

## Erin L. Dolan (Peckol)

### EDUCATION

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**Ph.D.** Neuroscience, University of California, San Francisco (1999)

**B.A.** Biology, Wellesley College, Wellesley, MA (1993)

### PROFESSIONAL APPOINTMENTS

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- **Georgia Athletic Association Professor of Innovative Science Education**, 2016-present, Department of Biochemistry & Molecular Biology, University of Georgia. **Adjunct Professor**, Department of Math and Science Education, University of Georgia.
- **Executive Director, Texas Institute for Discovery Education in Science (TIDES)**, 2014-2016, College of Natural Sciences, University of Texas at Austin. Responsibilities include establishing mission and vision for innovating teaching across the college; developing strategies and tactics to catalyze, support, and showcase innovative and evidence-based undergraduate education; and conceiving and conducting studies to determine effectiveness and impact of education programming, and understand causal mechanisms of effective student and faculty programs.
- **Associate Professor and Senior Scholar in Biology Education**, 2011-2014, Department of Biochemistry and Molecular Biology, Division of Biological Sciences, **Adjunct Associate Professor**, Department of Math and Science Education, University of Georgia.
- **Associate Professor**, 2009-2011, **Assistant Professor**, 2005-2009, Department of Biochemistry, **Adjunct Assistant Professor**, 2007-2011, Department of Agricultural and Extension Education, Virginia Tech.
- **Outreach Director**, 2002-2011, Fralin Life Science Institute, Virginia Tech.
- **Director**, 1999-2001, BIOTECH Project, University of Arizona.

### RECENT HIGHLIGHTS

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- Member, National Academies of Science, Engineering, and Medicine Consensus Committee on The Science of Effective Mentoring in Science, Technology, Engineering, Medicine, and Mathematics (STEMM)
- Member, National Academies of Science, Engineering, and Medicine Board on Science Education Roundtable on Systemic Change in Undergraduate STEM Education
- Member, Organizing Committee, Participatory Workshop on Effective Mentoring in STEMM, Board on Higher Education and Workforce, National Academies of Sciences, Engineering, and Medicine (2017)
- Chair-elect, Gordon Research Conference on Undergraduate Biology Education Research (2021 meeting).
- Editor-in-chief (2010-present), Editorial Board member (2003-present), *CBE - Life Science Education*, an online journal of the American Society for Cell Biology. Former author of the feature, *Current Insights: Recent Research in Science Teaching and Learning*, which has been recognized as a “journal feature worth noting” in the widely read *The Teaching Professor Blog*.
- Co-chair, Education Committee, American Society for Cell Biology, 2018-2020.

## TEACHING AND COURSE DESIGN EXPERIENCE

- **Principles of Biology I (BIOL 1107)**, Three-credit, freshman-level biology course for life science majors. University of Georgia, 2017 (enrollment: 260) and 2018 (enrollment: 140).
- **Introduction to Biochemistry (BCMB/BIOL/CHEM 3100)**, Four-credit junior-level biochemistry course for life science majors. University of Georgia, 2017. Enrollment: 50.
- **Introduction to Biochemistry (BCMB/BIOL/CHEM 3100)**, Four-credit junior-level biochemistry course for life science majors. University of Georgia, 2012-2014. Enrollment: 200
- **Teaching Seminar (GRSC 7770)**, One-credit course for life science graduate students on teaching and learning. University of Georgia, 2013. Enrollment: 6
- **Concepts in Biology (BIOL 1103)**, Three-credit introductory biology course for non-majors. University of Georgia, 2012-2013. Enrollment: 650
- **Independent Research (BCMB 4960 / 4970)**, Advisor for undergraduates conducting education research for credit. University of Georgia, 2011-2014, 2017. Enrollment: 11 total
- **Biotechnology Applications (BCHM/BIOL 4784)**, Three-credit capstone course in biotechnology. Virginia Tech, 2006-2008, 2010-2011. Enrollment: 40
- **Introduction to Biochemistry (BCHM 1014)**, One-credit first-year course for biochemistry majors. Virginia Tech, 2008-2010. Enrollment: 150
- **Contemporary Pedagogy (GRAD 5114)**, Three-credit, cross-disciplinary course on pedagogy for graduate students. Virginia Tech, 2005.
- **Graduate Course in Neuroscience for Teachers**, Three-credit course on neuroscience and its implications for classroom practice. University of Arizona, 2000.
- **Graduate Topics in Biology Teaching: Brain Biology**, One-credit course for teachers on teaching about nervous system structure and function. University of Arizona, 1999.
- **Undergraduate Course on K-12 Outreach: Science Connection** University of Arizona, 2000.
- **Genes and Behavior** California Academy of Sciences, Adult Education Program, San Francisco, 1998.
- **Neuroscience for Pharmacy Students** University of California at San Francisco, 1995-1998.

## FACULTY PROFESSIONAL DEVELOPMENT EXPERIENCE

- Designer and sole facilitator, *Course-based Undergraduate Research Experiences (CURE) Summer Institute*. Santa Rosa Junior College (four days, 2017), University of West Alabama (two days, 2017), Hampton University (three days, 2018), Mercy College (three days, 2018).
- Lead designer and facilitator, *National Academies Special Topics Summer Institute on Course-based Undergraduate Research Experiences* (four days), University of Texas Austin (2016, 2017).
- Lead designer and facilitator, *College of Natural Sciences Scientific Teaching Institute* (2.5 days) University of Texas Austin (2016).
- Designer and sole facilitator, *New Faculty Teaching Orientation* (six hours) College of Natural Sciences, University of Texas Austin (2015, 2016).
- Designer and sole facilitator of monthly, college-wide professional development workshops (two hours each), *Scientific Teaching Workshop Series*, University of Texas Austin (2014-2016).
- Workshop facilitator, *Course-based Undergraduate Research Experiences Workshop* (two hours). San Francisco State University, CA, 2016.

- *Publishing your STEM education scholarship workshop* (two hours). Southwestern University, Georgetown, TX, 2016.
- *Publishing your STEM education scholarship workshop* (two hours). University of California at San Diego, CA, 2016.
- Designer and sole facilitator, *Course-based Undergraduate Research Experiences Workshop* (six hours). Carleton College, Northfield, MN, 2015.
- Designer and sole facilitator, *What you can do right now to improve student learning workshop* (six hours) Tarrant County College System, Ft. Worth, TX, 2015.
- Plenary speaker, *Undergraduate biology education – The view from 20,000 feet*. National Association of Biology Teachers Four-Year College & University Professional Development Symposium, Cleveland, OH, 2014.
- Plenary speaker and Assessment workshop facilitator, *Course-based Research Experiences Workshop*, Smith College, MA, 2014.
- Plenary speaker, *The 20,000-foot view of undergraduate science education – What we know and what we can do about it*. Southeast Regional PULSE Institute, Richmond, VA, 2014.
- Workshop facilitator, *How do you know it works? From objectives to assessment*. Mimulus Community Meeting, Duke University, NC, 2014.
- Workshop facilitator, *Integrating Research into Teaching*. Oxford College of Emory, Atlanta, GA, 2014.
- Workshop facilitator, *Publishing Your Biology Education Scholarship*. IRACDA Conference – Increasing Diversity in Science: From Bench to Classroom, Atlanta, GA, 2013.
- Facilitator, *Transformation Session*, National Academies Southeast Regional Summer Institute on Undergraduate Education, University of Georgia, Athens, GA, 2013.
- Panelist, *Disseminating Outcomes*. HHMI Undergraduate Science Education Principal Investigators Meeting, Chevy Chase, MD, 2012.
- Co-leader, *Transition to Writing Residency*, NSF-funded Biology Scholars Program, American Society for Microbiology, Washington DC, 2009-2012.
- Workshop facilitator, *Talking Science in Public: Evolution, GMOs, and other challenging topics*. Plant Biology 2009 Meeting, Honolulu, HI.
- Workshop facilitator, *Biology Education Scholarship*, Student Centered Education Conference of the American Society for Biochemistry and Molecular Biology, Colorado Springs, CO, 2009.
- Workshop facilitator, *Evaluation, Assessment, and Research in Life Science Education: What, How, and Why?* Plant Biology 2008 Meeting, Merida, Mexico.

## OTHER LEADERSHIP EXPERIENCE

- Advisor (2014-present) for the Community College Undergraduate Research Initiative, which aims to promote widespread involvement of community college students in science inquiry and research.
- Steering committee member, advisory board member, or invited participant in multiple NSF-funded Research Coordination Networks for Undergraduate Biology Education.
- Advisory board member (2012-2017), *CourseSource*, a Journal of Biology Curriculum Resources being developed with support from the HHMI.

- Advisor (2012-2017) for the Partnership for Undergraduate Life Science Education (PULSE), a joint effort of NSF, NIH, and the Howard Hughes Medical Institute (HHMI) to promote widespread use of evidence-based teaching in undergraduate biology education.
- Co-leader of emerging alliance to interdisciplinary research among discipline-based education researchers (2016), supported by the Association of Public and Land-grant Universities and the Howard Hughes Medical Institute.
- Invited participant in meeting at the National Science Foundation on the intersection of cognitive science and discipline-based education research (2016).
- Invited participant in inaugural Education FOO at Google (2016).
- Co-chair of 21<sup>st</sup> Century Undergraduate Education Working Group at the University of Texas Austin, 2015-2016.
- Member, Organizing Committee, National Academy of Sciences National Research Council Convocation on Integrating Discovery-Based Research into the Undergraduate Curriculum (2015)
- Chair (2009-2012) and member (2007-2014), Education Committee, American Society of Plant Biologists. Spearheaded development of the Core Concepts and Learning Objectives in Plant Biology for Undergraduates and initiated the Master Educator Program.
- Chair / Co-chair of three searches to hire tenure-track biology education faculty at the University of Georgia, 2012-2014.
- Co-chair of museum-university partnership taskforce (2010), which identified ways for Virginia Tech and the Science Museum of Western Virginia to collaborate.
- One of eight faculty on campus to serve as a member of Virginia Tech's Interdisciplinary Scholars for Emerging Frontiers in the Life Sciences, a university-wide initiative to identify frontiers for interdisciplinary graduate research and education in the life sciences (2010).
- Invited keynote speaker (2009) representing "S" in STEM education during Virginia Governor's Conference on STEM Education.
- President, National Association for Health & Science Education Partnerships, 2006-2008; Executive Board, 2004-2008.
- Appointed by Virginia Tech's Office of the Vice Provost for Outreach to serve as the first director of VT-STEM, Virginia Tech's university-wide initiative for science, technology, engineering, and mathematics K-12 education and outreach (2004-2006).
- Formal and informal mentorship of and collaboration with 50+ faculty to broaden impact of their research through K-12, undergraduate, and graduate education as part of their NSF proposals (2003-present).
- Principal investigator of the National Institutes of Health (NIH)-funded Partnership for Research and Education in Plants (PREP) and National Science Foundation (NSF)-funded PREP for Undergraduates (PREP-U). PREP has been recognized as an exemplary model of laboratory education by the Center for Excellence in Education and featured in the National Research Council report, *Achievements of the National Plant Genome Initiative and New Horizons in Plant Biology* (2008) as a program with which scientists should "join forces" to have a "national impact on high school education."

## PUBLICATIONS

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**Journal Articles on Education Research and Practice:** (\* indicates postdoctoral researcher, \*\* indicates graduate researcher, + indicates undergraduate researcher)

1. Corwin\*, L.A., Runyon, C.R., Ghanem, E., Sandy, M., Clark, G., Palmer, G.C., Reichler, S., Rodenbusch, S.E., and Dolan, E.L. (in press) Effects of Discovery, Iteration, and Collaboration in Laboratory Courses on Undergraduates' Research Career Intentions Fully Mediated by Student Ownership. *CBE Life Sci Educ*.
2. Walcott, R. L., Corso, P. S., Rodenbusch, S. E., & Dolan, E. L. (2018). Benefit–Cost Analysis of Undergraduate Education Programs: An Example Analysis of the Freshman Research Initiative. *CBE Life Sci Educ* 17(1), rm1.
3. Dolan, E. L., Elliott, S. L., Henderson, C., Curran-Everett, D., John, K. S., & Ortiz, P. A. (2018). Evaluating discipline-based education research for promotion and tenure. *Innovative Higher Education* 43(1), 31-39.
4. Henderson, C., Connolly, M., Dolan, E. L., Finkelstein, N., Franklin, S., Malcom, S., ... John, K. S. (2017). Towards the STEM DBER Alliance: Why We Need a Discipline-Based STEM Education Research Community. *Journal of Engineering Education* 106(3), 349–355.  
<https://doi.org/10.1002/jee.20168>
5. Alford, R. F., Leaver-Fay, A., Gonzales, L., Dolan, E. L., & Gray, J. J. (2017). A cyber-linked undergraduate research experience in computational biomolecular structure prediction and design. *PLoS Computational Biology* 13(12), e1005837.
6. Wachsmuth+, L.P., Runyon\*\*, C.R., Drake, J.M., and Dolan, E.L. (2017). Do Biology Students Really Hate Math? Empirical Insights into Undergraduate Life Science Majors' Emotions about Mathematics. *CBE Life Sci Educ* 16, ar49.
7. Aikens\*, M.L., Robertson\*\*, M.M., Sadselia+, S., Watkins+, K., Evans\*, M., Runyon\*\*, C.R., Eby, L.T., and Dolan, E.L. (2017). Race and Gender Differences in Undergraduate Research Mentoring Structures and Research Outcomes. *CBE Life Sci Educ* 16, ar34.
8. Schinske, J.N., Balke, V.L., Bangera, M.G., Bonney, K.M., Brownell, S.E., Carter, R.S., Curran-Everett, D., Dolan, E.L., Elliott, S.L., Fletcher, L. Gonzalez, B., Gorga, J.J., Hewlett, J.A., Kiser, S.L., McFarland, J.L., Misra, A., Nenortas, A., Ngeve, S.M., Pape-Lindstrom, P.A., Seidel, S.B., Tuthill, M.C., Yin, Y., Corwin, L.A. Broadening Participation in Biology Education Research: Engaging Community College Students and Faculty. *CBE Life Sci Educ*, 16(2), mr1.  
<https://doi.org/10.1187/cbe.16-10-0289>
9. Aikens\*, M.L., Sadselia+, S., Watkins+, K., Evans\*, M., Eby, L.T., and Dolan, E.L. (2016). A Social Capital Perspective on the Mentoring of Undergraduate Life Science Researchers: An Empirical Study of Undergraduate–Postgraduate–Faculty Triads. *CBE Life Sci Educ* 15, ar16.
10. Andrews\*, T.C., Conaway+, E.P., Zhao, J., and Dolan, E.L. (2016). Colleagues as Change Agents: How Department Networks and Opinion Leaders Influence Teaching at a Single Research University. *CBE Life Sci Educ* 15, ar15.
11. Rodenbusch, S.E., Hernandez, P.R., Simmons, S.L., and Dolan, E.L. (2016). Early Engagement in Course-Based Research Increases Graduation Rates and Completion of Science, Engineering, and Mathematics Degrees. *CBE Life Sci Educ* 15, ar20.
12. Thompson\*, J.J., Conaway+, E., and Dolan, E.L. (2015). Undergraduate students' development of social, cultural, and human capital in a networked research experience. *Cultural Studies Sci Educ* 1–32.
13. Corwin\*, L.A., Graham, M.J., Dolan, E.L. (2015) Modeling course-based undergraduate research experiences: an agenda for future research and evaluation. *CBE Life Sci Educ* 14, es1.

14. Corwin\*, L.A., Runyon\*\*, C., Robinson+, A., and Dolan, E.L. (2015). The Laboratory Course Assessment Survey: A Tool to Measure Three Dimensions of Research-Course Design. *CBE Life Sci Educ* 14, ar37.
15. Aikens\*, M.L., and Dolan, E.L. (2014). Teaching quantitative biology: goals, assessments, and resources. *Molecular Biology of the Cell* 25, 3478–3481.
16. Alkaher\*, I., Dolan, E. L. (2014). Integrating research into undergraduate courses: Current practices and future directions. In Sunal, D., Sunal, C. & Wright, E., Mason, C., and Zollman, D. (Eds.), *Research based undergraduate science teaching*. Charlotte, NC: Information Age Pub.
17. Corwin Auchincloss\*, L., Laursen, S. L., Branchaw, J. L., Eagan, K., Graham, M., Hanauer, D. I., Lawrie, G., McLinn, C. M., Pelaez, N., Rowland, S., Towns, M., Trautmann, N. M., Varma-Nelson, P., Weston, T. J., Dolan, E. L. (2014). Assessment of Course-Based Undergraduate Research Experiences: A meeting report. *CBE Life Sci Educ* 13(1), 29–40.
18. Hanauer, D. I., Dolan, E. L. (2014). The Project Ownership Survey: Measuring differences in scientific inquiry experiences. *CBE Life Sci Educ* 13(1), 149–58.
19. Peker\*, D., Dolan, E. L. (2014). Guiding students’ scientific practice: Distinct and common roles for teachers and scientists. *Sage OPEN*, 4(1). doi:10.1177/2158244014525413.
20. Luketic\*\*, C., Dolan, E. L. (2013). Factors influencing student perceptions of high-school science laboratory environments. *Learning Environments Research*, 16, 37-47.
21. Peker\*, D., Dolan, E. L. (2012). Helping students make meaning of authentic investigations: Findings from a student-teacher-scientist partnership. *Cultural Studies of Science Education*, 7, 223-244.
22. Alkaher\*, I., Dolan, E. L. (2011). Instructors’ decisions that integrate inquiry teaching into undergraduate courses: How do I make this fit? *International Journal for the Scholarship of Teaching and Learning*, 5, 2.
23. Brooks\*\*, E., Dolan, E. L., Tax, F. E. (2011). Partnership for Research and Education in Plants (PREP): Involving high school students in authentic research in collaboration with scientists. *American Biology Teacher*, 73, 136-140.
24. Grady\*\*, J., Dolan, E., Glasson, G. (2010). Agriscience student engagement in scientific inquiry: Representations of scientific processes and nature of science. *Journal of Agricultural Education*, 51, 10-19.
25. Dolan, E., Johnson\*, D. (2010). The undergraduate – postgraduate – faculty triad: Unique functions and tensions within a science research community of practice. *CBE Life Sci Educ*, 9, 443-453.
26. Dolan, E. L., Grady\*\*, J. (2010). Recognizing students’ scientific reasoning: A tool for categorizing the complexity of reasoning during teaching by inquiry. *Journal of Science Teacher Education*, 21, 31-55.
27. Dolan, E., Johnson\*, D. (2009). Toward a holistic view of undergraduate research experiences: An exploratory study of impact on graduate / postdoctoral mentors. *Journal of Science Education and Technology*, 18, 487-500.
28. Dolan, E. L., Lally, D. J., Brooks\*\*, E., Tax, F. E. (2008). PREPping students for authentic science. *The Science Teacher* 75: 38-43.
29. Dolan, E. L. (2007). Grappling with the literature of education research and practice. *CBE Life Sci Educ*, 6, 289-296.
30. Lally, D. J., Brooks\*\*, E., Tax, F. E., Dolan, E. L. (2007). Sowing the seeds of dialogue: Public engagement through plant science. *Plant Cell*, 19, 2311-2319.
31. Dolan, E. L., Tanner, K. D. (2005). Moving from Outreach to Partnership: Striving for Articulation and Reform across the K-20+ Science Education Continuum. *CBE Life Sci Educ*, 4, 35-37.
32. Dolan, E. L., Soots, B. E., Lemaux, P. G., Rhee, S. Y., Reiser, L. 2004. Strategies for avoiding reinventing the precollege education and outreach wheel. *Genetics*, 166, 1601-1609.

33. Doyle, H. J., Peckol, E., Tanner, K. 1998. Discover your brain with BrainLink. *CSTA Journal, Summer*, 24-29.

#### **Invited Papers, Monographs, and Book Chapters:**

1. Lunsford, L. G., Crisp, G., Dolan, E. L., & Wuetherick, B. (2017). Mentoring in higher education. *Clutterbuck D. A., Kochan F. K., Lunsford L., Dominguez N., Haddock-Millar J. (Eds.), The Sage Handbook of Mentoring*, 316-334.
2. Dolan, E. L. (2016). *Course-based Undergraduate Research Experiences: Current Knowledge and Future Directions*. Paper commissioned for the Committee on Strengthening Research Experiences for Undergraduate STEM Students. Board on Science Education, Division of Behavioral and Social Sciences and Education. Board on Life Sciences, Division of Earth and Life Studies. Retrieved from [http://nas.edu/STEM\\_Undergraduate\\_Research\\_CURE](http://nas.edu/STEM_Undergraduate_Research_CURE)
3. Eby, L. T., Dolan, E. L. (2015). Mentoring in postsecondary education and organizational settings. In *APA Handbook of Career Intervention, Volume 2: Applications*, Hartung, P. J., Savickas, M. L., (pp. 383-395). American Psychological Association: Washington DC.
4. Dolan, E. L. (2008). *Education Outreach and Public Engagement*. Springer: New York.

#### **Science Publications:**

1. Tobin, D. M., Madsen, D. M., Kahn-Kirby, A., Peckol, E. L., Moulder, G., Barstead, R., Maricq, A. V., Bargmann, C. I. (2002). Interacting TRPV genes mediate nociception and chemosensation in *C. elegans*. *Neuron*, 35, 307-318.
2. Peckol, E. L., Troemel, E., Bargmann, C. I. (2001). Sensory experience and sensory activity regulate chemosensory receptor gene expression in *Caenorhabditis elegans*. *Proceedings of the National Academy of Sciences*, 98, 11032-8.
3. Zallen, J. A., Peckol, E. L., Tobin, D. M., Bargmann, C. I. (2000). Neuronal cell shape and neuritogenesis are regulated by the Ndr kinase SAX-1, a member of the Orb6/COT-1/Warts serine/threonine kinase family. *Molecular and Cellular Biology*, 11, 3177-3190.
4. Peckol, E. L., Zallen, J. A., Yarrow, J. C., Bargmann, C. I. (1999). Sensory activity affects the development of sensory axons in *C. elegans*. *Development*, 126, 1891-1902.
5. Ganim, R. B., Peckol, E. L., Larkin, J., Ruchhoeft, M. L., Cameron, J. S. (1998). ATP-sensitive K<sup>+</sup> channels in cardiac muscle from cold-acclimated goldfish: Characterization and altered response to ATP. *Comparative Biochemistry and Physiology*, 119A, 395-401.
6. Schneider, H., Budhiraja, P., Walter, I., Beltz, B. S., Peckol, E., Kravitz, E. A. (1996). Developmental expression of the octopamine phenotype in lobsters, *H. americanus*. *Journal of Comparative Neurology*, 371, 3-14.
7. Maricq, A. V., Peckol, E., Driscoll, M., Bargmann, C. I. (1995). Mechanosensory signalling in *C. elegans* mediated by the GLR-1 glutamate receptor. *Nature*, 378, 78-81.

**Conference Papers:** (\* indicates postdoctoral researcher, \*\* indicates graduate researcher, + indicates undergraduate researcher)

1. Morosky\*\*, K. D., Dolan, E. L. (2017). The science research resource generator: Undergraduates' perceptions of their social capital in securing a research apprenticeship. Paper presented at the annual meeting of the National Association for Research in Science Teaching (San Antonio, TX, April 22-25).
2. Aikens\*, M. L., Dolan, E. L. (2015). Examining mentoring of undergraduate science researchers in undergraduate-postgraduate-faculty triads. Paper presented at the National Association for Research in

Science Teaching Annual Conference (Chicago, IL, April 11-15).

3. Thomsson\*, J. J., Glisson+, B., Dolan, E. L. (2012). Mentors, friends, and co-workers: An analysis of emerging network ties and social capital in an undergraduate research network. Paper presented at the American Anthropological Association Annual Meeting (San Francisco, CA, November 13-18).
4. Alkahrer\*, I., Dolan, E. (2010). The nature of undergraduate students' questions during inquiry. Paper presented at the National Association for Research in Science Teaching Annual Conference (Philadelphia, PA, March 21-24).
5. Alkahrer\*, I., Dolan, E. (2010). Covering the content? How undergraduate instructors make decisions as they integrate inquiry into their curricula. Paper presented at the Association for Science Teacher Education annual conference (Sacramento, CA, January 13-16).
6. Grady\*\*, J. R., Dolan, E. L., Glasson, G. (2009). Representations of the processes and nature of science: Scientific inquiry in an agricultural science classroom. Paper presented at the National Association for Research in Science Teaching Annual Conference (Garden Grove, CA, April 16-21).
7. Johnson\*, D., Dolan, E. L. (2008). The impact of undergraduate research experiences on the graduate student/postdoctoral fellow mentor. Paper presented at the National Association for Research in Science Teaching Annual Conference (Baltimore, MD, March 30-April 2).
8. Luketic\*\*, C. D., Wolfe, E. W., Singh, K., Dolan, E. (2008). Assessing Student Perceptions of High School Science Laboratories: A Validation Study. Paper presented at the International Objective Measurement Workshop (New York, NY, March 22).
9. Dolan, E. L., Grady\*\*, J., Lally, D. (2007). Defining authenticity within a student-teacher-scientist partnership. Paper presented at the National Association for Research in Science Teaching Annual Conference (New Orleans, LA, April 15-18).
10. Dolan, E. L. (2006). Student-teacher-scientist partnerships: Experimental biology in K-12 classrooms. Proceedings of Experimental Biology 2006, American Society for Biochemistry and Molecular Biology (San Francisco, CA, April 1-5, 2006). *FASEB Journal* 20, A1311.
11. Dolan, E. L. (2004). Sustaining Biotechnology Education: Challenges and Strategies. Paper for Conference on K-12 Outreach from University Science Departments, Raleigh NC.
12. Dolan, E. L. (2003). Partnership for Research & Education in Plants: A teacher-student-scientist collaboration. Paper for Conference on K-12 Outreach from University Science Departments, Raleigh NC.

### Reviews, Editorials, and Features:

1. Dolan, E. L. (2017). Within and beyond Biology Education Research: Steps toward Cross-Disciplinary Collaboration. *CBE-Life Sciences Education*, 16(4), ed2. <https://doi.org/10.1187/cbe.17-10-0224>
2. Dolan, E. L. (2017). Sustaining CBE—Life Sciences Education. *CBE-Life Sciences Education*, 16(3), ed1. <https://doi.org/10.1187/cbe.17-07-0120>
3. Dolan, E. L. (2017). Undergraduate research as curriculum. *Biochemistry and Molecular Biology Education* 45(4), 293–298. <https://doi.org/10.1002/bmb.21070>
4. Dolan, E. (2015). Best practices for digital teaching. *Science* 348, 1436–1436.
5. Dolan, E.L. (2015). Biology Education Research 2.0. *CBE – Life Sciences Education* 14, ed1.
6. Dolan, E. L. (2014). Thanks! *CBE – Life Sciences Education*, 13, 573-574.
7. Dolan, E. L. (2013). A year of firsts. *CBE – Life Sciences Education*, 12, 577-578.
8. Dolan, E. L., Stone, E. (2013). Adding to the biology education research toolkit: Research Methods essays. *CBE – Life Sciences Education*, 12, 318-319.



9. Dolan, E. L. (2012). Biology education research—A cultural (r)evolution. *CBE – Life Sciences Education*, 11, 333-334. [<http://www.lifescied.org/content/11/4/333.full>]
10. Dolan, E. L. (2012). Next steps for Vision and Change: Moving from setting the vision to change. *CBE – Life Sciences Education*, 11, 201-202. [<http://www.lifescied.org/content/11/3/201.full>]
11. Dolan, E. L. (2011). The blossoming of biology education research. *CBE – Life Sciences Education*, 10, Highlights of 2011, 1-2. [<http://www.ascb.org/files/2011-Editorial.pdf>]
12. Ledbetter, M. L., Dolan, E. L. (2011). Book Review. Discipline-based education research: Preaching to converts who are learning to sing in the choir. *CBE – Life Sciences Education*, 10, 142-143. [<http://www.lifescied.org/content/10/2/142.full>]
13. Dolan, E. L. (2010). The next five years. *CBE – Life Sciences Education*, 9, 379-380. [<http://www.lifescied.org/cgi/content/full/9/4/379>]
14. Dolan, E. L. Current insights: Recent research in science teaching and learning. *CBE – Life Sciences Education*.
  - i. Volume 9: 148-149. [<http://www.lifescied.org/cgi/content/full/9/3/148>]
  - ii. Volume 9: 76-77. [<http://www.lifescied.org/cgi/content/full/9/2/76>]
  - iii. Volume 9: 17-18. [<http://www.lifescied.org/cgi/content/full/9/1/17>]
  - iv. Volume 8: 274-275. [<http://www.lifescied.org/cgi/content/full/8/4/274>]
  - v. Volume 8: 162-164. [<http://www.lifescied.org/cgi/content/full/8/3/162>]
  - vi. Volume 8: 108-110. [<http://www.lifescied.org/cgi/content/full/8/2/108>]
  - vii. Volume 8: 9-10. [<http://www.lifescied.org/cgi/content/full/8/1/9>]
  - viii. Volume 7: 353-354. [<http://www.lifescied.org/cgi/content/full/7/4/353>]
  - ix. Volume 7: 288-289. [<http://www.lifescied.org/cgi/content/full/7/3/288>]
  - x. Volume 7: 171-172. [<http://www.lifescied.org/cgi/content/full/7/2/171>]
  - xi. Volume 7: 25-26. [<http://www.lifescied.org/cgi/content/full/7/1/25>]
  - xii. Volume 6: 259. [<http://www.lifescied.org/cgi/content/full/6/4/259>]

## GRANTS, FELLOWSHIPS, AND AWARDS

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### **Grants – Active**

- PI, Course-based Undergraduate Research Experiences Network 2. NSF Research Coordination Networks in Undergraduate Biology Education, 2017-2020, \$499,925.
- Co-PI, Collaborative proposal: Dimensions: Molecular, ecological, and evolutionary dynamics of carbon fixation and diversification in Agavoideae (Asparagaceae) and Oncidiinae (Orchidaceae). NSF Division of Environmental Biology, 2015-2018, \$1,521,281 total (my portion of the budget: \$63,310).

### **Grants – Pending**

- Co-PI, Post-Baccalaureate Training in Infectious Disease Research. NIH Post-baccalaureate Research Education Program (R25), \$2,124,910 requested.
- PI, The Role of Undergraduate Research in Career Development. NSF EHR Core Research Program, \$1,499,960 requested.

## Grants – Completed

- PI, Vertically Integrated Projects (VIP) at UGA. Subcontract from Georgia Tech as part of a grant from the Helmsley Foundation, \$49,801.
- PI, Examining the mentoring of undergraduates engaged in science research: An empirical study of undergraduate-postgraduate-faculty triads. NSF Research and Evaluation on Education in Science and Engineering, 2013-2017, \$382,213.
- PI, Moving the Needle: Applying successful strategies to improve persistence across the spectrum of STEM students, HHMI Undergraduate Science Education Award Program, 2014-2019, \$2,400,000. *Stepped down in 2016 with institutional transition.*
- Co-PI, Enhancing experiential learning with technology educators, Keck Foundation, 2015-2018, \$500,000. *Stepped down in 2016 with institutional transition.*
- PI, RCN-UBE: Course-based undergraduate research experiences network (CUREnet), NSF Research Coordination Network for Undergraduate Biology Education Program, 2011-2016, \$497,556.
- PI, Building an Infrastructure for Research Collaborations, NIH National Center for Research Resources - Science Education Partnership Award, 2009-2016, \$1,281,896.
- PI, Community College Biology Education Research Meeting, NSF Improving Undergraduate STEM Education Program, 2015-2016, \$49,321.
- PI, REU Site: Undergraduate Biology Education Research Program, NSF Research Experiences for Undergraduates Program, 2013-2016, \$260,236. *Stepped down as PI in 2014 with institutional transition.*
- PI, Collaborative: Engaging undergraduates in genomic questions and environmental context: Building a database of complex phenotypes for plant knockout mutants, NSF Integrated Organismal Systems Program, 2011-2015, \$202,505.
- Co-PI, Transforming Undergraduate Education in STEM – Central Resource Project: A Scientific Society's Response to the Vision and Change Report, NSF Division of Undergraduate Education, 2011-2013, \$19,000.
- Co-PI, Sciencering: Learning, Discovery and Engagement at the Intersections of Science, Engineering, and Law, HHMI Undergraduate Science Education Award Program, 2010-2014, \$1,330,000. *Stepped down as co-PI in 2011 with institutional transition.*
- Collaborator, Biology Education Network Collaborative, American Association for the Advancement of Science (AAAS), 2005-2010, \$146,003.
- PI, Expanding the Web of Partnership: teaching cutting-edge plant science through web-based Flash modules, American Society of Plant Biologists Education Foundation Grant Awards Program, 2007-2009, \$28,369.
- PI, Partnership for Research and Education in Plants, NIH National Center for Research Resources - Science Education Partnership Award, 2003-2009, \$1,482,150.
- PI, Integrating Biology Learning through Investigation, NSF Division of Undergraduate Education, Course, Curriculum, and Lab Improvement, 2007-2010, \$200,000.
- Co-PI, 2010 Project: Analysis of Four Families of Receptor Protein Kinases, NSF Department of Biological Infrastructure, 2004-2009, \$312,824.
- Co-PI, Structure and Localization of the Flavonoid Multienzyme Complex, NSF Division of Molecular and Cellular Biosciences, Metabolic Biochemistry, 2005-2009, \$49,697.

- PI, SEPA Web Site (administrative supplement to Partnership for Research and Education in Plants), NIH National Center for Research Resources - Science Education Partnership Award, 2004-2008, \$207,018.
- PI, National Science Foundation Plant Genomics Research Program Supplement: Partnership for Research and Education in Plants, 7/15/01-7/14/02, \$48,382.
- PI, Arizona Board of Regents Eisenhower Mathematics and Science Education Act: Bio Boot Camp, 6/1/01-5/31/02, \$47,332.

#### **Awards, Recognition, and Fellowships:**

- Award for Exemplary Contributions to Education, American Society for Biochemistry and Molecular Biology, 2017.
- Fellow, Owens Institute for Behavioral Research, University of Georgia, 2016-present.
- Excellence in Education, American Society of Plant Biologists, 2013
- National Academies Education Fellow in the Life Sciences, 2012
- Virginia Tech Alumni Award for Outreach Excellence, 2005
- American Heart Association [California Affiliate] Pre-doctoral Fellowship, 1997-1999
- University of California Regents Pre-doctoral Fellowship, 1995-1997
- Achievement Rewards for College Scientists Scholarship, Byers' Fellow, 1995-1996
- National Science Foundation Graduate Fellowship, Honorable Mention, 1994
- Graduated cum laude with distinction in the major, Wellesley College, 1993
- Virginia Fiske Recognition in Teaching Award, Wellesley College, 1993

#### **OTHER PROFESSIONAL ACTIVITIES**

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##### **Meetings Organized / Hosted**

- CUREnet2 Website Development Meeting, November 1-3, 2017, Science Education Resource Center at Carleton College. Carleton, MN. 10 participants; funded by NSF.
- Next Generation CURE Assessment Meeting, March 27-29, 2016. Atlanta, GA. 15 participants; funded by NSF.
- Course-based Undergraduate Research Experiences, March 31-April 2, 2014. Cold Spring Harbor Laboratory, NY. 110 participants; funded by NSF.
- Assessment of Course-based Undergraduate Research Experiences, September 12-14, 2013. Chicago, IL. 16 participants; funded by NSF.
- Course-based Undergraduate Research Experiences Network, February 26-28, 2012. HHMI, Chevy Chase, MD. 40 participants; funded by NSF.
- Vision and Change Workshop at Plant Biology 2011 Conference, August 8, 2011. Minneapolis Convention Center, Minneapolis, MN. 100 participants; funded by NSF.

##### **Invited Seminars and Presentations:**

- Invited speaker, Fresno State University, 2018

- Invited speaker, University of Tennessee Knoxville, 2018
- Invited speaker, Indiana University - Purdue University Indianapolis, 2017.
- Invited speaker, Undergraduate Research Conference at the University of California Berkeley, 2017.
- Invited speaker, Geological Society of America Annual Meeting, Seattle, WA, 2017.
- Plenary speaker, New Horizons in Biochemistry and Molecular Biology Education Conference, Weizmann Institute of Science, 2017.
- Plenary speaker, 2017 Transforming Research Undergraduate STEM Education Conference.
- Keynote speaker, Training, Workforce Development, and Diversity Programs, NIH National Institute of General Medical Science, 2017 Principal Investigators Meeting.
- *Effective Practice in Undergraduate Life Sciences Education: The evolving evidence.* Panelist, American Association for the Advancement of Science 2017 Annual Meeting.
- Keynote speaker, University of West Alabama Undergraduate Research Symposium 2017.
- Invited speaker, Mississippi State University, 2016.
- Keynote speaker, UC Davis Scholarship of Teaching and Learning Conference, 2016.
- Invited speaker, Jackson State University, MS, 2016.
- Invited speaker, University of North Carolina Chapel Hill, 2016.
- Invited speaker, the Allied Genetics Conference, Orlando, FL, 2016.
- Keynote speaker, Transforming STEM Pedagogy through Active Learning Conference, Southwestern University, Georgetown, TX, 2016.
- Invited speaker, The Ohio State University, OH, 2016.
- Invited speaker, San Francisco State University, CA, 2016.
- Invited speaker, Michigan State University, MI, 2016.
- Plenary speaker, Gordon Conference on Undergraduate Biology Education Research, Maine, 2015.
- Invited speaker, Institut Pasteur, Paris, France, 2015.
- Invited speaker, American Society for Microbiology Conference on Undergraduate Education, Austin, TX, 2015.
- Invited speaker, Purdue University, IN, 2015.
- Invited speaker, Middle Tennessee State University, TN, 2015.
- Invited speaker, University of South Florida, Tampa, FL, 2015.
- Presentation on assessment at the Freshman Research Initiative Conference, University of Texas Austin, 2014.
- *A science research network: Analysis of the undergraduate experience.* Presentation at the annual meeting of the American Society for Cell Biology, San Francisco, CA, 2012.
- Invited speaker, University of Delaware, Newark, DE, 2012.
- Invited speaker, Yale University, Hartford, CT, 2012.
- Invited speaker, Harvard Medical School, Boston, MA, 2012.
- Keynote speaker, Annual meeting of the American Society for Microbiology, San Diego, CA, 2010.
- Plant Biology 2009 Meeting, Honolulu, HI.

- *Initiating Teacher-Scientist Partnerships*, HHMI, Bethesda, MD, 2007.
- *Biotechnology for Middle School Girls*, Women in Engineering Summer Academy, Lynchburg, VA, 2005, 2006.
- *Plants as Tools for Biotechnology: Factories for Human Pharmaceuticals*, Institute for Advanced Learning and Research, Danville, VA, 2005.
- *Collaboration and Support: Science Magnet Programs*, HHMI, Bethesda, MD, 2004.
- *Plants as Tools for Biotechnology: Factories for Human Pharmaceuticals*, Ferrum College, VA, 2004.
- *The Pattern is in the Proteins*, Human Genome Project Conference, Norfolk State University, Norfolk, VA, 2004.
- *Plants as Tools for Biotechnology: Factories for Human Pharmaceuticals*, Central Virginia Governor's School, Lynchburg, VA, 2003
- *Introduction to Biotechnology*, Human Genome Project Conference, Norfolk State University, VA, 2003
- *Science for Suits: Introduction to Biotechnology*, Virginia Biotechnology Association Biotechnology Summit, McLean, VA, 2003, 2002

#### **Reviewer:**

- Manuscript reviewer: *Advances in Physiology Education, Bioscience, CBE – Life Sciences Education, International Journal of Medical Education, Journal of Higher Education, Journal of Research in Science Teaching, Journal of Science Education and Technology, Journal of STEM Education, Journal of Women and Minorities in Science and Engineering, Learning and Individual Differences, PLoS Biology (Community Pages), PLoS ONE, Science (Education Forum), The Plant Cell.*
- NSF Education and Human Resources Core Research Program, 2016.
- NSF Education and Human Resources Faculty Early Career Development (CAREER) Program, 2015.
- NSF Research on Education and Learning Program, 2014.
- NSF Widening Implementation and Demonstration of Evidence-based Reforms Program, 2013.
- NIH Office of Science Education, Science Education Partnership Award, 2012.
- NSF Discovery Research K-12 Program, 2010, 2011.
- NIH Blueprint for Neuroscience Research Science Education Award, 2011.
- NSF Course, Curriculum, and Laboratory Improvement Program, 2008 (chair), 2009 (chair) / Transforming Undergraduate Education in STEM, 2010 (chair).
- Member of site visit team, National Science Foundation (NSF) Advanced Technological Education Program, 2009.
- NSF Research and Evaluation of Education in Science and Engineering Program, 2009.
- NSF Math Science Partnership Program, 2008, 2009 (chair).
- National Association for Research in Science Teaching Annual Meeting: Proposals for annual conference, 2001, 2002, 2005-2009.
- NIH Small Business Innovation Research Program, Biobehavioral and Behavioral Processes, 2005, 2007-2009-2010.
- HHMI Precollege Outreach Initiative for Biomedical Research Institution, 2006.

- NIH National Center for Research Resources, Science Education Partnership Award, 2004, 2005.
- American Educational Research Association National Meeting: Proposals in Brain, Neurosciences, and Education, 2005, 2006.
- NIH National Institute for Environmental Health and Safety, Division of Extramural Research and Training Program, 2004.
- U.S. Department of Agriculture, Higher Education Challenge Grants, 2002.

#### **Other Board and Committee Service:**

- External Advisory Board Member, CREST Center for Aquatic Chemistry and the Environment, Florida International University, 2017-present.
- Invited working group member, Cottrell Scholars Collaborative to Promote Adoption of Research and Inquiry-Based Lab Curricula, 2016-2017.
- Education Foundation, American Society of Plant Biologists, 2009-2012.
- Advisory Board Member, PlantingScience.org, 2008-2012.
- Strand 2 Co-coordinator (Science Learning: Contexts, Characteristics, and Interactions), Annual meeting of the National Association for Research in Science Teaching, 2008-2010.
- Research Advisory Board, Child Development Center for Learning and Research, Virginia Tech, 2005-2011.
- Chair (2009-2011), Member (2007-2011), Graduate Committee, Department of Biochemistry, Virginia Tech.
- Advisory Board, Increasing the Representation of Women in STEM via a New Interdisciplinary Engineering Program at a Liberal Arts Women's College (Sweet Briar College, Lynchburg, VA), 2006-2008.
- Professional Development Committee, National Association of Biology Teachers, 2005-2008.
- Coordinator, Virginia Tech Science, Technology, Engineering, and Mathematics (VT-STEM) K-12 Outreach Initiative, 2004-2006.
- Chair, Virginia Tech Sigma Xi Teaching Award Committee, 2004-2005.

#### **Evaluation:**

- NSF REU Site projects at Johns Hopkins University, University of Georgia, and University of Texas at Austin, 2014-present.
- Evaluation Consultant, Community College Undergraduate Research Initiative, PI: James Hewlett, 2016-present.
- Evaluation Consultant, Pre-Ph.D. Scholar Program, Hampton University, PI: Edison Fowlks. HHMI, 2008-2012.
- Evaluator, Molecules of Life curriculum development program, NSF Advanced Technology Education Program grant (PI: S Porter, Geospiza, Inc.), 2004.
- 2004 National Science Foundation Institute on Evaluation Participant, The Evaluation Center, Western Michigan University.
- Evaluator, Teacher Internships in Plant Genomics, NSF supplement to a Plant Genome Research Program grant (PIs: R Jorgensen, V Chandler, University of Arizona), 2001.

### Consulting:

- Testing of the Inquiry Science Instruction Observation Protocol, Education Development Center, Newton, MA, 2010-2011.
- Grant proposal writing, Intrexon Corporation, Blacksburg, VA, 2005-2006.
- Science education editing, BCS Publishing Ltd., Oxford, England, 2004-2006.
- Science education editing, Brown Reference Group, Grolier Inc./Scholastic Library Publishing London, England, 2003-2005.
- Education Development Center, Newton, MA, 2000-2002.

### Precollege education and outreach:

- **Principal Investigator, Partnership for Research and Education in Plants (PREP;** [www.preproject.org](http://www.preproject.org)). Multistate partnership effort through which teachers and scientists mentor high school students to design and conduct experiments that help characterize the functions of genes in the plant *Arabidopsis thaliana*. Funded by National Institutes of Health (NIH) National Center for Research Resources (NCRR) Science Education Partnership Award (SEPA). Virginia Tech (2002-2011) and University of Georgia (2011-present).
- **Disseminator, High School Human Genome Project.** Student-teacher-scientist partnership through which teachers guide students in sequencing previously uncharacterized portions of the human genome, which are made available to the scientific community via the Human Genome Project database. Funded by the HHMI and the National Institute on Drug Abuse. Virginia Tech and University of Washington, Seattle, WA. 2004-2006.
- **Disseminator, BIOTECH Project.** A program through which middle and high school students learn standards-based concepts in life science while engaging in hands-on, problem-based biotechnology laboratory activities. Funded by the HHMI. University of Arizona, Tucson, AZ, 1999-2001.
- **Scientist-Facilitator, Women's Triad Project.** After-school science club for middle school girls. Funded by the National Science Foundation (NSF) Experimental Project for Girls and Women program, UCSF SEP, 1995-1997.

### K-12 Teacher professional development experience:

- **Facilitator, Summer Science Institute.** Alexandria City Public School, Virginia. Two-day professional development session for K-12 teachers. 2010.
- **Instructor, Biotech-in-a-Box Professional Development.** Professional development sessions for Virginia high school biology and chemistry teachers interested in using Biotech-in-a-Box materials in their classrooms. 2002-2010.
- **Coordinator, Biotechnology Education Conference.** Three and a half day professional development event on genetics, genomics, and biotechnology that attracts a national audience of high school and college faculty. 2002-2005, 2007.
- **Instructor, BIOTECH Project Professional Development.** Professional development sessions for Arizona middle and high school biology teachers interested in using BIOTECH Project materials in their classrooms. 1999-2001.
- **Facilitator, BrainLink Project.** Late elementary and secondary science teacher professional development program in neuroscience. Funded by NIH NCRR SEPA. Science and Health Education Partnership at University of California, San Francisco (UCSF SEP), 1995-1998.

- **Scientist-Leader, City Science Summer Institute.** Elementary science teacher professional development program. Funded by National Science Foundation (NSF) Local Systemic Change Initiative. UCSF SEP, 1996-1998.
- **Facilitator, Drug Abuse Research Team Program.** High school science teacher professional development program on the science of drug abuse and addiction. Funded by NIH Science Education Drug Abuse Partnership Award. San Joaquin County School District, CA, 1998.

**Professional Memberships:**

- American Association for the Advancement of Science (AAAS)
- American Education Research Association (AERA)
- American Society for Cell Biology (ASCB)
- Society for the Advancement of Biology Education Research (SABER)