Jennifer H. Doherty
Curriculum vitae

Assistant Professor of Biology and Physiology

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East Lansing, MI 48824

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Education

Ph.D. in Biology, University of Pennsylvania — 2009
Major Professor: Brenda B. Casper
Certificate of College Teaching and Learning

B.A. *cum laude* in Biology, with Distinction, University of Pennsylvania — 2000

Appointments

Assistant Professor, *Department of Physiology & Lyman Briggs College, Michigan State University* — 2022-present

Teaching Professor, *Department of Biology, University of Washington* — 2020-2022

Principal Lecturer, *Department of Biology, University of Washington* — 2019-2020

Senior Lecturer, *Department of Biology, University of Washington* — 2014-2019

Assistant Professor-Fixed Term — 2013-2014
Departments of Teacher Education and Plant Biology, Michigan State University

Curriculum Advisor, Bio-Inspired Technology and Systems Research Experience — 2010-2011
College of Engineering, Michigan State University

Post-doctoral Research Associate, PIs: Charles W. (Andy) Anderson, Tammy Long — 2009-2013
Departments of Teacher Education and Plant Biology, Michigan State University

Current Funding

National Science Foundation EHR Core Research (NSF 2400797) — 2024-2027
Collaborative Research: How do students develop principle-based reasoning in undergraduate physiology? Mechanisms for conceptual change — $985,684
Role: Lead PI This is a collaborative proposal with Michigan State University as the lead. Total requested project funding is $1,500,000 with other collaborating institutions University of Wisconsin Madison and Waubonsee Community College.

National Science Foundation STEM Education Postdoc Fellowship (NSF 2327451) — 2024-2026
Exploring the use of mechanistic reasoning in undergraduate physiology education — $273,807
Role: Sponsoring Researcher for Fellow Postdoctoral Fellow Keenan Noyes (PI)

Past Funding

National Science Foundation EHR Core Research NSF (NSF 1661263) — 2017-2021
Collaborative Research: Learning Progressions on the Development of Principle-based Reasoning in Undergraduate Physiology (LeaP UP) — $993,793
Role: Lead PI (This is a collaborative proposal with UW as the lead. Total project funding is $1,458,990 with collaborating institution Michigan State University—NSF 1660643)

National Science Foundation IUSE (NSF 1725149) 2017-2021
CAUSE for transformation: $917,793
The Consortium for the Advancement of Undergraduate Student Education
Role: Co-PI with PI Mary Pat Wenderoth, Department of Biology, University of Washington

UW Diversity & Inclusion Seed Grant 2019-2021
UW Biology Majors: Building Community and Diversifying Leadership $2,800
Role: Lead collaborating with Brian Buchwitz, Department of Biology, University of Washington

National Science Foundation Robert Noyce Research Program (NSF 1758264) 2018-2021
Effective Novice Teachers - How Systems of Support Can Transform the Clinical Experience During Teacher Preparation http://mentorteachers.org/ $800,000
Role: Co-PI with PI Karin Lohwasser, College of Education, University of Washington

National Science Foundation Robert Noyce Research Program (NSF 1540678) 2015-2018
The clinical experience for pre-service science educators: $799,003
An exploratory study of their collegial networks and "opportunity to learn" trajectories
Role: Co-PI with PI Mark Windschitl, College of Education, University of Washington

Math and Science Partnership WA Office of the Superintendent of Public Instruction 2015-2018
Partnership for Science and Engineering Practices II
Role: Institution of Higher Education Core Partner with Seattle Public Schools

National Science Foundation Discovery Research K-12 Grant (NSF 1221188) 2012-2015
Unifying Life: Placing Urban Tree Diversity in an Evolutionary Context $450,000
Role: Co-PI with Yael Wyner, City College of New York

National Science Foundation Doctoral Dissertation Improvement Grant (DDIG 0808273) 2008-2010
Is there niche partitioning among arbuscular mycorrhizal fungi? $11,896

Math and Science Partnership PA Department of Education Sub-Award 2007-2009
Teacher Professional Development Related to Inquiry $105,000
In the 10th grade Biology School District of Philadelphia Core Curriculum
Role: PI

Sigma Delta Epsilon/Graduate Women in Science Eloise Gerry Fellowship 2008-2009
Do different mycorrhizal fungal species serve different functions? $9,705

Publications

The standards of the biology education research field are that the senior lead author is the last author of the publication, and the first author is the trainee or person who conducted the majority of the research or writing. When the senior lead author is the author who conducted the majority of the research or writing, that will be indicated by †. Trainees are indicated: *undergraduate mentored, #graduate student mentored on project, ^postdoctoral scholar or junior staff scientist mentored.

Peer Reviewed Publications

32. Cole, E.J.*, **Doherty, J.H. 2024**. Student Perceptions of the Usefulness of Core Concepts When Reasoning in Physiology. *Advances in Physiology Education*. https://doi.org/10.1152/advan.00198.2024

31. Shiroda, M.^, Scott, E.E.^, **Doherty, J.H.,** Haudek, K.C. **2023.** Covariational reasoning and item context affect language in undergraduate mass balance written explanations. *Advances in Physiology Education*. 47(4), 762-775. https://doi.org/10.1152/advan.00156.2022
30. **Doherty, J.H.**†, Scott, E.E.^, Cerchiara, J.A.^, Jescovitch, L.N., Mcfarland, J., Haudek, K.C., & Wenderoth, M.P. **2023**. What a difference in pressure makes: A framework describing undergraduate students' reasoning about bulk flow down pressure gradients. *CBE Life Sciences Eduction*, 22(2), ar23. https://doi.org/10.1187/cbe.20-01-0003
29. **Doherty, J.H.**†, Cerchiara, J.A.^, & Wenderoth, M.P. **2023.** Undergraduate students' neurophysiological reasoning: What we learn from the attractive distractors students select. *Advances in Physiology Education*. 47(2), 222–236. https://doi.org/10.1152/advan.00128.2022
28. **Doherty, J.H.**†, Cerchiara, J.A.^, Scott, E.E.^, Jescovitch, L.N., Mcfarland, J., Haudek, K.C., & Wenderoth, M.P. **2023.** Oaks to arteries: The Physiology Core Concept of "flow down gradients" supports transfer of student reasoning. *Advances in Physiology Education*. 47(2), 282–295. https://doi.org/10.1152/advan.00155.2022
27. Dunster, G. P., Hua, I. J., Grahe, A., Fleischer, J. G., Panda, S., **Doherty, J. H.**, de la Iglesia, H. O. **2023.** Daytime light exposure is a strong predictor of seasonal variation in sleep and circadian timing of university students. *Journal of Pineal Research.* https://doi.org/10.1111/jpi.12843
26. Scott, E.E.^, Cerchiara, J.A.^, Mcfarland, J., Wenderoth, M.P., **Doherty, J.H. 2023.** How students reason about matter flows and accumulations in complex biological phenomena: an emerging learning progression for mass balance. *Journal of Research in Science Teaching*. https://doi.org/10.1002/tea.21791
25. Jackson, M. A.^, Moon, S.^, **Doherty, J. H.,** & Wenderoth, M. P. **2022**. Which evidence-based teaching practices change over time? Results from a university-wide STEM faculty development program. *International Journal of STEM Education*, 9(1), 1-15. https://doi.org/10.1186/s40594-022-00340-4
24. Wyner, Y.† & **Doherty, J.H. 2022.** Caring to know a name: An examination of New York City student attitudes towards knowing a tree's name. *Plants, People, Planet.* 1–20. DOI: 10.1002/ppp3.10249
23. Moon, S.^, Jackson, M.A., **Doherty, J.H.**, Wenderoth, M.P. **2021.** Evidence-based teaching practices correlate with increased exam performance in biology. *PLoS ONE* 16(11): e0260789. DOI: 10.1371/journal.pone.0260789
22. Jescovitch, L.N.^, Scott, E.E.^, Cerchiara, J.A.^, Merrill, J., Urban-Lurain, M., **Doherty, J.H.**, Haudek, K.C. **2020**. Comparison of Machine Learning Performance Using Analytic and Holistic Coding Approaches Across Constructed Response Assessments Aligned to a Science Learning Progression. *Journal of Science Education and Technology.* DOI: 10.1007/s10956-020-09858-0
21. Scott, E.E.^, Wenderoth, M.P., & **Doherty, J.H**. **2020**. Design-based research: A methodology to extend and enrich Biology Education Research. *CBE Life Sciences Education*. 19(3), es11, 1–12. DOI: 10.1187/cbe.19-11-0245
20. Kolpikova, E.P.*, Chen, D.C.* & **Doherty, J.H.**† **2019**. Does the format of pre-class reading quizzes matter? An evaluation of traditional and gamified, adaptive pre-class reading quizzes. *CBE Life Sciences Education*. 18(4), ar52. DOI: 10.1187/cbe.19-05-0098
19. Scott, E.E.^, Wenderoth, M.P., & **Doherty, J.H. 2019**. Learning Progressions: An Empirically Grounded, Learner-Centered Framework to Guide Biology Instruction. *CBE Life Sciences Education*. 18(4), es5. DOI: 10.1187/cbe.19-03-0059

18. Alred, A.R.#, Hartley, L.M., **Doherty, J.H.**, Harris, C., & Dauer, J.M. **2019**. Exploring student ideas about biological variation. *International Journal of Science Education*. 41(12), 1682-1700. DOI: 10.1080/09500693.2019.1635289
17. Cerchiara, J.A.^, Kim, K.J., Meir, E., Wenderoth, M.P., & **Doherty, J.H**. **2019**. A new assessment to monitor student performance in introductory neurophysiology: Electrochemical Gradients Assessment Device (EGAD). *Advances in Physiology Education*. 43(2), 211–220. DOI: 10.1152/advan.00209.2018
16. Jescovitch, L.N.^, Scott, E.E.^, Cerchiara, J.A.^, **Doherty, J.H.**, Wenderoth, M.P., Merrill, J.E., Urban-Lurain, M., Haudek, K.C. **2019**. Deconstruction of Holistic Rubrics into Analytic Rubrics for Large-Scale Assessments of Students' Reasoning of Complex Science Concepts. *Practical Assessment, Research and Evaluation* https://pareonline.net/getvn.asp?v=24&n=7
15. Moorleghen, D.*, Oli, N.*, Crowe, A.J., Liepkalns, J.S., Self, C.J. & **Doherty, J.H.**† **2019**. Impact of Automated Response Systems on In-Class Cell Phone Use. *Biochemistry and Molecular Biology Education*. DOI: 10.1002/bmb.21257
14. Wyner, Y. & **Doherty, J.H. 2019**. Seeing the trees: What urban middle school students notice about the street trees that surround them. *Journal of Biological Education*. 0(0), 1-23. DOI: 10.1080/00219266.2019.1667407
13. Le, P.T.#, Hartley, L.M., **Doherty, J.H.**, Harris, C., & Moore, J.C. **2018**. Is being familiar with biodiversity related to reasoning about ecology? *Ecosphere* 9(12):e02532. DOI: 10.1002/ecs2.2532
12. Jackson, M.A.*, Tran, A.*, Wenderoth, M.P., & **Doherty, J.H.**† **2018**. Peer- vs. self-grading of practice exams: Which is better? *CBE-Life Sciences Education*. 17:ar44 DOI: 10.1187/cbe.18-04-0052
11. **Doherty, J.H.**† & Wenderoth, M.P. **2017**. Implementing an Expressive Writing Intervention in a Large College Course. *Journal of Microbiology & Biochemistry Education*. 18(2). DOI: 10.1128/jmbe.v18i2.1307
10. Wyner, Y.† & **Doherty, J.H. 2017**. Developing a learning progression for three-dimensional learning of the patterns of evolution. *Science Education*. 00:1–31. DOI: 10.1002/sce.21289
9. Dauer, J.M., **Doherty, J.H.**, Freed, A., Miller, H., & Anderson, C.W. **2014**. Connections between student explanations and inquiry for plant photosynthesis and cellular respiration. *CBE Life Science* 13:397-409. DOI: 10.1187/cbe.14-02-0028
8. Rice, M.J., **Doherty, J.H.**, & Anderson, C.W. **2014**. Principles, First and Foremost: A Tool for Understanding Biological Processes. *Journal of College Science Teaching*. 43(3): 74-82.
7. Harris, C., Berkowitz, A.R., **Doherty, J.H.**, & Hartley, L.M. **2013**. Exploring biodiversity's big ideas in your school yard. *Science Scope* 36:8.
6. Momsen, J.L., Clark, S.K., **Doherty, J.H.**, Schramm, J.W., & Geraghty Ward, E.M. **2012**. Lost in translation: Quantifying the overlap of popular media and non-majors science course assessment vocabulary. *Ecosphere* 3:43. DOI: 10.1890/ES11-00311.1
5. **Doherty, J.H.**, Harris, C., & Hartley, L.M. **2011**. Using Stream Leaf Packs to Explore Community Assembly. *Teaching Issues and Experiments in Ecology*, Vol. 7: Experiment #3.
4. Spindler, L.H.* & **Doherty, J.H.*** **2009**. Assessment of the teaching of evolution by natural selection through a hands-on simulation. *Teaching Issues and Experiments in Ecology*, Vol. 6: Research #2. *These authors contributed equally
3. Casper, B.B, Bentivenga, S.P., Ji, B., **Doherty, J.H.**, Edenborn, H.M., & Gustafson, D.J. **2008**. Plant-soil feedback: Testing the generality with the same grasses in serpentine and prairie soils. *Ecology*. 89(8): 2154-64. DOI: 10.1890/07-1277.1

2. **Doherty, J.H.**, Ji, B., & Casper, B.B. **2008**. Testing nickel tolerance of *Sorghastrum nutans* and its associated soil microbial community from serpentine and prairie soils. *Environmental Pollution*. 151(3): 593-598. DOI: 10.1016/j.envpol.2007.04.002

1. Nobel, P.S., De la Barrera, E., Beilman, D.W.*, **Doherty, J.H.***, & Zutta, B.R.* **2002**. Temperature limitations for cultivation of edible cacti in California. *Madroño*. 49(4): 228-236. *These authors contributed equally

Under review & In revision

Doherty, J.H.†, Todd*, K.A., Wenderoth, M.P., VanDerSlik*, A.L., & Cole*, E.J. **In Review**. Principles Successfully Guide Students' Generative Mechanistic Reasoning In Biology. Submitted to *CBE-Life Science Education*. Doherty and Todd are co-first authors.

Invited publications *Peer-reviewed

*Miller, H., Johnson, W., Freed, A., **Doherty, J.H.**, & Anderson, C.W. **2024**. The Role of Crosscutting Concepts in Developing a Three-dimensional Learning Progression Framework. *Handbook on Science Learning Progressions.* Invited peer-reviewed chapter.

*Shiroda, M.^, **Doherty, J.H.,** Haudek, K.C. **2024.** Exploring Attributes of Successful Machine Learning Assessments for Scoring of Undergraduate Constructed Response Assessment Items. *AI in science education*. Invited peer-reviewed chapter.

Prevost, L., Sorensen, A. E., **Doherty, J. H.**, Ebert-May, D., & Pohlad, R. **2019**. 4DEE—What's Next? Designing Instruction and Assessing Student Learning. *The Bulletin of the Ecological Society of America*, 0(0), e01552. DOI: 10.1002/bes2.1552

*Anderson, C.W. & **Doherty, J.H.**† **2016**. Core Idea LS2: Ecosystems: Interactions, Energy, and Dynamics. *In* Duncan, R.G., Krajcik, J., Rivet, A. (Eds.) *Disciplinary Core Ideas: Reshaping Teaching and Learning.* NSTA press. Arlington, VA. Invited peer-reviewed chapter.

Invited talks and Webinars *Scheduled, but not yet given

2025* University of Oregon. Department of Human Physiology. Eugene, OR.

2025* University of Wisconsin-Madison. Department of Kinesiology. Madison, WI.

2024 University of Georgia. Department of Physiology. Athens, GA. *Physiology Core Concepts Guide Students' Successful Mechanistic Reasoning.*

2024 KBS K-12 Partnership Summer Institute Keynote. Kellogg Biological Station. Hickory Corners, MI. *From Partnership to Practice: How the K-12 Partnership Shaped My Teaching.*

2024 From Concept to Classroom Center for Physiology Education Event @ the American Physiological Summit Keynote. Long Beach, CA. *Framing your teaching with the Physiology Core Concepts.*

2024 Wayne State University. Department of Physiology. Detroit, MI. *Oaks to Arteries: The Physiology Core Concept of flow down gradients supports transfer of student reasoning.*

2023 University of Toronto. Department of Physiology. Toronto, ON. *Oaks to Arteries: The Physiology Core Concept of flow down gradients supports transfer of student reasoning.*

2023 American Physiological Society Webinar. Getting *Started in Educational Research.*

2022 University of Pennsylvania. Department of Biology. Philadelphia, PA. Casper Career Symposium. *What are your students thinking?*

2022 Michigan State University. Department of Physiology. East Lansing, MI. *What are your students thinking about Bulk Flow?*

2019 SimBio Webinar. *Using flux reasoning and the Action Potential Extended Tutorial to improve students' understanding of ion movement.*

2019 University of Minnesota. Department of Biology Teaching and Learning Seminar. Minneapolis, MN. *Principle-based Reasoning: A Tool for Understanding Biological Processes.*

2019 Life Discovery Conference Key Note. Gainesville, FL. *Is the ability to identify organisms a prerequisite for understanding biodiversity, ecology and the patterns of evolution?*

2018 STEM Leadership Summit Key Note. Lake Stevens School District. *Talkin' 'bout a Revolution in Undergraduate STEM Education.*

Honors and Awards

Michigan State University Teacher-Scholar Award, 2024
University of Washington Distinguished Teaching Award, 2019—highest teaching recognition at UW
University of Washington Distinguished Teaching Award Nomination, 2018
McLoughlin High School Hall of Fame, Class of 2017
Ecological Society of America 2017 Education Scholar
NSF FIRST IV Post-doctoral teaching fellowship, 2011-2013
Chair's Award in Biology at the University of Pennsylvania, 2000
Rose Award for Undergraduate Research, 2000

Teaching Experience

Michigan State University
- Introductory Biology II: Cells and Molecules Lecture *(*LB145, *2 semesters)* 2024-present
- Introductory Biology II: Cells and Molecules Lecture and Lab *(*LB145, *3 semesters)* 2022-2024
- Research Experiences in Biology (LB348, *2 semesters*) 2023-2024
- Advanced Directed Study—Biology (LB490B, *2 students*)
- Introductory Biology: Genes, Evolution, Ecology Lecture *(2 semesters)* 2011-2012
  Once for Lyman Briggs College, once for the College of Natural Sciences
- Science for Elementary Schools *(pre-service teachers)* 2011
- Teaching Science to Diverse Learners—Elementary *(pre-service teachers)* 2010

University of Washington
- Introductory Biology III: Animal and Plant Physiology *(22 quarters)* 2014-2022
  Mentor for and co-instructor with one Graduate Student Instructor of Record, two Mentored Teaching Opportunity Postdocs, and one faculty member new to Introductory Biology
- Plant Physiology and Development with CURE lab (*2 quarters*) 2019, 2020
- Intensive Introductory Biology: Human Health Emphasis with CURE lab 2018
  Coordinator and Instructor, Course combined all of Intro Bio into an intensive 10 wk, 15 credit course

University of Pennsylvania
- Teaching Secondary School Biology *(2 semesters, in-service teachers)* 2008-2009
- Learning Biology by Teaching Biology in an Urban High School *(4 semesters)* 2003-2007

Graduate Students and Postdoctoral Fellows

SS25 Alexander Waugh, Postdoctoral Research Associate Supervisor	SS25-present
Aeryn VanDerSlik, Master's Advisor	FS24-present
Hannah Thompson, Ph.D. Advisor	FS24-present
Regan Levy, Ph.D. Committee, Member	FS24-present
Keenan Noyes Postdoctoral Fellow Supervisor	SU24-present
John Byrd Ph.D. Committee, Member	SU24-present
Michele Weston Ph.D. Committee, Member	FS23-present

Emily Scott, Postdoctoral Research Associate Supervisor 2017-2020
Jack Cerchiara, Postdoctoral Research Associate Supervisor 2017-2019

Mentored Undergraduate Research Projects

TBD, Nicole Rockett, Morgan Kasyouhanan, Aarav Contractor 2024-present
Principle-based Reasoning in Physiology 2024-present
Zach Beatty, Nicole Peters, Madison Tate-Rankin
Design-based Research: Fainting Teaching Module, Helena Haddad 2024-present
Student perceptions of Physiology Core Concepts, Eli Cole 2023-2024
Flux Across Physiological Systems, Kelly Sullivan 2024
Students reasoning about Ion Flux, Aeryn Van der Silk (matriculated as Master's student) 2023-2024
Principles guide successful mechanistic reasoning in Biology, Kylie Todd, Jess Cherniawsky 2022-2024
Teaching DNA Replication Mechanistic Reasoning Using Stop-motion Animation, Margaret Stosio 2023
What is the impact of auto-pausing lecture on students' behavior and performance? 2020-2023
Sheharbano Jafry, Jennifer Chen
Equity in Automated Scoring of Constructed Response Assessments 2020-2022
Abigail Gilbert, Jill Kimasaka
Undergraduate's Understanding of Ventilation, Anushka Ladha, Aida Moghadasi 2020-2022
Poll Everywhere's Impact on Cell Phone Use in Introductory Biology 2017-2019
Dylan Moorleghen, Naresh Oli
Adaptive Learning Reading Quizzes in Introductory Biology, Elena Kolpikova 2017-2019
Demographics Impact Random Call Participation, Derek Chen 2017-2018
Impact of In-Class Question Characteristics on 2017-2018
Quality of Student Reasoning During Peer Discussions, Edith Serna, Melissa Mallen
How Biology Students Think About Cardiovascular Pressure Gradients and Flux 2017-2018
Bryan Day, Aquene Reid
Self- or Peer-grading on Practice Exams: Which is Better?, Mallory Jackson, Alina Tran 2016-2018
Study Resources of Undergraduate Students in Introductory Biology, Osman Salahuddin 2016-2017
The Key to Successful Problem Solving: Identifying Keywords?, Sarah Farrell 2016-2017
Designing Learning Progression Assessments that Assess Principles First 2012-2013
Kathryn Oleszkowicz

Service to Discipline

Science Education, Editorial Board Member 2025-2027
NSF Review Panel, Member 2025
Anatomy & Physiology Teaching and Learning Community, Founder and Organizer 2021-present
A monthly faculty learning community for physiology and anatomy faculty
https://sites.google.com/uw.edu/ap-tlc/
Ecological Society of America (ESA) Four-Dimensional Ecology Education 2019-present
Subcommittee, Member
Society for Biology Education Research (SABER) Anatomy and Physiology SIG, Organizer 2016-present
American Physiology Society (APS) Center for Physiology Education 2022-2023
Physiology Education Research Resource Working Group, Member
https://www.physiology.org/professional-development/career/cpe/physiology-education-research
SABER Award Committee, Chair 2019-2023
Advances in Physiology Education, Guest Editor, *Core Concepts in Physiology Special Issue* 2021-2022

Ecosphere, Editorial Board Member (Monitoring Editor)	2020-2022
ESA *EcoEd Digital Library*, Editor (Monitoring Editor)	2015-2022
ESA Committee for Diversity and Education, Member	2019-2021
ESA Education Section, Vice Chair-Chair-Past Chair	2017-2021
ESA Four-Dimensional Ecology Education Taskforce	2015-2019
Framework available: https://www.esa.org/4DEE/	
NSF Review Panel, Member	2017
Northwest PULSE UW Biology group, Member	2015
ESA CourseSource Ecology Framework developer	2014
Framework available: http://www.coursesource.org/courses/ecology	
ESA Education and Human Resources Committee, Member	2007-2010

Reviewer for Journals, Textbooks, Annual meetings:
Advances in Physiology, *CBE-Life Sciences Education*, *Cognitive Research: Principles and Implications*, *Ecosphere*, *Journal of STEM Education*, *Life* by Sadava et al., NARST, SABER, *Science Education*

Service to the Department

MSU Physiology Graduate Program Committee, Member	2023-present
MSU Physiology Education Committee, Member	2022-present
UW Biology Teaching Professor Pod Captain	2021-2022
UW Biology Introductory Series Textbook Faculty Review Committee, Member	2021
UW Biology Majors Building Community Project, Lead	2020-2022
UW Biology Greenhouse Committee, Member	2020-2021
UW Biology Graduate and Postdoc Program Committee, Member	2020-2021
UW Biology Research Committee, Member	2016-2018, 2019-2020, 2021-2022
UW Biology Learning & Teaching Community, Member and presenter	2014-2022
UW Biology Integrated Physiologist Faculty Search Committee, Member	2018-2019
UW Biology Mentored Teaching Opportunity Post-doc for Hiring Committee, Member	2015, 2018, 2019
UW Biology Research Committee *ad hoc* sub-committee for Teaching Equipment, Lead	2017-2018
UW Biology BIOL 240 (All three quarters of Intro Bio into 10-wk course), Course organizer	2017-2018
UW Biology Faculty Search Committee, *ad hoc* Reviewer	2017-2018
UW Biology UPC *ad hoc* sub-committee for the Introductory Series Textbook, Chair	2016
UW Biology Physiology Lecturer Search, Requested contributor	2015
UW Biology Undergraduate Program Committee (UPC), Member	2014-2016
UW Biology Greenhouse Planning Committee, Member	2014-2015
UW Biology HHMI Authentic Research in Intro Bio Research Scientist Hiring Committee	2014

Service to the College

MSU LBC Education Program Committee, Member	2024-present
MSU LBC Biology Major APR Year 1 Committee, Chair	2024-present
MSU LBC Biology Group, Convener	Fall 2024
MSU LBC Chemistry Education Research Tenure-stream Search Committee, Member	2022-2023

Service to the University

MSU Biology Education Research Monthly Journal Club, Organizer 2025-present
MSU Women in STEM RSO, Faculty Advisor 2023-present
MSU University Committee on Faculty Affairs, LBC Alternate Representative Fall 2023
AAU Undergraduate STEM Education Initiative, UW Representative 2018-2022

University-level Professional Development, Lead or Organized

PMIG Annual Meeting "Teaching with Physiological Core Concepts" Workshop, invited co-leader 2024
ESA Four-Dimensional Ecology Education Extravaganza Virtual Conference, Program Chair 2024
American Physiological Society Flow Down Gradients Online Learning Module, Author 2023-24
A&P Teaching and Learning Community presentations, Presenter
"Using Modeling to Teaching a Gas Exchange and Hb Loading Mechanistically", Nov. 2024
"Teaching Blood Glucose Regulation with the Glycemic Index & Core Concepts", Oct. 2024
"Comparing Different 'Unpackings' of Core Concepts", May 2024
"Blood Pressure is a Mass Balance Problem", February 2024
"Mechanistic Reasoning in Physiology", October 2023
American Physiology Society Center for Physiology Education Pre-Summit Conference 2024
"Core Concepts Assessment" Workshop, co-leader
MSU Lyman Briggs College, "Alternative Grading" Workshop, co-leader 2023
American Physiology Society Center for Physiology Education Pre-Summit Workshop 2023
"Navigating Educational Research", Workshop Head mentor for Experimental Design and Data Analysis.
SABER Conference, Virtual 2021
"Assess what's important: Creating assessments that show how students use their knowledge and how instruction promotes that knowledge" Workshop, co-leader
Ecological Society of America (ESA) Annual Meeting, Virtual 2021
"Assess What's Important: Creating Assessments That Show How Students Use Their Ecological Knowledge" Workshop, co-leader
SABER West Virtual Conference, UC Irvine 2021
"Assess what's important: Creating assessments that show how students use their knowledge"
ESA 4DEE Extravaganza Virtual Workshop, organizer and presenter 2020
SABER West Conference, UC Irvine, co-leader 2020
"Assess what's important:
Creating assessments that show how students use their knowledge" Workshop
SABER West Conference, UC Irvine, co-leader 2020
"Using computer-scorable, constructed-response formative assessments to transform your teaching of principle-based reasoning in biology" Workshop
Human Anatomy and Physiology Society (HAPS) Conference, Portland, OR, co-leader 2019
"Using Learning Progression Frameworks and Assessments to Improve Principle-based Physiology Instruction." Workshop
ESA Annual Meeting, Louisville, KY, co-organizer and presenter 2019
"Resources for Ecology Education – Fair and Share (REEFS)" Workshop
SABER West Conference, UC Irvine, co-leader 2019
"Using Learning Progression Frameworks and Assessments to Improve Principle-based Instruction" Workshop

ESA Annual Meeting, New Orleans, LA, co-leader 2018
"Turn Your Research Figures or Educational Resource into a Peer-reviewed Product for Teaching: Submit to ESA' EcoEd Digital Library" Workshop
Northwest BIO, Portland, OR, co-developer 2018
"Using Learning Progression Assessments to Inform Your Physiology Teaching" Workshop
SABER West Conference, UC Irvine, co-leader 2018
"Using Whiteboards to Leverage Learning in Multiple Settings" Workshop
HAPS Conference, Salt Lake City, UT, co-leader 2017
"Using an Action Potential Simulation" Workshop
SABER West Conference, UC Irvine, co-leader 2017
"Developing a learning progression framework and assessments" Workshop
NARST Annual Conference, co-leader 2014
"Developing and validating learning progression-based written assessments" Pre-Conference Workshop
Introductory Biology Project Summer Conference, Washington, D.C. , co-leader 2012
"Whole course transformation for introductory biology"
ESA Annual Meeting, Austin, TX 2011
Organizer, "From Reasoning to Action: Environmental Literacy for Effective Earth Stewardship" Organized Oral Session
Co-leader, "Using Qualitative Data in Ecology Research and Teaching: An Introduction to Conducting and Analyzing Interviews" Workshop
Learning Progressions Footprint Conference for the National Science Foundation 2011
Postdoctoral assistant to conference organizers
ESA Annual Meeting, Pittsburgh, PA 2010
Organizer, High School Educators' Ecological Literacy and Research Day
Co-Organizer, "Training the next generation of ecologists: how universities are doing it" Organized Oral Session
National Science Teachers Association National Conference, Philadelphia, PA 2010
Organizer, "A Hands-On/Minds-On Activity for Teaching Molecular Biology" Workshop
ESA Annual Meeting, Albuquerque, NM 2009
Co-Organizer, "Mentoring for success" Workshop
ESA Annual Meeting, Milwaukee, WI 2008
Co-Organizer, High School Educators' Ecological Literacy and Research Day
Organizer, "The Art of Mentoring: How to get out of your box" workshop; Co-Organizer, "Extending Your Research into Policy and Adult Education: 2 for the Price of 1" Workshop

K-12 Professional Development

Renton Public Schools 2016-2020
Once yearly curriculum consultant for middle school and high school biology teachers.
Seattle Public Schools 2014-2017
Co-organized and led summer institutes and quarterly professional development for middle school biology teachers.
National Science Teachers Association (NSTA) National Conference, Indianapolis, IN, co-leader 2012
"Using Learning Progressions to Improve Science Teaching and Learning" Short Course for educators
College of Engineering, Michigan State University 2010-2011

As curriculum advisor, assisted teachers in translating their summer Bio-Inspired Technology and Systems Research Experience in engineering into curricula for their classrooms.

Western Michigan Schools 2009-2014

Co-organized and led summer institutes and quarterly professional development for elementary, middle and high school science teachers through MSU's Kellogg Biological Station LTER and the MSU College of Education.

School District of Philadelphia 2004-2009

Co-developed and co-taught a monthly professional development and summer institutes for High School Biology Teachers. When Penn's NSF GK-12 grant ended (see above), I leveraged my performance as a GK-12 fellow into a grant from the School District of Philadelphia to continue my work with teachers and the District.

K-12 Curricula

Doherty, J.H., Harris, C., and Hartley, L.M. September 2012. Biodiversity: Diversity in a Leaf Pack. High school and middle school unit.

Doherty, J.H., Mohan, L., Cisterna, D., and Anderson, C.W. April 2010. How Do Plants Grow? Plant Cells and Processes. High school and middle school units.

Carbon: Transformation in Matter and Energy (TIME) units contributing author

Hands-on, minds-on biology activities coordinated with the School District of Philadelphia's Core Curriculum and the Next Generation Science Standards.

Professional Memberships and Associations	**Since**
International Society of the Learning Sciences	2024
American Physiological Society	2018
Society for the Advancement of Biology Education Research	2011
National Association of Research in Science Teaching	2010
Ecological Society of America	2000

Significant Professional Development as a Participant

Anatomy & Physiology Teaching and Learning Community, meets monthly	2021-present
Biology Core Concepts Teaching Tools Project, 12-month program	2024-present
NFCCD Faculty Success Program, 10-week program	Summer 2024
MSU 3D Learning STEM Fellowship, 18-month fellowship	2022-23
Biology Learning & Teaching Community, met weekly	2014-2022
Teaching Computational Neuroscience, weeklong workshop	2017

Oral Presentations

***undergraduate mentored, #graduate student co-mentored on project, ^ post-doc mentored**

VanDerSlik, A.*, **Doherty, J.H.** (2024) *Conceptual Currents: Undergraduate Understandings of Ion Flux Mechanisms*. Talk presented at Physiology Majors Interest Group (PMIG) Annual Meeting, Toronto, ON, Canada.

Olson, D., Thompson, H.#, Zubek, J. F., **Doherty, J.H.** (2024) *Enhancing Student Understanding of Physiological Processes through Explicit Causality Instruction*. Talk presented at Physiology Majors Interest Group (PMIG) Annual Meeting, Toronto, ON, Canada.

Doherty, J.H., Cole, E.* (2024) *From Classroom to Concept: Exploring Student Perceptions of Physiology's Core Concepts*. Talk presented at Physiology Majors Interest Group (PMIG) Annual Meeting, Toronto, ON, Canada.

Doherty, J.H., Todd, K. A.*, Cherniawsky, J.*, VanDerSlik, A.*, Cole, E.* (2024) *Principles support mechanistic reasoning in Biology*. Talk presented at SABER Annual Meeting, Minneapolis, MN.

Shiroda, M^, Gilbert, A.*, Kumasaka, J.K.*, Scott, E.E.^, Haudek, K.C., **Doherty, J.H.** (2024) *Detecting and Correcting Scoring Bias in Artificial Intelligence based Computer Scoring Models*. Talk presented at SABER East Meeting, Rochester, NY.

Doherty, J.H. (2023) *Spotlight on Core Concepts of Physiology at the Summit: Oaks to arteries: The Physiology Core Concept of "flow down gradients" supports transfer of student reasoning*. Talk presented at American Physiological Summit, American Physiological Society, Long Beach, CA.

Doherty, J.H. (March 2023) *Getting Started in Educational Research*. Presented at Center for Physiology Education Webinar, American Physiological Society.

Doherty, J.H. (2023) Reasoning about changes in amount in dynamic systems. Lightening talk presented at Lyman Briggs College.

Doherty, J.H. (2023) Oaks to arteries: The Physiology Core Concept of "flow down gradients" supports transfer of student reasoning. I was invited to give my submitted poster as a talk at American Physiological Summit for a session called "Spotlight on Core Concepts of Physiology at the Summit".

Doherty, J. H., Scott, E. E., Moghadasi, A.* & Wenderoth, M. P. (2022). A learning progression characterizing student reasoning about bulk flow in animals and plants. Talk presented at SABER, Minneapolis, MN.

Scott, E. E.^, Wenderoth, M. P., & **Doherty, J. H.** (2021). How do we support deep learning? Instructional tools grounded in conceptual frameworks. Talk presented at SABER West Virtual Meeting.

Doherty, J. H., Scott, E. E.^, & Wenderoth, M. P. (2021). Student reasoning about changes in amount in dynamic biological systems. Talk presented at SABER West Virtual Meeting.

Doherty, J. H., Scott, E. E.^, & Wenderoth, M. P. (2021). Student reasoning about changes in amount in dynamic biological systems. Talk presented at University of Washington Department of Biology Virtual Retreat.

Scott, E. E.^, Wenderoth, M. P., & **Doherty, J. H.** (2020). A learning progression characterizing how students use mass balance reasoning to understand biology. Talk presented at SABER Virtual Meeting.

Doherty, J. H., Scott, E. E.^, Cerchiara, J. A.^, McFarland, J. L., & Wenderoth, M. P. (2019). A Learning Progression Characterizing How Biology Students Understand Ion Movement. Talk presented at NARST, Baltimore, MD.

Scott, E. E.^, Cerchiara, J. A.^, Jescovitch, L. N.^, Wenderoth, M. P., & **Doherty, J. H.** (2019). An emerging learning progression characterizing how students use mass balance reasoning to understand physiology. Talk presented at NARST, Baltimore, MD.

Jescovitch, L. N.^, **Doherty, J. H.**, Scott, E. E.^, Cerchiara, J. A.^, Wenderoth, M. P., Urban-Lurain, M., … Haudek, K. C. (2019). Challenges in developing computerized scoring models for principle-based reasoning in a physiology context. Paper Set: Measuring complex constructs in science education: Applications of automated analysis. Poster presented at NARST, Baltimore, MD.

Doherty, J.H., Moon, S.^, Weigand, D., Wenderoth, M.P. 2019. Differential implementation of evidence-based teaching is correlated to student achievement gaps Presented at ESA Annual Meeting, Louisville, KY.

Wenderoth, M.P, Moon, S.^, Jackson, M.A., **Doherty, J.H.** 2019. Evidence-based teaching: Which Parts Impact Student Learning? Presented at SABER, Minneapolis, MN.

Doherty, J.H., Scott, E.E.^, Cerchiara, J.A.^, McFarland, Parker, J, & Wenderoth, MP. 2018. Developing a learning progression in physiology to characterize how students reason about ion movement. Presented at SABER, Minneapolis, MN.

Wenderoth, M.P., **Doherty, J.H.**, McFarland, J., Cerchiara, J.A.^ & Scott, E.E.^ 2018 Monitoring Students' Principle-Based Reasoning in Animal and Plant Physiology Using Computer-Scorable Constructed Response Assessments. Northwest BIO 2018, Portland, OR.

Doherty, J.H., Scott, E.E.^, Cerchiara, J.A.^, McFarland, J., Haudek, K., Urban-Lurain, M., Merrill, J., & Wenderoth, M.P. 2018. Developing Learning Progressions in Undergraduate Physiology (LeaP UP). SABER West, UC Irvine.

Cerchiara, J.A.^, Scott, E.E.^, Wenderoth, MP, & **Doherty, J.H**. 2018. Student performance and ability increases following a novel neurophysiology simulation. SABER West, UC Irvine.

Jackson*, M., Tran*, A., Farrell*, S., Salahuddin*, O., Wenderoth, M.P., & **Doherty, J.H.** 2017. Self-Versus Peer-Grading of Practice Exams: Which is Better? SABER, Minneapolis, MN.

Wenderoth*, M.P. & **Doherty*, J.H.** 2017. Implementing an intervention for test anxiety in a biology classroom. SABER West Meeting, UC Irvine, CA. *These authors contributed equally

Doherty, J.H., Kim, J., Draney, K. & Anderson, C.W. 2016. Does Principle-oriented Instruction Improve Student Performance in Novel Contexts? Presented at the annual meeting of NARST, Baltimore, MD.

Scott, E.E, Dauer, J.M., **Doherty, J.H.**, & Anderson, C.W. 2016. Refining an Inquiry-Based Learning Progression Framework That Describes Students' Approach to Scientific Practices and Uncertainty. Presented at the annual meeting of NARST, Baltimore, MD.

Draney, K., **Doherty, J.H.**, Anderson, C.W. & Kim, J. 2016. What We've Learned About Learning Progressions, Items, and Scoring Guides From Using Item Response Models. Paper presented at the Annual Meeting of the American Educational Research Association, Washington, D.C.

Irish, T., Berkowitz, A.R., Parker, S., **Doherty, J.H.,** Johnson, M., Yestness, N., Caplan, B., Hartley, L.M., Class, F.N., & Moore, J.C. 2015. Learning Progressions in Environmental Science: The Impact of a Professional Development on Teacher Practice. Presented at the annual meeting of NARST, Chicago, IL.

Doherty, J.H., Hartley, L., Harris, C., & Anderson, C.W. 2014. Developing Understanding of Evolution in Complex Contexts. Presented at the 4th Annual Meeting of the Society for the Advancement of Biology Education Research, Minneapolis, MN.

Doherty, J.H., Hartley, L., Harris, C., & Anderson, C.W. 2014. Developing Understanding of Evolution in Complex Contexts. Presented at the annual meeting of NARST, Pittsburgh, PA.

Freed, A.L., Dauer, J. M., **Doherty, J.H.**, Johnson, W.R., & Anderson, C.W. 2014. Connections between students' explanations and interpretations of arguments from evidence. Presented at the annual meeting of NARST, Pittsburgh, PA.

Hartley, L., **Doherty, J.H.**, Harris, C., Moore, J.C., Berkowitz, A.R., & Anderson, C.W. 2014. Learning Progression Framework and Assessments for Community Ecology. Presented at the annual meeting of NARST, Pittsburgh, PA.

Miller, H.#, Freed, A.L., **Doherty, J.H.**, Johnson, W.R., & Anderson, C.W. 2014. Components of Productive Level 3 Reasoning. Presented at the annual meeting of NARST, Pittsburgh, PA.

Moore, J.C., Hartley, L., **Doherty, J.H.**, Harris, C., Berkowitz, A.R., & Anderson, C.W. 2014. Ecological Systems and Learning Progressions: Applications of Basic Principles across Multiple Scales of Organization. Presented at the annual meeting of NARST, Pittsburgh, PA.

Wyner, Y. & **Doherty, J. H.** 2014. Unifying Life: Placing Urban Tree Diversity into an Evolutionary Context. Presented at the annual meeting of NARST, Pittsburgh, PA.

Harris, C., Berkowitz, A.R., Hartley, L. M., & **Doherty, J.H.** 2013. Teaching Biodiversity Using a Learning Progression Framework and Leaf Packs. 42nd North American Association for Environmental Education Annual Conference. Baltimore, Maryland.

Doherty, J.H., Hartley, L.M., Harris, C., Anderson, C.W., Berkowitz, A., & Moore, J.C. 2013. Using learning progressions to describe how students develop increasingly sophisticated understandings of biodiversity. 98th ESA Annual Meeting. Minneapolis, MN.

Anderson, C.W., Dauer, J.M., & **Doherty, J.H.** 2013. Learning progression theory: Background and application to ecology teaching and learning. 98th ESA Annual Meeting. Minneapolis, MN.

Doherty, J.H., Rice, J., & Anderson, C.W. 2013. Principles, First and Foremost: A Tool for Understanding and Teaching Biological Processes. 3rd Annual Meeting of SABER, Minneapolis, MN.

Hartley, L., **Doherty, J.H.**, Harris, C., Anderson, C.W., Berkowitz, A., & Moore, J. 2013. Using scenario-based assessments to build a learning progression framework for reasoning about ecosystems. Paper presented at annual meeting of NARST, Rio Grande, PR.

Oleszkowicz, K.*, **Doherty, J.H.**, & Anderson, C.W. 2013. Designing Learning Progression Assessments that Assess Principles First. Paper presented at the Annual Conference of NARST, Rio Grande, PR.

Doherty, J.H., Anderson, C.W., Gunckel, K., Hartley, L.M., Schramm, J.W., & Covitt, B. 2012. Using Learning Progression Frameworks and Assessments to Guide Research and Professional Development. Paper presented at the Annual Meeting of the American Educational Research Association, Vancouver, BC.

Doherty, J.H., Draney, K., & Anderson, C.W. 2012. Methodological Issues in Developing a Learning Progression based Assessment System. Paper presented at the Annual Conference of NARST, Indianapolis, IN.

Schramm, J.W., **Doherty, J.H**., & Anderson, C.W. 2012. Analyzing College Students' Learning About Carbon Transforming Processes. Paper presented at the Annual Conference of NARST, Indianapolis, IN.

Doherty, J.H., Schramm, J.W., & Anderson, C.W. 2011. The Role of Heredity and Environment in Students' Accounts of Adaptation by Selection and Phenotypic Plasticity. 96th ESA Annual Meeting. Austin, TX.

Covitt, B., **Doherty, J.H.**, & Pitot, L. 2011. Developing an environmental science citizenship learning progression framework. 96th ESA Annual Meeting. Austin, TX.

Berkowitz, A.R., Parker, S., Tschillard, R., Caplan, B., **Doherty, J.H.**, Whitmer, A., & Moore, J.C. 2011. How can professional development help teachers use learning progressions in teaching for environmental science literacy? 96th ESA Annual Meeting. Austin, TX.

Doherty, J.H. & Anderson, C.W. 2011. The Role of Heredity and Environment in Students' Accounts of Adaptation by Selection and Phenotypic Plasticity. 2011 NARST Annual International Conference. Orlando, FL.

Zhan, L., Cisterna, D., **Doherty, J.H.**, Anderson, C.W., Choi, J., Lee, Y., & Draney, D. 2011. The Effects of Teaching Materials and Teachers' Approaches on Student Learning about Carbon-transforming Processes. 2011 NARST Annual International Conference. Orlando, FL.

La Due, N.#, **Doherty, J.H.**, Gunkel, K., & Covitt, B. 2010. Exploring teacher and student conceptions of groundwater through drawings. 39th North American Association of Environmental Education Meeting. Buffalo, NY.

Anderson, C.W., D'Avanzo, C., Hartley, L.M., Wilke, B., & **Doherty, J.H.** 2010. Comparing student understanding of carbon-transforming processes across colleges and universities: Why do misunderstandings persist? 95th ESA Annual Meeting. Pittsburgh, PA.

Momsen, J.L., Clark, S., Haudek, K., Geraghty Ward, E., Schramm, J.W., **Doherty, J.H.**, & Vergara, C. 2010. Lost in translation: Quantifying the overlap of popular media and non-majors science course assessment vocabulary. 95th ESA Annual Meeting. Pittsburgh, PA.

Hartley, L.M., **Doherty, J. H.**, Anderson, C.W., Burke, M., Garcia, Y., Harris, C.B., MacGregor, M., McMahon, S., Moore, J.C., Simon, S.E., & Wilke, B. 2010. Pathways to environmental literacy: Developing a biodiversity learning progression. 95th ESA Annual Meeting. Pittsburgh, PA.

Spindler, L. H.*, **Doherty, J. H.***, Bowman, C.*, & Stovall, I.* 2010. Transforming undergraduate education: Institutionalizing outreach with academically-based community service courses. 95th ESA Annual Meeting. Pittsburgh, PA. *These authors contributed equally

Spindler, L. H.* & **Doherty, J. H.*** 2008. Evaluating science process skills in high school students: Establishing a baseline. 93rd ESA Annual Meeting. Milwaukee, WI. *These authors contributed equally

Doherty, J. H. and Casper, B. B. 2008. Do Soil Factors Shape Arbuscular Mycorrhizal Fungal Communities in a Serpentine Grassland? 93rd ESA Annual Meeting. Milwaukee, WI.

Spindler, L. H.* & **Doherty, J. H.*** 2007. The efficacy of teaching content knowledge through hands-on activities in high school biology. 92nd ESA Annual Meeting. San Jose, CA. *These authors contributed equally

Doherty, J. H. & Casper, B. B. 2007. Investigating the Maintenance of Arbuscular Mycorrhizal Fungal Communities. 92nd ESA Annual Meeting. San Jose, CA.

Poster and Roundtable Presentations

***undergraduate mentored**, **#graduate student co-mentored on project**, **^ post-doc mentored**

VanDerSlik, A.*, **Doherty, J.H.** (2024) Conceptual Currents: Undergraduate Understandings of Ion Flux Mechanisms. Poster presented at MSU CREATE for STEM Mini-Conference, East Lansing, MI.

Cole, E.*, **Doherty, J.H.** (2024) From Classroom to Concept: Exploring Student Perceptions of Physiology's Core Concepts. Poster presented at MSU CREATE for STEM Mini-Conference, East Lansing, MI.

VanDerSlik, A.*, **Doherty, J.H.** (2024) Conceptual Currents: Undergraduate Understandings of Ion Flux Mechanisms. Poster presented at Michigan Physiological Society Annual Meeting.

Cole, E.*, **Doherty, J.H.** (2024) From Classroom to Concept: Exploring Student Perceptions of Physiology's Core Concepts. Poster presented at Michigan Physiological Society Annual Meeting.

VanDerSlik, A.*, **Doherty, J.H.** (2024) Conceptual Currents: Undergraduate Understandings of Ion Flux Mechanisms. Poster presented at MSU UURAF.

Cole, E.*, **Doherty, J.H.** (2024) From Classroom to Concept: Exploring Student Perceptions of Physiology's Core Concepts. Poster presented at MSU UURAF.

Doherty, J.H., Todd, K. A.*, Cherniawsky, J.*, VanDerSlik, A.*, Cole, E.* (2024). Principles support mechanistic reasoning in Physiology. Poster presented at American Physiological Summit, Long Beach CA.

Todd, K. A.*, Cherniawsky, J.*, VanDerSlik, A.*, Cole, E.*, **Doherty, J.H.** (2023). Principles support mechanistic reasoning in Biology. Poster presented at MSU Department of Physiology Retreat, East Lansing, MI.

Todd, K. A.*, Cherniawsky, J.*, VanDerSlik, A.*, Cole, E.*, **Doherty, J.H.** (2023). Principles support mechanistic reasoning in Biology. Poster presented at SABER Meeting, Minneapolis, MN.

Liepkalns, J.S. & **Doherty, J.H.** (2023) Concept-Based Learning in Immunology & Microbiology (CLIMb): A Reasoning Framework for Immunology Concepts needed for the Understanding of Vaccine immunotherapies. Poster presented at SABER Meeting, Minneapolis, MN.

Doherty, J.H., Cerchiara, J.A.^, Scott, E.E.^, Jescovitch, L.N., Mcfarland, J., Haudek, K.C., & Wenderoth, M.P. (2023) Oaks to arteries: The Physiology Core Concept of "flow down gradients" supports transfer of student reasoning. Poster presented at American Physiological Summit, Long Beach CA.

Demercurio, M.*, Stosio, M.*, Wiacek, K.*, Yang, T.*, **Doherty, J.H.** (2023) Say What?! How group engagement impacts level of reasoning in response to complex questions MSU UURAF.

Denny, K.*, Gollapalli, I., Mehta, T.*, Tadian, S.*, **Doherty, J.H.** (2023) How do students reason about Ca++ accumulation during muscle contraction?. MSU UURAF.

Kam, Z.*, Parker, J*, Shah, M., Vieregge, J.*, **Doherty, J.H.** (2023) Diffusion Reasoning Consistency among Undergraduate Students. MUS UURAF

Bender, H.*, Duong, K.*, Laoprasert, M.*, Saroyan, A.*, Taneja, P.*, Eco, S.*, Dreyer, E.*, **Doherty, J.H.**, & Liepkalns, J.S. (2023) Concept-based Learning in Immunology & Microbiology (CLIMb): A Reasoning Framework for the Biology of Vaccines and Key Immunological Concepts. Poster presented at SABER West Meeting, Long Beach, CA.

Doherty, J.H. (2022) What are your students thinking about ion flux? Presented at MSU Department of Physiology Retreat,, Michigan State University, East Lansing, MI.

Doherty, J.H., Cerchiara, J.A.^, Scott, E.E.^, Jescovitch, L.N., Mcfarland, J., Haudek, K.C., & Wenderoth, M.P. (2022) The Prinicple of "flow down gradients" supports transfer of student reasoning. Poster presented at X-DBER Virtual Meeting.

Jafry, S.*, Chen, J-T. * & Doherty, J.H. (2022). The Effectiveness of Autopausing to Elicit Active Learning. UW Undergraduate Research Symposium.

Jafry, S.* & Doherty, J.H. (2021). Effectiveness of Autopausing Asynchronous Videos to Elicit Active Learning. Roundtable at SABER Virtual Meeting.

Lahda, A.*, Scott, E. E.^, & Doherty, J.H. (2021). Investigating Patterns in Students' Flux Reasoning in Respiratory Physiology. Roundtable at SABER Virtual Meeting.

Gilbert, A.*, Scott, E. E.^, & Doherty, J.H. (2021). Investigating the Accuracy and Equity of Constructed-Response Computer Scoring. Roundtable at SABER West Virtual Meeting.

Jafry, S.* & Doherty, J.H. (2021). The Effectiveness of Autopause Questions in Changing Students' Approach to Classroom Questions. Roundtable at SABER West Virtual Meeting.

Kumasaka, J.*, Scott, E. E.^, & Doherty, J.H. (2021). Investigating Biases in Physiology Learning Progression Computer Models. Roundtable at SABER West Virtual Meeting.

Lahda, A.*, Scott, E. E.^, & Doherty, J.H. (2021). Using the respiratory system as a model to understand flux and animal physiology. Roundtable at SABER West Virtual Meeting.

Moghadasi, A.*, Scott, E. E.^, & Doherty, J.H. (2021). Investigating Patterns in Student Flux Reasoning. Roundtable at SABER West Virtual Meeting.

Jackson, M.A., Moon, S.^, **Doherty, J.H.**, Wenderoth, M.P. (2020). A CAUSE for change: Exploring faculty adoption of evidence-based teaching. Poster presented at SABER West Conference, Irvine, CA.

Jescovitch, L. N.^, **Doherty, J. H.,** Merrill, J. E., Urban-Lurain, M., & Haudek, K. C. (2019). Developing a learning progression for flux in physiology and aligned automated assessment tools. Poster presented at the Conference for Student Learning and Success, MSU, East Lansing, MI.

Wenderoth, M. P., Scott, E. E.^, Cerchiara, J. A.^, McFarland, J. L., & **Doherty, J. H.** (2019). Developing learning progressions in undergraduate physiology. Poster presented at the Experimental Biology, Orlando, FL.

Wenderoth, M. P., Scott, E. E.^, Cerchiara, J. A.^, McFarland, J. L., & **Doherty, J. H.** (2019). Developing learning progressions in undergraduate physiology. Poster presented at the PMIG, Minneapolis, MN.

Scott, E. E.^, Cerchiara, J. A^., McFarland, J. L., Wenderoth, M. P., & **Doherty, J. H.** (2019). Developing learning progressions in animal physiology. Poster presented at the UW Symposium on Teaching and Learning, Seattle, WA.

Cerchiara, J. A.^, Scott, E. E.^, McFarland, J. L., Wenderoth, M. P., & **Doherty, J. H.** (2019). Oaks to Arteries: Principle-based Reasoning Varies with Physiological Context. Poster presented at the UW Symposium on Teaching and Learning, Seattle, WA.

Cerchiara, J. A.^, Scott, E. E.^, McFarland, J. L., Wenderoth, M. P., & **Doherty, J. H.** (2019). Oaks to Arteries: Principle-based Reasoning Varies with Physiological Context. Poster presented at the HAPS, Portland, OR.

Reid*, A., Day*, B., Scott, E.E., Cerchiara, J.A., Wenderoth, MP & **Doherty, J.H.** May 2018. How Biology Students Think About Cardiovascular Pressure Gradients and Flux. University of Washington Teaching & Learning Symposium, Seattle, WA.

Serna*, B.E., Mallen*, M., & **Doherty, J.H.** May 2018. Characteristics of In-class Questions Impact the Quality of Student Reasoning. University of Washington Teaching & Learning Symposium, Seattle, WA.

Oli*, N., Moorleghen*, D., Crowe, A., Leipkalns, J., Self, C. & **Doherty, J.H.** May 2018. Cellphones as a Classroom Tool: Swipe Right or Left? University of Washington Teaching & Learning Symposium, Seattle, WA.

Kolpikova*, E., Chen*, D., & **Doherty, J.H.** May 2018. Adaptive Learning Quizzes Show no Impact on Student Learning. University of Washington Teaching & Learning Symposium, Seattle, WA.

Chen*, D., Kolpikova *, E., & **Doherty, J.H.** May 2018. In Active Learning Environments, Student Demographics Affect Random Call Participation. University of Washington Teaching & Learning Symposium, Seattle, WA.

Farrell*, S., Wenderoth, M.P., & Doherty, J.H. May 2017. The Key to Successful Problem Solving: Identifying Keywords! University of Washington Teaching & Learning Symposium, Seattle, WA.

Salahuddin*, O., Wenderoth, M.P., & **Doherty, J.H.** May 2017. Studying Resources of Undergraduate Students in Introductory Biology. University of Washington Teaching & Learning Symposium, Seattle, WA.

Jackson*, M., Tran*, A., Wenderoth, M.P., & **Doherty, J.H.** May 2017. Self- Versus Peer-Grading of Practice Exams: Which is Better? University of Washington Teaching & Learning Symposium, Seattle, WA.

Doherty, J.H., Wenderoth, M.P., Urban -Lurain, M., Merrill, J., McFarland, J., Haudek, K.C. May 2017. Developing Learning Progressions in Undergraduate Physiology (LeaP UP). Human Anatomy and Physiology Conference, Salt Lake City, UT.

Doherty, J.H., Wenderoth, M.P., Urban -Lurain, M., Merrill, J., McFarland, J., & Haudek, K.C. 2017. Developing Learning Progressions in Undergraduate Physiology (LeaP UP). Pearson Biology Leadership Conference, Tucson, AZ.

Doherty, J.H. & Wenderoth, M.P. 2016. A Novel Pathway to Expertise in Physiology. University of Washington Teaching & Learning Symposium, Seattle, WA.

Doherty, J.H. & Wyner, Y. 2016. Student Learning of Local Tree Diversity and Common Ancestry. University of Washington Teaching & Learning Symposium, Seattle, WA.

Draney, K., **Doherty, J.H.**, Anderson, C.W. & Kim, J. 2016. What We've Learned About Learning Progressions, Items, and Scoring Guides From Using Item Response Models. Paper presented at the Annual Meeting of the American Educational Research Association, Washington, D.C.

Moore, J.C., Anderson, C.W., Berkowitz, A.R., Covitt, B., Gunkel, K., Hartley, L.M., **Doherty, J.H.**, Jin, H., Johnson, M., Hauk, S., Pressler, Y., & Yestness, N. 2015. Defining Common Elements of Environmental Science Literacy Learning Progressions: Implications for Research and Teaching. Presented at the annual meeting of the NARST, Chicago, IL

Wyner, Y. & **Doherty, J.H.** 2015. Urban Middle School Student Learning of Local Tree Diversity & Common Ancestry. Presented at the annual meeting of the NARST, Chicago, IL.

Hartley, L.M., **Doherty, J.H.**, Harris, C., Moore, J.C., Berkowitz, A.R., & Anderson, C.W. 2015. A Learning Progression-based Biodiversity Teaching Unit: Investigating the impact of Teacher Knowledge and Implementation Fidelity on Student Learning. Presented at the annual meeting of the NARST, Chicago, IL.

Doherty, J.H., Hartley, L.M., Harris, C., Anderson, C.W., Berkowitz, A., & Moore, J.C. 2013. Using learning progressions to describe how students develop increasingly sophisticated understandings of biodiversity. 98th ESA Annual Meeting. Minneapolis, MN.

Anderson, C.W., Dauer, J.M., & **Doherty, J.H.** 2013. Learning progression theory: Background and application to ecology teaching and learning. 98th ESA Annual Meeting. Minneapolis, MN.

Doherty, J.H., Rice, J., & Anderson, C.W. 2013. Principles, First and Foremost: A Tool for Understanding and Teaching Biological Processes. 3rd Annual Meeting of the Society for the Advancement of Biology Education Research, Minneapolis, MN.

Rice, J., Markham, L., Jackson, S., Wilson, D., Maldonado, P., **Doherty, J.H.**, & Anderson, C.W. 2012. Integrating science for preservice elementary teachers through foundational big ideas. 244th American Chemical Society National Meeting & Exposition. Philadelphia, PA.

Dauer, J.M., **Doherty, J.H.**, Covitt, B.A., Gallagher, D., & Anderson, C.W. 2012. Carbon TIME Project: Inquiry activities and learning progression. 97th ESA Annual Meeting. Portland, OR.

Doherty, J.H., Schramm, J.W., & Anderson, C.W. 2011. The Role of Heredity and Environment in Students' Accounts of Adaptation by Selection and Phenotypic Plasticity. 1st Annual Meeting of the Society for the Advancement of Biology Education Research, Minneapolis, MN.

Anderson, C.W., D'Avanzo, C., Hartley, L.M., Pelaez, N., **Doherty, J.H.,** Schramm, J. W., & Wilke, B., A. 2011. Faculty Development Model for Transforming Introductory Biology Courses. 1st Annual Meeting of the Society for the Advancement of Biology Education Research, Minneapolis, MN.

Schramm, J.W., **Doherty, J. H**., & Anderson, C. W. 2011. Building principled reasoning in biology and ecology courses: a diagnostic question cluster approach. 1st Annual Meeting of the Society for the Advancement of Biology Education Research, Minneapolis, MN.

Newmiller, R.E. #, **Doherty, J. H.** & Casper, B. B. 2008. Attack of the Native: Evaluating How the Expanding *Smilax rotundifolia* Affects a Grassland Microbial Soil Community as Measured by the Growth of *Schizachyrium scoparium*. 93rd ESA Annual Meeting. Milwaukee, WI. #High School Student

Doherty, J. H. & Casper, B. B. 2008. Investigating the Maintenance of Arbuscular Mycorrhizal Fungal Communities. Sixth International Conference on Serpentine Ecology. Bar Harbor, ME.

Leinhauser, J. #, **Doherty, J. H.**, Bentivenga, S., & Casper, B. B. 2008. Arbuscular Mycorrhizal Fungal Communities Across a Heavy Metal Contamination Gradient and their Relationships with Indigenous *Deschampsia flexuosa*. 93rd ESA Annual Meeting. Milwaukee, WI. #High School Student

Doherty, J. H.* & Spindler, L. H.* 2006. Teaching evolution by natural selection through a hands-on simulation. 91st ESA Annual Meeting. Memphis, TN. *These authors contributed equally

Ji, B., **Doherty, J. H.**, Bentivenga, S., & Casper, B. B. 2005. Arbuscular Mycorrhizal Fungi Associated with the Same Grasses in Eastern Serpentine Grasslands and Midwestern Prairies. 90th ESA Annual Meeting. Montréal, Canada.

Doherty, J.H., Rundel, P. W., & Nobel, P.S. 2004. Soil Water Movement Around a Rock is Dependent on Soil Texture. 89th ESA Annual Meeting. Portland, OR.

Doherty, J. H. & Casper, B. B. 2000. The Effects of Nutrient Heterogeneity on Root Allocation in *Pisum sativum*: A Split-Root Experiment. 85th ESA Annual Meeting. Snowbird, UT.