – Finalize Alignment</strong>&lt;br&gt;Small groups finalize and electronically submit their alignment tables.</td>
</tr>
<tr>
<td>3:30 PM – 4:30 PM</td>
<td><strong>Activity – Compare and Contrast</strong>&lt;br&gt;Group reporters will summarize their group’s submission. Groups will discuss the similarities and differences in their outcomes. Moderators will report out.</td>
</tr>
<tr>
<td>4:30 PM – 5:00 PM</td>
<td><strong>Activity – Reflect and Close</strong>&lt;br&gt;Time will be allowed to complete a short evaluation of the workshop, followed by an unstructured, open discussion.</td>
</tr>
<tr>
<td>TBD</td>
<td>Networking Dinner</td>
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</tbody>
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