

JACOB J. ADLER

Ph.D.

(he/him)

Assistant Professor of Practice

Department of Biological Sciences

Purdue University, West Lafayette, IN 47907

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EDUCATION:

- Ph.D. Indiana University, Indianapolis, IN, Biochemistry and Molecular Biology,
Thesis: The Inhibition of Mammary Epithelial Cell Growth by the Long Isoform of Angiotensin II
B.S. Purdue University, West Lafayette, IN, Biochemistry (summa cum laude)

POSITIONS:

- 2023-Present Assistant Professor of Practice, Purdue University, West Lafayette, IN
Designing and facilitating Introductory Biology Laboratory using equitable pedagogy. Experiences
Developing education-based research in Course-based Undergraduate Research Experiences (CUREs) and their long-term impact on alumni.
Developing education-based research in alternative grading strategies and their impact on student self-determination and motivation.
- 2019-2023 Associate Professor of Biology, Brescia University, Owensboro, KY
Designed and facilitated courses using active learning, inclusive pedagogy, and equitable assessment in Introductory Cellular and Molecular Biology with Laboratory, Genetics with Laboratory, Biochemistry with Laboratory, Advanced Cell Biology with Laboratory, Cancer Biology with Laboratory, Interdisciplinary Senior Seminar to undergraduate science majors, and Introductory Nutrition and Introductory Biology (on-ground and online) to undergraduate non-majors.
Developed education-based research in assessment of STEM courses.
Developed, implemented, and assessed STEM Course-based Undergraduate Research Experiences (CUREs).
Developed, implemented, and assessed High-Impact Practices within STEM disciplines.
Coordinated assessment and programmatic development for three academic programs: Biochemistry, Medical Laboratory Science, and Brescia University's General Education Core Curriculum.
- 2014-2019 Assistant Professor of Biology, Brescia University, Owensboro, KY
- 2014 Adjunct Professor of Biology, Ivy Tech Community College, Indianapolis, IN
Instructed two sections of Introductory Biology with Laboratory to undergraduate non-majors.
- 2011-2013 National Science Foundation GK-12 Fellow, Indiana University-Purdue University Indianapolis
Instructed 15 hours weekly in Biomedical Project Lead the Way, Advanced Placement Biology, and Introductory Biology courses at two city high schools. Mentored over 50 individual student's research projects for scientific inquiry. (NSF GK-12 Fellowship Grant Recipient)

ACHIEVEMENTS (selected):

- 2023 Deep Teaching Residency Scholar
- 2023 President's Award for Teaching Innovation 2023. Finalist. Brescia University
- 2021 President's Award for Teaching Innovation 2021. Finalist. Brescia University
- 2020 Data in Introductory Biological Sciences Scholar QUBES 2020
- 2018 President's Award for Teaching Innovation 2018. Recipient. Brescia University
- 2016 President's Award for Teaching Innovation 2016. Finalist. Brescia University
- 2015-2016 Biology Scholar in Assessment, American Society for Microbiology (ASM)
- 2015 Mentoring in Active Learning and Teaching (MALT) Mentee, American Society for Cell Biology (ASCB)
- 2014 Co-organizer of the ASCB Midwest Membrane Trafficking and Signaling Symposium, Louisville, KY with total sponsored funding, \$3000, with \$1500 from ASCB grant.

PUBLICATIONS:

DISCIPLINE-BASED EDUCATION RESEARCH PUBLICATIONS:

Jacob J. Adler, (2023) Fatty Acid Induction of Lipid Droplets in Cancer Cells, *CourseSource*, 10, <https://doi.org/10.24918/cs.2023.19>

Sabel JL, Wright K, Jacob J. Adler, Bates G, Bates L, Pandey S, Simons AM, Swerdlow SJ, Reyna NS, and Hensley L, (2021) Transitioning Cell Culture CURE Labs from Campus to Online: Novel Strategies for a Novel Time, *Journal of Microbiology and Biology Education*, Vol. 22, 1.

Jacob J. Adler, (2018) Students 'Tackle' Quantitative Literacy in their Science Communication with Real-world Football Activity, *Journal of Microbiology and Biology Education*, Vol. 19, 1.

Kleinschmit A, Jacob J. Adler, Massimelli J, and Vrentas C, (2018) Riboflavin Riboswitch Regulation: Hands-on Learning about the Role of RNA Structures in the Control of Gene Expression in Bacteria, *Journal of Microbiology and Biology Education*, Vol. 19, 2.

Jacob J. Adler, Judd MV, Bringman LR, Wells CD and Marrs KA (2013) Day as a Pathologist: Utilization of Technology to Guide Students in Exploring Careers in Breast Cancer Pathology, *The American Biology Teacher*, Vol. 75, 8: 559-565.

COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCE PUBLICATIONS:

Eichholz ME, Ballou MJ, Haight TJ, Minton JL, Oates RN, and Jacob J. Adler (2021) Effect of HER2 Expression on NUPL2 Protein in Cervical Cancer Cells, *Kentucky Journal of Undergraduate Scholarship*, Vol. 5, 1.

Beams WA, Burelos EL, Dame LR, Hundley CC, Sims LG, and Jacob J. Adler (2017) *Rosa hybrid* Gene *GAPC* is Mutated in the Presence of the Rose Rosette Virus, *Kentucky Journal of Undergraduate Scholarship*, Vol. 1, 1:121-131.

Beams WA, Burelos EL, Dame LR, Hundley CC, Sims LG, and Jacob J. Adler (2016) Accession Gene Sequences from the study: Rose Rosette Virus Mutates the Plant Gene *GAPC* in *Rosa hybrid*, *National Center for Biotechnology Information (GenBank)*, Accession Numbers: KT806117 and KT806118.

BIOLOGY RESEARCH PUBLICATIONS:

Jacob J. Adler and Edge P. (2023) Fatty Acid Induction of Lipid Droplet Formation in HeLa Cells (In Preparation).

Jacob J. Adler, Johnson DE, Heller BL, Bringman LR, Ranahan WP, Conwell MD, Yang S, Hudmon A and Wells CD (2013) Serum Deprivation Inhibits the Transcriptional Co-Activator YAP and Cell Growth via Phosphorylation of the 130-kDa Isoform of Angiomotin by the LATS1/2 Protein Kinases, *Proceedings of the National Academy of Sciences*, Vol. 110, 43: 17368-17373.

F1000Prime Recommendation: Pan D and Zheng Y: of [Adler JJ et al., Proc Natl Acad Sci U S A 2013, 110(43):17368-73]. In F1000Prime, 13 Jan 2014.

Jacob J. Adler, Heller BL, Bringman LR, Ranahan WP, Cocklin RR, Goebel MG, Oh M, Lim H, Ingham RJ and Wells CD (2013) Amot130 Adapts Atrophin-1 Interacting Protein 4 to Inhibit Yes-associated Protein signaling and Cell Growth, *Journal of Biological Chemistry*, Vol. 288, 25: 15181-15193.

Galan JA, Paris LL, Zhang H, Jacob J. Adler, Geahlen RL and Tao WA (2011) Proteomic Studies of Syk-Interacting Proteins Using a Novel Amine-Specific Isotope Tag and GFP Nanotrap, *Journal of The American Society for Mass Spectrometry*, Vol. 22, 319-328.

PROFESSIONAL PRESENTATIONS: (selected, *abstract publication)

DISCIPLINE-BASED EDUCATION RESEARCH PRESENTATIONS:

Jacob J. Adler, Talk: “Student Perceptions of Alternative Grading Strategies in the Biology Classroom” (2023) The Grading Conference, Online.*

Jacob J. Adler, Poster: “Students Perceptions of Ungrading Strategies in the Biology Classroom” (2022) The Society for Advancement of Biology Education Research Annual Conference, Minneapolis, MN.* (Promoting Active Learning Mentoring PALM Travel Grant Recipient)

Jacob J. Adler, Roundtable Talk: “Sloganing: A Structured Activity to Help Students Recall Science Article Content” (2019) The Society for Advancement of Biology Education Research Annual Conference, Minneapolis, MN.* (Travel Grant Recipient)

Jacob J. Adler, Workshop: “Shifting Responsibility for Project-based Learning onto Your Students by Effectively Using Rubrics” (2017) Brescia University Faculty Fall Institute, Owensboro, KY.

Kleinschmit A, Jacob J. Adler, Massimelli J, and Vrentas C, Poster: “Assessment of a Model-based Riboswitch Activity for Instruction on Microbial Gene Regulation” (2017) 24th Annual ASM Conference for Undergraduate Educators (ASMCUE), Denver, CO.*

Kleinschmit A, Jacob J. Adler, Massimelli J, and Vrentas C, Informal Workshop: “A Model-based Riboswitch Activity for Instruction on Microbial Gene Regulation” (2017) 24th Annual ASM Conference for Undergraduate Educators (ASMCUE), Denver, CO.

Jacob J. Adler, Informal Workshop: “Scaffolding of Structured Assessments to Help Students Engage in the Central Dogma of Molecular Biology” (2016) 23rd Annual ASM Conference for Undergraduate

Educators (ASMCUE), North Bethesda, MD. (Title III Strengthening Institutions Program Travel Grant Recipient)

Jacob J. Adler, Poster: “Students ‘Tackle’ Biology Problem Solving Skills With Real-world Football Activity” (2016) 23rd Annual ASM Conference for Undergraduate Educators (ASMCUE), North Bethesda, MD.* (F.M. Hart Endowment Travel Grant Recipient)

Wolyniak MJ, Prunuske AJ, Jacob J. Adler, Crowe AJ, Keller LC, Kolber BJ, Leland BA, Murugesan S, Schreiner SM, Whatley Z, Wick SM, Poster: “Spreading *Vision and Change* through faculty mentorship: The ASCB Mentoring in Active Learning and Teaching (MALT) program” (2015) ASCB Annual Meeting, San Diego, CA*

Jacob J. Adler, McAdams A.J., Judd MV, and Marrs KA, Poster: “Research in the Classroom: The Art of Bringing Experts into Your Classroom” (2013) Edward C. Moore Symposium on Excellence in Teaching, Indianapolis, IN and Indiana University-Purdue University Indianapolis Research Day, Indianapolis, IN*

Jacob J. Adler and Palacio L, Workshop: “Scientists in the classroom: A driving force in project centered courses” (2013) International Teacher-Scientist Partnership Conference AAAS, Boston, MA*

Jacob J. Adler, Carpenter M, Manning K and Meissner D, Poster: “IUPUI GK-12 Urban Educators Program” (2013) AAAS Annual Meeting, Boston, MA*

Jacob J. Adler, Cooper GL, Judd MV, Wells CD and Marrs KA, Poster: “Breast cancer analysis in the advanced placement biology classroom” (2012) 60th NSTA National Conference on Science Education, Indianapolis, IN*

Judd MV, Jacob J. Adler and Marrs KA, Workshop: “Thinking like a scientist: Lessons learned in the NSF-funded K-12 experience” (2012) 60th NSTA National Conference on Science Education, Indianapolis, IN*

Judd MV, Jacob J. Adler, Cooper GL and Marrs KA, Workshop: “The power of the pair: Taking an innovative approach to optimizing mentorship through creating strong GK-12 partners” (2012) National Science Foundation Graduate STEM Fellows in K-12 Education Annual Conference, Washington D.C.*

Jacob J. Adler, Cooper GL, Judd MV, Wells CD and Marrs KA, Poster: “Breast cancer analysis in the advanced placement biology classroom” (2012) Indiana University-Purdue University Indianapolis Research Day, Indianapolis, IN*

COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCE PRESENTATIONS:

Ballou M, Eichholz M, Haight T, Minton J, Oates R, and Jacob J. Adler, Poster: “Effect of HER2 expression on NUPL2 protein in cervical cancer cells” (2018) American Society of Cell Biology Annual Meeting, San Diego, CA* (American Society for Cell Biology (ASCB) Annual Meeting travel award recipient)

Beams W, Burelos E, Dame L, Hundley C, Sims L, and Jacob J. Adler, Poster: “Understanding the mechanisms of cellular growth control with the Rose Rosette Virus in plants” (2014) American Society of Cell Biology Annual Meeting, Philadelphia, PA* (American Society for Cell Biology (ASCB) Annual Meeting travel award recipient)

SERVICE:

2022-Present *Journal of Microbiology and Biology Education* Reviewer

2021-Present General Education Program Revitalization Task Force for Brescia University

2020 Coordinator of the Introductory Biology Quality Enhancement Plan on Critical Thinking

2020-2021 Co-coordinator of the Biology Program for Brescia University

2020-2021 & 2016 Advanced Placement Biology Exam Reader

2019-Present Spirit of Angela Award Committee (Chair) for Brescia University

2019-Present & 2015-2017 Institutional Review Board for Brescia University (Vice Chair 2022-Present)

2018-Present Educational Outcomes and Assessment Committee for Brescia University

2018 Coordinator of Biology Title III Strengthening Institutions Program Grant. Total budget \$41000.

2018 F.M. Hart Grant to Research Impact of Biology Student Professional Development on Career Outcomes, IRB Approval May 2018.

2018 Piloted the Introductory Nutrition Signature Assignment for Brescia University Bio 112 sections

2017-2018 Piloted the Introductory Biology Signature Assignment for Brescia University Bio 100 sections

2017-2019 Faculty Welfare Committee for Brescia University

2016-Present Coordinator of the Annual Math and Science Holiday Party for Brescia University

2016-Present Coordinator of the Medical Laboratory Science Program for Brescia University

2016-Present Coordinator of the Biochemistry Program for Brescia University

2016-Present Coordinator of the General Education Program for Brescia University

2016-Present Institutional Advancement Committee for Brescia University

2016 Kentucky Academy of Science (KAS) Discovery Festival Presenter, Outreach

2016-Present Assessment Task Force Committee for Brescia University

2016-2018 Executive Committee for Brescia University

2016-Present Host of Professional Development Talk Series for Biology Majors at Brescia University

2016 Chemistry Faculty Search Committee for Brescia University

2015-2018 American Cancer Society Making Strides Against Breast Cancer walk co-organizer and Breakfast Kick-off coordinator, KY

2015-Present CV Reviewer for ASCB

2015-Present *CourseSource* Reviewer

2015-2019 Safety Committee for Brescia University

2015 Poster Judge - ASCB Midwest Membrane Trafficking and Signaling Symposium, Louisville, KY

2015 Biology Faculty Search Committee for Brescia University

2015-Present Honors Convocation Judge and Mentor for Brescia University

2015-2018 Work Study Supervisor Division of Mathematics and Natural Science Brescia University

2015 Invited and Hosted Guest Lecturer Lorraine Lauter for Brescia University

2014-Present Student Academic and Career Adviser for Brescia University

2014 *Bioscene: Journal of College Biology Teaching* Ad Hoc Reviewer

HIGH IMPACT PRACTICES:

NUTRITION YOGA EXPERIENCE:

2018-2020 Title III Strengthening Institutions Program High Impact Practice Grant Recipient for Nutrition Special Project

CELL BIOLOGY COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCES:

- 2023 “PLIN1 and PLIN2 Expression During Lipid Droplet Formation in the Presence of Alpha- or Gamma-Linolenic Acids.”
- 2023 “PLIN1 and PLIN2 Gene Expression During Lipid Droplet Accumulation in HeLa Cells by Stearic and Gamma-Linolenic Acids”
- 2022 “Effect of Tamoxifen and Fulvestrant on Estrogen-Receptor-Negative HeLa Cell Growth.” Brescia University Celebration of Excellence, Owensboro, KY
- 2022 “Comparison of the Area of Lipid Droplets Produced by Isomers Alpha- and Gamma-Linolenic Acid in HeLa Cells” Brescia University Celebration of Excellence, 1st Place Group Oral Presentation Division, Owensboro, KY
- 2022 “Effect of Docosahexaenoic acid on lipid droplet formation in HeLa cells” Brescia University Celebration of Excellence, Owensboro, KY
- 2020 “Effects of Phosphatidic Acid on Lipid Droplet Formation and Cell Survival”
- 2020 “Effect of Trans-10 Cis-12 Linoleic Acid on Lipid Droplet Formation and Cell Death in Cervical Cancer Cells”
- 2020 National Science Foundation Research Grant via The Cell Biology Education Consortium (RCN-UBE #1827066) for Introductory Cellular and Molecular Biology Course-based Undergraduate Research Experience (CURE)
- 2019 “Effects of Insulin on Lipid Droplet Formation in Cervical Cancer Cells”
- 2019 National Science Foundation Research Grant via The Cell Biology Education Consortium (RCN-UBE #1827066) for Introductory Cellular and Molecular Biology Course-based Undergraduate Research Experience (CURE)
- 2017-2019 “Effect of HER2 expression on NUPL2 protein in cervical cancer cells” Brescia University Celebration of Excellence, Owensboro, KY & American Society for Cell Biology Annual Meeting, San Diego, CA
- 2017 “Effects of methyl-alpha-glucopyranose on apoptotic and autophagy signaling in HeLa cells” & “Effects of Ellagic Acid on PKC-Delta signaling in HeLa cells”
- 2016 Title III Strengthening Institutions Program High Impact Practice Grant Recipient for Introductory Cellular and Molecular Biology Course-based Undergraduate Research Experience (CURE)
- 2016 “The Impact of Ammonium Salts on Cellular Autophagy.” Brescia University Celebration of Excellence, Owensboro, KY

SYNTHETIC BIOLOGY COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCES:

- 2021 “Monitoring the Effect of Temperature on the Novel BioBrick Heat Shock Protein Promoter Expression Vector in *E. coli*.” and “Monitoring Relative Methylmercury Levels in Packaged and Preserved Tuna using the Novel BioBrick Expression Vector in *E. coli*.”
- 2019 “PTAC Promoter Activity Measured via GFP Fluorescence”
- 2019 Arkansas CURE (AR-CURE) Travel Grant Recipient to attend AR-CURE Workshop in Synthetic Biology Laboratory Science

BIOINFORMATICS COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCES:

- 2021 “HLA Class I Gene Alteration and Patient Survival with Skin Melanomas” Cell Biology Education Consortium Twitter Conference

- 2021 “Albinism Gene Alteration and Patient Survival with Skin Cancers” Cell Biology Education Consortium Twitter Conference
- 2021 “LRP5 & LRP6 Gene Expression and Patient Survival Analysis in Digestive Cancers” Cell Biology Education Consortium Twitter Conference
- 2021 “TSC1/2 Gene Expression Relationship between Epilepsy and Glioblastoma Cancer” Cell Biology Education Consortium Twitter Conference
- 2021 “Relationship between general vitiligo’s regulated genes and skin cancer” Brescia University Celebration of Excellence, 1st Place Group Oral Presentation Division, Owensboro, KY
- 2021 “Examining the similarities between ulcerative colitis and digestive system cancers via gene expression” Brescia University Celebration of Excellence, Owensboro, KY

BIOCHEMISTRY GENOTYPING COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCES:

- 2022 “An Exploration of Susceptibility to Musculoskeletal Soft Tissue Injuries Among College Student Athletes Using a Single Nucleotide Polymorphism in COL5A1.
- 2022 “Correlation of variants of ACTN3 in student athletes and physical performance.”
- 2020 “Analyzing the linkage between ACE2 Gene and COVID-19 in College Students”
- 2020 “TMPRSS2 Gene and its Connection to COVID-19 in College Students”
- 2018 “Analysis of Alcohol Dependence Risk Factors in College-Aged Adults via Examination of ADH1C Single Nucleotide Polymorphism”

BIOCHEMISTRY COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCES:

- 2017 “Expression analysis of metabolic and senescence genes in *Rosa hybrid* infected with Rose Rosette Virus.” Brescia University Celebration of Excellence, Owensboro, KY
- 2016 “Expression analysis of metabolic and senescence genes in *Rosa hybrid* infected with Rose Rosette Virus.” Kentucky Academy of Science Annual Meeting, 1st Place Poster Botany Division, Louisville, KY (Title III Strengthening Institutions Program High Impact Practice Grant Recipient for Travel to Kentucky Academy of Science Annual Meeting with Students)
- 2016 “Synthesis and Structure Activity Relationship of Isoniazid Derivatives.” Brescia University Celebration of Excellence, 1st Place Poster Division, Owensboro, KY
- 2016 “Altered Transcriptional Growth Control Signaling in *Rosa hybrid* Infected with the Rose Rosette Virus” (Kentucky Academy of Science (KAS) Botany Research Grant Recipient)
- 2015 “Rose Rosette Virus Mutates the Plant Gene *GAPC* in *Rosa tropicana*.” Brescia University Celebration of Excellence, 1st Place Poster Division & 1st Place Oral Presentation Division, Owensboro, KY

COURSES DEVELOPED:

Introductory Biology (on-ground and online), Introductory Nutrition, Cellular and Molecular Biology, Cellular and Molecular Biology Laboratory, Advanced Cell Biology and Advanced Cell Biology Laboratory, Genetics, Genetics Laboratory, Biochemistry, Biochemistry Laboratory, Advanced Research, Cancer Biology, Cancer Biology Laboratory, Sports Nutrition, Genetics and Society, and Interdisciplinary Senior Seminar.

MEMBERSHIP IN PROFESSIONAL SOCIETIES (Current Only):

- 2015-Present Society for the Advancement of Biology Education Research, National

2015-Present Partnership for Undergraduate Life Science Education, National
2015-Present American Society for Microbiology, National
2014-Present Kentucky Academy of Science, KY
2013-Present American Society for Cell Biology, National
2012-Present The Business of Life Sciences Collaboration, IN
2011-Present Graduate STEM Fellows in K-12 Education, National
2007-Present Phi Beta Kappa Society, National

EDUCATION DEVELOPMENT SKILLS:

Course-based and program-based assessment
Active learning classroom instruction
Flipped-classroom instruction
Course-based Undergraduate Research Experiences (CUREs)
Education manuscript publication
Grant writing
Interdisciplinary topics special program development
Adaptive learning strategies
Discipline-based education journal reviewer
Course design and curriculum management
Learning Management System operation (Moodle, Blackboard)
Mentor independent research
Website preparation and design
Non-technical summaries of my research for distribution
Press releases
Public lectures to non-scientists
Website design aimed for general public
Science fair competition judge
Journalist interviews for internet, TV, newspaper and magazines
Scientific blog publication
Dean and faculty search
CV review
Judge for science poster competitions
Advising training through the Ursuline Center for Teaching and Learning
Collaborator with career services
Work studies trained and mentored