BIOGRAPHICAL SKETCH

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NAME: Lindsley, Janet Elizabeth

eRA COMMONS USER NAME (credential, e.g., agency login): JANETLINDSLEY

POSITION TITLE: Professor of Biochemistry

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Davidson College, Davidson, NC	B.S.	05/84	Chemistry
University of Wisconsin, Madison	Ph.D.	07/89	Biochemistry
Harvard University	Postdoctoral	03/93	Biochemistry

A. Personal Statement

For the past 18 years my career has been largely dedicated to the education of future physicians, including as Assistant Dean of Curriculum for the past 11 years. This has involved collaborating to design and implement the medical school curriculum. Significant accomplishments include the successful implementation of team-based learning as a major teaching modality, increased use of formative assessments in all foundational science courses, and development of a competency-based assessment and support system for medical students. Additionally, as the domain expert for metabolism and nutrition in the medical school, I have developed new methods for teaching and assessing student learning in these areas, including collaborative teaching with community health workers to bring in diverse voices of those living with metabolic diseases. I have provided steadfast support for explicitly teaching prevention of diabetes and metabolic disease in a largely pathology-focused medical curriculum, including helping to introduce Culinary Medicine to our program. At the national level, I co-led a nutrition working group within the International Association of Medical Science Educators aimed at improving physician nutrition skills and published recommended nutrition learning objectives for medical students, and participated in an NHLBI commission on Advancing Nutrition Education for Medical Students and other clinicians resulting in a 2019 white paper. I am currently leading a Best Evidence in Medical Education (BEME) international project on the role of basic science in physician profession identity formation and serve as lead biochemistry editor for the Aquifer Sciences Integrated Illness Script project.

For the past 15 years I have supported the diabetes and metabolism research community by teaching a graduate course on metabolic regulation. What began as an 8-student class now has a typical enrollment of 25-30, and includes nutrition students, medical students, molecular biology and biological chemistry graduate students. After spending the past two decades learning about effective curriculum design, I now also mentor a team of biomedical postdocs in developing and teaching a new advanced undergraduate biology course each year. I am currently developing a new Foundations of Molecular Biology course as part of our updated graduate student curriculum set to launch in August 2022.

B. Positions and Honors

Positions and Employment

1992 - 1993 Visiting Scholar, Institut de Biologie Moleculaire et Cellulaire du CNRS, Université Louis Pasteur, Strasbourg, France,

1993 - 2000	Assistant Professor, University of Utah School of Medicine, Department of Biochemistry, Salt Lake City, UT
2000 - 2017	Associate Professor, University of Utah School of Medicine, Department of Biochemistry, Salt Lake City, UT
2003 - 2007	Associate Director of the Core Resources, University of Utah School of Medicine, Salt Lake City, UT
2008 - 2011	Director, Medical School Curriculum, University of Utah School of Medicine, Salt Lake City, UT
2010 - Present	Assistant Dean for Curriculum, School of Medicine, University of Utah School of Medicine, Salt Lake City, UT
2017- Present	Professor, University of Utah School of Medicine, Department of Biochemistry, Salt Lake City, UT
2016 – Present	Adjunct Professor of Nutrition and Integrative Physiology

Other Experience and Professional Memberships

2004-2008	National Board of Medical Examiners Step 1 Item Writing Committee
2009 – Present	National Board of Medical Examiners Step 1 Review Committee
2008 - Present	Association of Biochemistry Educators (Chair 2009-10)
2009 – Present	International Association of Medical Science Educators
2013 – Present	Academy of Health Science Educators, University of Utah (Fellow)
2016- Present	Team Based Learning Collaborative
2016- Present	American Medical Association Accelerating Change in Education Consortium
2016 – Present	American Medical Association Master Adaptive Learner working group
2016- 2019	National Board of Medical Examiners Metabolic Map Committee
2021-Present	Aquifer Sciences Biochemistry lead editor

Honors

2007	Gender Equity Award
2010	University Distinguished Teaching Award
2016	Leonard W. Jarcho, MD, Distinguished Teaching Award

C. Contributions to Science

My early publications describe the work that my research laboratory did to understand the mechanisms of enzymes that utilize ATP and alter DNA structure. We were the first to discover the unexpected asymmetry in the reaction mechanism of the type II topoisomerases. During the past 17 years I have been focused on improving the education of our medical and graduate students. This has included improved methods for teaching and assessing student learning of science. For the past seven years I have been leading a national effort to change the focus of medical biochemistry education from the rote memorization of metabolic pathways to an integrated understanding of metabolism and molecular biology/physiology. I have initiated collaboration between the Association of Biochemistry Educators (where I served as the organization's first chair) and the National Board of Medical Examiners (NBME) to create a national, medically relevant metabolic map that will be available on all medical licensing exams in the near future. This major advance was possible because of my longstanding work with the NBME, first as a member of the step 1 test development committee (2004 – 2008) and currently as a member of the Interdisciplinary Review Committee (2009-present; one of only two biochemists nationally). I co-lead a sub-group of the International Association of Medical Science Educators (IAMSE) to develop scientifically sound and clinically relevant educational guidelines for nutrition.

a. Fulton TB, Ronner P, **Lindsley JE** (2012). Medical Biochemistry in the Era of Competencies: Is it Time for the Krebs Cycle to go? *Medical Science Educator*, *22*, 29-32.
b. Sabina R, Uhley V, Main B, Lucia V, **Lindsley JE**, Pippitt K, Morton D, Twining S, Havas N (2014). Blood Glucose Laboratory: Collective Experiences at Three US Medical Schools. Available from:

https://www.mededportal.org/ publication/9978 http://dx.doi.org/10.15766/mep_2374-8265.9978. *MedEdPORTAL Publications*.

c. **Lindsley, JE**, Morton, DA, Pippitt, K, Lamb, S, Colbert-Getz, JM (2016). The Two-Stage Examination: A Method to Assess Individual Competence and Collaborative Problem Solving in Medical Students. *Academic Medicine*, 91 (10) 1384-87.
d. Colbert-Getz JM, Baumann S, Shaffer K, Lamb S, **Lindsley JE**, Rainey R, Randall K, Roussel D, Stevenson A, Cianciolo AT, Maines T, O'Brien B, Westerman M. What's in a Transition? An Integrative Perspective on Transitions in Medical Education. *Teach Learn Med*. 2016;28(4):347-352. doi:10.1080/10401334.2016.1217226
e. **Lindsley, JE**, Abali, EE, Bikman, BT, Cline, SD, Fulton, T, Lopez, B, Rosenthal, OD, Uhley, VE, Weintraut, RJ, Williams, DP, Wisco, JJ, Thompson, K (2017) What nutrition-related knowledge, skills and attitudes should medical students develop? *Medical Science Educator*, 27: 579-583
f. Spicer DB, Thompson KH, Song MS, Cowan TM, Fulton TB, **Lindsley, JE** (2019) Medical Biochemistry Without Rote Memorization: Multi-Institution Implementation and Student Perceptions of a Nationally Standardized Metabolic Map for Learning and Assessment. *Medical Science Educator,* 29: 87-92.
g. Van Horn L, Lenders CM, Pratt CA, Beech B, Carney PA, Dietz W, DiMaria-Ghalili R, Harlan T, Hash R, Kohlmeier M, Kolasa K, Krebs NF, Kushner RF, Lieh-Lai M, **Lindsley J**, Meacham S, Nicastro H, Nowson C, Palmer C, Paniagua M, Philips E, Ray S, Rose S, Salive M, Schofield M, Thompson K, Trilk JL, Twillman G, White JD, Zappalà G, Vargas A, Lynch C. Advancing Nutrition Education, Training, and Research for Medical Students, Residents, Fellows, Attending Physicians, and Other Clinicians: Building Competencies and Interdisciplinary Coordination. Adv Nutr. 2019 Nov 1;10(6):1181-1200. doi: 10.1093/advances/nmz083. PMID: 31728505; PMCID: PMC6855992.
h. Lamb, S., Chow, C., **Lindsley, J.** *et al.* Learning from failure: how eliminating required attendance sparked the beginning of a medical school transformation. *Perspect Med Educ* (2020). https://doi.org/10.1007/s40037-020-00615-y
i. Crawford, A., Blitch, A., **Lindsley, J.E**., Dickerson, T.T. (2020) Embracing Uncertainty: COVID-19 exploration in real time. Med Educ; 54(11):1052-1053. doi: 10.1111/medu.14320
j. Carmody JB, Green LM, Kiger PG, Baxter JD, Cassese T, Fancher TL, George P, Griffin EJ, Haywood YC, Henderson D, Hueppchen NA, Karras DJ, Leep Hunderfund AN, **Lindsley JE**, McGuire PG, Meholli M, Miller CS, Monrad SU, Nelson KL, Olson KA, Pahwa AK, Starr SR, Tunkel AR, Van Eck RN, Youm JH, Ziring DJ, Rajasekaran SK. Medical Student Attitudes toward USMLE Step 1 and Health Systems Science - A Multi-Institutional Survey. Teach Learn Med. 2021 Apr-May;33(2):139-153. doi: 10.1080/10401334.2020.1825962. Epub 2020 Dec 8. PMID: 33289589.
k. Luman A, Lamb SM, Stevenson A, **Lindsley JE**. Students as catalysts for change: Building bridges, improving culture. Med Educ. 2021 Nov;55(11):1312-1313. doi: 10.1111/medu.14610. Epub 2021 Aug 21. PMID: 34418131.
l. Pippitt, K.A., Moore, K.B., **Lindsley, J.E.** *et al.* Assessment for Learning with Ungraded and Graded Assessments. *Med.Sci.Educ.* (2022). https://doi.org/10.1007/s40670-022-01612-y
m. Colbert-Getz, JM.; **Lindsley, JE**; Moore, KB; Formosa, T; Pippitt, K. Promotion of a Mastery Orientation to Learning in Medical School: Implementation of the Not Yet Pass Grade. Academic Medicine: September 27, 2022 - Volume - Issue - 10.1097/ACM.0000000000005002

In 2018-19, I lead a team of faculty and medical students with the non-profit Aquifer Sciences to develop a series of Integrated Illness Scripts and Mechanism of Disease maps that link clinical features for common diseases to the basic science mechanisms. Beginning in 2021, I have served as biochemistry editor and lead biochemistry editor since September, 2021.

a. Nixon J, Sheridan L (Lead Editors); Aronson, J, Grimes K, **Lindsley J**, Lufler R, Lyons V, Nguyen S (student), Zinkhan G (Contributing Authors in alphabetical order). *Aquifer Sciences Integrated Illness Scripts: Appendicitis.* Fall LH and Wilson-Delfosse AL, eds. www.aquifer.org.
b. Harris D, Ngo K (Lead Editors); Bernstein J, Cline S, Croniger C, Dickinson B, Farr R, Grimes K, Kerry J, **Lindsley J**, Poznanski A, Stehouwer N, Sturtevant J, Yoest J (Contributing Authors in alphabetical order). *Aquifer Sciences Integrated Illness Scripts: Crohn Disease.* Fall LH and Wilson-Delfosse AL, eds. www.aquifer.org.
c. English R, Fulton T (Lead Editors); Cho Y, Dell M, Ferguson H, Heinrich C (student), **Lindsley J**, Nerness R (student), Ngo K, Rogstad D, Sturtevant J (Contributing Authors in alphabetical order). *Aquifer Sciences Integrated Illness Scripts: Jaundice - ABO Hemolytic Disease of a Newborn.* Fall LH and Wilson-Delfosse AL, eds. www.aquifer.org.
d. English R, Fulton T (Lead Editors); Carroll R, Kahler G (student), **Lindsley J**, Ngo K, Rogstad D (Contributing Authors in alphabetical order). *Aquifer Sciences Integrated Illness Scripts: Jaundice - Breastfeeding.* Fall LH and Wilson-Delfosse AL, eds. www.aquifer.org.
e. English R, Fulton T (Lead Editors); Bernstein J, Cicilioni K, **Lindsley J**, Meyer M (student), Ngo K, Rogstad D (Contributing Authors in alphabetical order). *Aquifer Sciences Integrated Illness Scripts: Jaundice - Physiologic.* Fall LH and Wilson-Delfosse AL, eds. www.aquifer.org.
f. Gallman E, Xiong W (Lead Editors); Aronson J, Hannon P, Kapadia N (student), **Lindsley J**, Metzstein M (Contributing Authors in alphabetical order). *Aquifer Sciences Integrated Illness Scripts: Stroke - Hemorrhagic (Intracerebral - Left Putamen).* Fall LH and Wilson-Delfosse AL, eds. www.aquifer.org.
g. Gallman E, Xiong W (Lead Editors); Aronson J, Hannon P, **Lindsley J**, Metzstein M, Sattler L (Contributing Authors in alphabetical order). *Aquifer Sciences Integrated Illness Scripts: Stroke - Ischemic (Left Middle Cerebral Artery)*. Fall LH and Wilson-Delfosse AL, eds. www.aquifer.org. Accessed
h. Gallman E, Xiong W (Lead Editors); Aronson J, Harris D, Hannon P, **Lindsley J**, Metzstein M, Sattler L (Contributing Authors in alphabetical order). Aquifer Sciences Integrated Illness Scripts: *Transient Ischemic Attack (Left Middle Cerebral Artery)*. Fall LH and Wilson-Delfosse AL, eds. www.aquifer.org.
i. Harris D, Ngo K (Lead Editors); Aronson J, Bernstein J, Croniger C, Hughes R, Kerry J, **Lindsley J**, Makkar N (student), Sturtevant J, Yoest J (Contributing Authors in alphabetical order). *Aquifer Sciences Integrated Illness Scripts: Ulcerative Colitis.* Fall LH and Wilson-Delfosse AL, eds. www.aquifer.org.

Beginning in spring of 2018, I have worked each year of a team of 2-4 postdocs from several different departments within Health Sciences to design and teach a new, 5000-level summer course in the Biology department. This successful collaboration has resulted in the Utah Postdoc Curriculum and Teaching (UP-CAT) program: https://medicine.utah.edu/up-cat/

a. Nuebel, E., Nowinski, S.M., Hemmis, C.W. , **Lindsley, J.E**. A Curriculum Design and Teaching Experience Created by and for Bioscience Postdoctoral Fellows in a Medical School. *Med.Sci.Educ.* **30,** 97–101 (2020). https://doi.org/10.1007/s40670-019-00889-w

D.

Completed Research Support

01/31/20 – 10/31/21 **1U4U**
Building a branch from UPSTEM to the HSC: co-creating infrastructure and skills to increase student diversity and success in our health professional schools
PI
Direct and total costs: $15,000

08/01/18-04/01/19 Aquifer Sciences
Foundational Science Lead educator/PI
Direct and total costs: $1500
Development of Integrated Illness Scripts

01/01/16 - 08/31/18 AMA Consortium
Principal Investigator(s): Sara M. Lamb; Janet E. Lindsley
Direct Costs: $75,000 Total Costs: $75,000
American Medical Association Fdtn
Role: Co-Principal Investigator

RO1 GM51194 Lindsley (PI) 08/01/95-07/31/04
Mechanisms of Energy Coupling by DNA Topoisomerase II
The goals of this project were to determine how type 2 DNA topoisomerases utilize ATP to transport one duplex of DNA through a transient break in another.
Role: PI

R21 GM60420 Lindsley (PI) 01/01/00-12/31/04
A Novel Genetic Selection for Chromosome Translocations
The goal of this project was to develop an assay in yeast to study chromosome translocation and study DNA sequences that are frequently found at translocation breakpoints in patients with leukemia.
Role: PI