



# Teaching Biochemistry to Students of Dentistry, Medicine, and Pharmacy: 8<sup>th</sup> International Conference of the Association of Biochemistry Educators (ABE) Virtual Conference, May 3–7, 2021

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## Introduction

Two hundred forty-eight educators and students representing 82 North American and Caribbean institutions met to discuss biochemistry and genetics education of medicine, pharmacy, and dentistry students. Plenary, Breakout, and Education Discussion Group sessions in the ABE Conference agenda and sessions organized by the Course Directors Special Interest Group of the Association of Professors of

Human and Medical Genetics as part of the ABE agenda are summarized herein.

## Opening Session and Business Meeting

- Dr. Jana Simmons (Michigan State University College of Human Medicine), ABE President, acknowledged sponsors (Wolters Kluwer Publishing, Scholar Rx, and the Association of Medical and Graduate Departments of Biochemistry (AMGDB)), introduced newly elected Board members, and thanked Karen Gottlieb (TLC Events), the ABE Executive Director. She also reviewed the organization's history, membership demographics, activities of the standing committees, and development of two new commercial partnerships with Wolters Kluwer Publishing and ScholarRx. Finally, the ABE financial report was summarized with data provided by the treasurer, Dr. Karen Symes (Boston University School of Medicine).

## Plenary Session I

- *Retrieval-Based Learning: Active Retrieval Promotes Meaningful Learning*

Dr. Jeffrey Karpicke (Purdue University) presented his work on retrieval-based learning, practicing active reconstruction of one's knowledge while studying to promote long-term learning. Methods highlighted classroom and virtual activities that incorporate retrieval practice into medical education curricula.

- *Tips for Promoting Retrieval Practice with Your Students*

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Dr. Karpicke went over practical tips for encouraging students to practice retrieval, including direct instruction about self-regulated retrieval practice and classroom methods that allow students to retrieve while learning.

- *Lessons Learned from the Age of COVID-19*

Drs. Raquel Ritchie, Martha Faner, and Carol Wilkins (Michigan State University – College of Osteopathic Medicine) presented data from their courses demonstrating similar exam performance when comparing student instruction methods (remote versus in person). The session also promoted participant discussion about COVID-19-related modifications in content delivery, summative assessments, student performance, and potential consequences of virtual learning.

## Breakout Session I

- *Pathways to Educational Leadership* Drs. Susan Cline (Mercer University School of Medicine), Kim Dahlman (Vanderbilt University Medical Center), Sheri Fong (John A. Burns School of Medicine), David Franklin (Tulane University School of Medicine), and Neil Osheroff (Vanderbilt University School of Medicine) presented potential pathways to leadership opportunities including participation in mentorship programs and involvement in curricular design. Strategies to maximize opportunities for leadership were discussed along with skills necessary based on leadership models and styles. Participants also learned about the challenges and benefits associated with educational leadership.

- *Creating a Clinical Biochemistry Thread Map Across Pre-clerkship and Clerkship Curriculum*

Drs. Jaya Yodh (Carle Illinois College of Medicine), Emine Abali (City University of New York School of Medicine), Vivek Joshi (Kentucky College of Osteopathic Medicine), Doug Spicer (University of New England College of Osteopathic Medicine), and Asma Zaidi (Kansas City University) introduced the concept of mapping clinical presentations to biochemistry concepts currently taught in medical curricula. The members of the ABE Thread Mapping Focus Group facilitated breakout groups using predesigned tables with clinical presentations to teach educators how to create concept maps for their own curriculum. The session concluded with a large group discussion on integrating biochemistry-related concepts longitudinally and vertically across medical school curricula.

- *Professional Mentoring Initiative and Education*

Drs. Trevor Creamer (University of Kentucky), David Franklin, Neil Osheroff, Amina Sadik (Touro University Nevada College of Osteopathic Medicine), and Jana Simmons comprised this panel discussion including mentors from the ABE Professional Development Committee (PDC) and their

mentees. After introductions focusing on mentor areas of expertise, mentees described how their paths of professional development were supported by their mentors. A large group discussion included differing styles of mentorship, promotion of this resource to all ABE members, the importance of diversifying the mentor group, and recruitment of new PDC mentors.

- *Update and Review Submission to ABE Question Bank*

Drs. Emine Abali, Jim Baleja (Tufts University School of Medicine), Judith Binstock (Touro College of Osteopathic Medicine), Zeynep Gromley (Lincoln Memorial University DeBusk College of Osteopathic Medicine), Pasquale Manzerra (Sanford School of Medicine, University of South Dakota), Stephen Sharkady (Campbell University), and Doug Spicer explained how to write board-style questions in an effort to revise 40 new questions for the ABE Question Bank. Participants worked in breakout rooms based on six topic categories, and each group recommended 3–5 questions to be added to the question bank after editing.

## Evening Session

- Dr. Shoumita Dasgupta (APHMG President, Boston University School of Medicine) welcomed attendees and announced session themes for the conference

- *Awards Presentation*

Dr. Jana Simmons, presented the 2021 ABE Award recipients. Recipients of the ABE Scholar Award were Dr. Sage Arbor (Marion University College of Osteopathic Medicine) and Dr. Katherine Eisenmann (University of Toledo College of Medicine). Recipient of the ABE Student award was Megha Verma (year 2 student, Touro College of Osteopathic Medicine).

- *ABE Poster Session*

Thirty-four medical education projects were presented and 5 were recognized with Poster Awards: Megha Verma, Dr. Steve Maxwell (Texas A&M College of Medicine), Dr. Tracey Weiler (Florida International University College of Medicine), Dr. John Bernstein (Stanford University School of Medicine), and Dr. Emma Vaimberg (Dept of Pediatrics, Johns Hopkins Hospital).

## Plenary Session II

- *Meeting the Challenges of Healthcare: Educating for Adaptive Expertise Through the Integration of Basic Sciences* Dr. Maria Mylopoulos (University of Toronto) described adaptive expertise as providing a framework for understanding the performance and development of experts prepared to meet the complex challenges of healthcare. She presented the need for adaptive expertise in undergraduate medical

education and the data supporting this pedagogy. Her talk focused on the importance of basic science integration and patient care in the support of adaptive expertise.

- *Educating for Adaptive Expertise: How to Align Cognition and Curricula*

Dr. Mylopoulos led a workshop where participants designed learning experiences for students that support development of adaptive expertise. Using themes from her preceding talk, participants broke into small groups and focused on integrated instruction, productive struggle, or habits on inquiry. After small group discussions, participants reported back examples and implications for teaching.

- *Association of Medical and Graduate Departments of Biochemistry (AMGDB) — Presidential Address*

Dr. Kevin Raney, president of the AMGDB, the parent organization for the ABE, and Dr. Alan Diekman (University of Arkansas School of Medicine) described the AMGDB and its mission of promoting and supporting biochemistry education, and provided an update of recent AMGDB activities. Dr. Alan Diekman then described an endeavor to implement a new 3-year medical school program in Northwest Arkansas.

- *Learning About Race in Medical School*

Dr. Clive Slaughter (Augusta University/ University of Georgia Medical Partnership) began by discussing race and diversity in a societal context and how it has often resulted in prejudice and discrimination. After defining the societal constructs of race and ethnicity, based on physical appearance and cultural heritage, respectively, he used clinical case-based examples including sickle cell disease and non-alcoholic fatty liver disease to highlight ways to incorporate race and ethnicity into medical school teaching.

## Breakout Session II

- *From Learning Objectives to Assessment of Learning: Developing a Biochemistry Question Bank for Pharmacy Educators*

Drs. Kevin Kearny (Massachusetts College of Pharmacy) and Stephen Sharkady presented 131 biochemistry learning objectives (LO)s and summarized results of a student survey on what is most needed in a pharmacy curriculum giving examples of the most frequently mentioned LOs. The most common LOs were aligned with the American College of Clinical Pharmacy Pharmacotherapy Didactic Curriculum Toolkit, and ways in which the ABE Question Bank could align with these biochemistry LOs in Schools of Pharmacy were assessed.

- *Finding the Clinical Relevance in the ABE Learning Objectives*

Drs. Emine Abali, Jim Baleja, Judith Binstock, Sheri Fong, Tracy Fulton (University of California, San Francisco),

Vivek Joshi, Pasquale Manzerra, Doug Spicer, Jaya Yodh, and Asma Zaidi led a workshop to identify the clinical relevance associated with each ABE LO. Working in breakout groups, participants mapped the ABE LOs whose information was necessary to achieve mastery of the LOs created by Aquifer™, which were designed for 3<sup>rd</sup> and 4<sup>th</sup> year students.

## Plenary Session III

- *Breaking the Mold: Transformation as a Call for Scholarly Action*

Drs. LuAnn Wilkerson and Andrew Bergemann (Dell Medical School at the University of Texas at Austin) described educational transformation as it relates to the changing health needs of communities and learning needs of students. They addressed the challenges and opportunities of scholarly transformation including reexamining how we teach based on new insights into how we learn, investigating the impact of the educational changes implemented, and enhancing our skills as adaptive leaders.

- *Getting Started as an Educational Scholar in the Health Professions: Workshop*

Drs. Wilkerson and Bergemann led a workshop that explored the ways in which skills in scientific research could be transferred to inquiries in education using social science research methods. Participants engaged in identifying an educational research question that is interesting, clear, significant, and feasible and were guided to consider the exploratory or confirmatory study design to best answer that question.

- *Are the Biomedical Sciences Really Necessary?*

Under the guidance of Dr. Bonny Dickinson, second year medical student Edwina Smith (Mercer University School of Medicine) discussed a means to apply biomedical science knowledge to patient care. A reflective writing assignment was designed to facilitate the application of knowledge which involved starting with a concrete experience to activate prior knowledge, then reflecting on how this might influence future care of patients. During a breakout session, participants practiced this approach, then shared their work and reflected on how understanding these concepts influences clinical decisions and patient care.

- *Educational Scholarship: Maximizing Your Academic Currency for Career Advancement*

Drs. Neil Osheroff, Kim Dahlman, and Tracy Fulton discussed the shift from “teacher” to “educator” through experiences gained in the educational environment. Example experiences included integration of the curriculum and creating educational resources that increase active learning and support student development toward competencies. Participants identified their strengths and improvement opportunities as educators.

● *Transform Your Best Educational Resources into Educational Scholarship*

Drs. Tameka Clemens (Meharry Medical College), Kim Dahlman, and Martha Faner led a session that described Boyer's classification and Glassik's standards of excellence in scholarship and highlighted the importance of participating in scholarship, the activities of a modern educator that can become scholarship, and the audiences and venues of dissemination. Participants reflected on a current educational activity and research question, related opportunities, needs, and challenges, and possible solutions, then split into small groups to share ideas and consult with educational scholarship facilitators, and concluded by gathering as a large group to share important discussion points.

## Plenary Session IV

● *You Can Always Get What You Want: Applying the Principles of Program Evaluation*

Drs. Kim Dahlman, Lourdes Estrada (Vanderbilt University), and Neil Osheroff discussed the importance and value of program evaluation to determine whether a program is effective at meeting the intended outcomes, strengthening the quality of the program, and providing opportunities for evidence-based quality improvements. They introduced the Logic Model, which focuses on identifying the needs of the

program, the activities involved, and the short-, medium-, and long-term expected outcomes. In breakout groups, participants chose one program and then completed a Logic Model to help participants appreciate the value of evaluating programs.

For further information about the ABE, please visit our website: <https://www.abiochemed.org/>

All the authors were members of the ABE Board of Directors.

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## Declarations

**Conflict of Interest** The authors declare no competing interests.

**Ethical Approval** NA

**Infomed Consent** NA

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