Erin Sanders O'Leary, Ph.D.

BIOGRAPHY & C.V.

Dr. Erin Sanders O'Leary is the founding Director of UCLA's Center for Education Innovation & Learning in the Sciences (CEILS), Associate Adjunct Professor in the Dept. of Microbiology, Immunology & Molecular Genetics (MIMG), and Academic Administrator in the Life Science Core Education Department (LS Core). She is also the Coordinator for the NIH IRACDA program called UCLA Postdocs Longitudinal Investment in Faculty Training (UPLIFT) and the Institutional Administrative Co-Leader for UCLA's Center for the Integration of Research, Teaching, and Learning (CIRTL) program; both provide training opportunities for graduate students and/or postdocs in support of their academic career development.

After earning her PhD in Biological Chemistry at UCLA, she went on to develop and teach an innovative laboratory curriculum involving course-based undergraduate research experiences (CUREs) for Life Science STEM majors in MIMG. She currently works closely with UCLA's Center for the Advancement of Teaching (CAT) to train graduate student Teaching Assistant (TA) Consultants campuswide and co-teaches the pedagogy course for TAs in the Life Sciences division (LS 495). Dr. Sanders O'Leary recently taught *Cell and Molecular Biology* (LS7A), a large-enrollment (>300 students per section) biology course for first-year undergraduate students. In her primary role as CEILS Director, she works in collaboration with faculty across the campus to inspire change in teaching practices and provide resources to support transformation of the teaching culture.

In the last decade, Dr. Sanders O'Leary has been awarded millions of dollars in federal and foundation grants to support educational initiatives aimed at making UCLA's teaching culture more innovative, inclusive, and student-centered. She is a published author and recognized research scholar in science education. She was recently awarded a Diversity, Equity, and Inclusion Award by UCLA's Academic Senate for her extraordinary leadership and commitment to diversity initiatives that strengthen the teaching community and support the academic success of students historically underrepresented and underserved in higher education.

PROFESSIONAL PREPARATION

DePaul University | Chicago, IL	Chemistry	B.S.	1998
University of California, Los Angeles | Los Angeles, CA	Biological Chemistry	Ph.D.	2005

APPOINTMENTS

2018 –	*Associate Adjunct Professor*, Dept. of Microbiology, Immunology & Molecular Genetics (MIMG), UCLA
2017 –	*Academic Administrator VII*, Dept. of Life Sciences Core Education, UCLA
2016 –	*Program Coordinator*, UCLA Postdocs Longitudinal Investment in Faculty Training (UPLIFT), NIH IRACDA-funded Program, UCLA

2016 – *Institutional Administrative Co-Leader,* UCLA's Center for the Integration of Research, Teaching, and Learning (CIRTL@UCLA) Network, UCLA

2014 – 2017 *Academic Coordinator III*, Dept. of Life Sciences Core Education, UCLA

2014 – *Project Manager*, STEM Curriculum and Career Development Initiatives in Life Sciences, Funded by IUSE grant to UCLA from the National Science Foundation.

2014 – *Director*, UCLA Center for Education Innovation and Learning in the Sciences (CEILS)

- **Management Responsibilities (5 years):** Oversee daily operations of this campus unit; hire, supervise, train, evaluate, and coordinate the activities of academic and administrative staff including two full-time Senior Associate Directors, one full-time Associate Director, a full-time Administrative Assistant, a full-time Program Representative, and part-time employees such as undergraduate (work study) and graduate assistants; lead and communicate strategic plans with College leadership and Center's faculty advisory board; coordinate strategic/budget planning for Center's 5-year self-review; recommend and report annual budget, resource support, and service allocations for Center.
- **Service Highlights:** Facilitate teaching development workshops, consult with faculty on pedagogical practices, collaborate with faculty to develop grant proposals, manage grant-funded projects and budgets, engage in the scholarship of teaching and learning/education research, contribute to campus wide committees, advisory boards, and task forces supporting instructional innovation and inclusive education.

2013 – 2016 *Project Manager*, Campus-wide Self-Study of Teaching Practices, Funded by WIDER grant to UCLA from the National Science Foundation

2009 – 2018 *Assistant Adjunct Professor*, Dept. of Microbiology, Immunology & Molecular Genetics (MIMG), UCLA

2009 – 2014 *Co-Director*, Education Grant Awarded to UCLA from the Howard Hughes Medical Institute (HHMI) through the Pre College and Undergraduate Science Education Program

2009 – 2013 *Director for Interdepartmental Undergraduate Research Instructional Laboratory Program,* Depts. of MIMG and MCDB, UCLA

- **Management Responsibilities (4 years):** Oversaw daily operations and budget for interdepartmental instructional laboratory facility; trained all graduate student and professional Teaching Assistants; recruited and supervised Lecturers; trained, evaluated and coordinated the activities of technical staff including a senior-level Staff Research Associate (SRA IV) and undergraduate Laboratory Assistants.

2006 – 2013 *Faculty Advisor for Departmental Teaching Assistant Training*, Dept. of MIMG, UCLA

2006 – 2009 *Coordinator for Departmental Instructional Laboratory Curriculum*, Dept. of MIMG, UCLA

- **Management Responsibilities (3 years):** Oversaw daily operations of departmental instructional laboratory facility; trained graduate student and professional Teaching Assistants in laboratory courses; trained, evaluated and supervised activities of entry-level full-time technical staff including a level I Staff Research Associate (SRA I) and a level II Laboratory Assistant.

2006 – 2014 *Academic Coordinator II*, Dept. of MIMG, UCLA

2005 – 2006 *Lecturer*, Dept. of MIMG, UCLA

1998 – 2005 *Graduate Student Research,* Dept. of Biological Chemistry, UCLA

SERVICE

2019 –	*Committee Member,* Mentoring and Evaluation of Graduate Academic Progress (MEGAP) Implementation Workgroup, UCLA Graduate Division
2019 –	*Steering Committee Member,* General Education Foundations in Scientific Inquiry (GE FSI) Assessment, UCLA
2019 –	*Task Force Member,* Degree Attainment and Student Success, UCLA (appointed by EVC)
2019 –	*Advisory Board Member*, Center for the Advancement of Teaching (CAT), UCLA
2019 –	*External Review Board Member*, UC-Berkeley Undergraduate Data Science at Scale, NSF IUSE grant (PI: D. Harding)
2019	*Search Committee Member*, Chief Administrative Officer (CAO), Life Sciences Core Education Dept./CEILS, UCLA
2019	*Search Committee Member*, Fund Manager, Life Sciences Core Education Dept./CEILS, UCLA
2019 –	*PhD Dissertation Committee Member*, Edgar Romo (GSE&IS), UCLA
2019	*Advisory Board Member,* Masters of Applied Statistics (MAS), UCLA
2019	*Advisory Board Member,* Mechanobiology Workshop, UCLA
2018 – 2019	*Project Team Co-Lead*, Student Outcomes/Bottleneck Course Identification, Improving Time-to-Degree Initiative led by EVC/P, UCLA
2018 – 2019	*Faculty Advisory Launch Committee Member*, Office of Instructional Development (OID), UCLA (appointed by EVC/P)
2018 – 2019	*Project Team Member,* Development and Administration of UC systemwide RFP for Online Grading Solution, UCOP
2018 –	*Advisory Board Member*, Program for Excellence in Education and Research in the Sciences (PEERS), Undergraduate Research Center - Sciences, UCLA
2018	*Search Committee Member*, Academic Administrator for GE FSI Curriculum Assessment and Reform, Office of Instructional Development (OID), UCLA
2018	*Search Committee Member*, Assistant Director for Teaching & Learning Initiatives, Office of Instructional Development (OID), UCLA
2018	*Search Committee Member*, Teaching Professor (LPSOE), Dept. of Psychology, UCLA
2018	*Reviewer*, Life Science Excellence Awards Committee, UCLA
2017 –	*Committee Member*, Design of Teaching Space in Botany Building, UCLA
2017 –	*Co-Chair for Assessment Subcommittee and Member,* Diversity Education Governance Committee (DEGC), UCLA
2017 – 2018	*Task Force Member,* General Education Foundations in Scientific Inquiry Ad Hoc Committee, UCLA (appointed by Chair, Undergraduate Council)
2017 – 2018	*Search Committee Member*, Academic Administrator for Life Sciences Math Curriculum, Dept. of LS Core Education, UCLA
2017	*Task Force Member*, UCLA Strategic Plan: Education Innovation, UCLA (appointed by EVC/P)
2017	*Search Committee Member*, Lecturer, Neuroscience undergraduate IDP, UCLA
2016 – 2019	*Coordinator/Mentor,* NSF- and HHMI-sponsored Mobile Summer Institute, UCLA
2015 –	*Founding Member,* Cross-Campus Teaching Innovations Group (CTIG), UCLA
2015 – 2017	*Grant Proposal Review Committee Member*, Common Collaboration & Learning Environment (CCLE) Instructional Development Program (IDP), UCLA
2014 – 2018	*Co-Chair*, Reinvention Center Science of Learning/Pedagogical Innovation Specialized Network (appointed by Vice Provost, Undergraduate Education)
2013 – 2017	*Advisory Board Member*, Minority Access to Research Centers (MARC) Program, UCLA

2013 *Search Committee Chair*, Lecturer, Dept. of MIMG, UCLA
2013 *Invited Participant*, AAAS Vision & Change in Undergraduate Education Conference
2013 – 2014 *Planning Committee Member*, SoCAL PKAL Conference (February 2014)
2012 – 2014 *Steering Committee Member*, MIMG Laboratory Safety, UCLA
2010 *NSF Review Panel*, Transforming Undergraduate Education in STEM (TUES) Type I
2010 – 2011 *Curriculum Committee Member*, Quantitative Biology, UCLA
2010 *Syllabus Committee Member*, CRLC Path 2 Seminar Courses, UCLA
2010 *HHMI Review Panel*, Scientific Foundations for Future Physicians (SFFP) curriculum experiment, collaborative proposals
2009 – 2013 *Curriculum and Instruction Committee Member*, Dept. of MIMG, UCLA
2009 *Invited Participant*, AAAS Vision & Change in Undergraduate Education Conference
2008 *NSF Review Panel*, Course, Curriculum, and Laboratory Improvement (CCLI) Phase I
2008 *Faculty Advisor*, U.S. Department of Energy Joint Genome Institute Education Program
2008 *Associate Member*, Howard Hughes Medical Institute (HHMI) Science Education Alliance-Phage Hunters Advancing Genomics and Evolutionary Science (SEA-PHAGES)

PROFESSIONAL MEMBERSHIPS

2017 – American Association for the Advancement of Science (AAAS)
2014 – Professional and Organizational Development (POD) Network in Higher Education
2013 – Association of American Colleges and Universities (AAC&U) Campus Associate
2013 – Partnership for Undergraduate Life Sciences Education (PULSE) Community
2013 – The Academy of Inquiry Based Learning (AIBL)
2006 – American Society for Microbiology (ASM)

TEACHING

2017 – *Primary Teaching Responsibility*: Graduate courses supporting pedagogy training for teaching assistants (TAs) in the UCLA Life Sciences Division. As schedule permits, some undergraduate course instruction.

LS 495: Preparation for College-Level Teaching in Life Sciences (G, Winter 2018, Fall 2018, Winter 2019, Fall 2019, 20-70 total students enrolled per term, oversight of 1-2 graduate student Teaching Assistants per course)

MCDB 495: Preparation for Teaching in Higher Education (Fall 2017, G, >40 students enrolled, 1 graduate student Teaching Assistant)

LS7A: Cell & Molecular Biology (Fall 2017, UG, lower-division, >350 students enrolled, 5 graduate student Teaching Assistants)

2005 – 2013 *Primary Teaching Responsibility*: Undergraduate instructional laboratory courses in the Department of Microbiology, Immunology, and Molecular Genetics (MIMG), including development and teaching of two CUREs, or course-based undergraduate research experiences.

MIMG 103AL/BL: Research Immersion / Advanced Research Analysis in Virology
MIMG 109AL/BL: Research Immersion / Advanced Research Analysis in Microbiology

WORKSHOP & LEARNING COMMUNITY FACILITATION (HIGHLIGHTS 2014-19)

Faculty Workshop on Best Practices in Teaching: Annual, all-day fall workshop with sessions on inclusive teaching strategies, backward design, active learning, group work, and equitable grading strategies showcasing educational technology supporting pedagogical innovation; audience includes instructors new to teaching and those teaching large-enrollment STEM gateway courses.

Bringing Theory to Practice Workshops: Quarterly 2 hour workshops on a range of topics on best practices in teaching and learning. Current workshops facilitated by ESO include:

(1) *Creating Equitable Learning Environments and Teaching Inclusively*: This two-part workshop provides an overview of research conducted at UCLA as well as national data on issues related to equity and persistence in STEM education. Participants discuss the difference between equity and equality, impact and intent, and learn about how implicit bias and stereotype threat are barriers to student success in the classroom. Strategies to create a welcoming, inclusive classroom are discussed.

(2) *Training to Use COPUS, Classroom Observation Protocol for Undergraduate STEM Classrooms*: Provides an overview of classroom observation protocols with emphasis on COPUS, practice using the protocol and interpreting COPUS data. Introduces participants to GORP tool for electronically capturing classroom observation data.

Summer Institute on Scientific Teaching: 4-day professional development workshop for STEM instructors who teach undergraduate courses. Participants develop the teaching, assessment, and classroom observation skills they need to begin an evidence-based curricular transformation of their courses. Current education research on active learning, assessment, reflective practice, and inclusive teaching are woven into the program, creating a forum to share ideas and develop innovative instructional materials to be implemented during the following academic year.

STEM Education Research Journal Club: Learning community includes faculty, graduate students, postdocs, and undergraduate students. Together, participants explore relevant education literature in more depth and develop a greater understanding of assessment techniques and data analysis methods. Presenters may lead a discussion about the relationship between effective teaching practices and their impact on student learning, knowledge retention, and persistence in STEM majors. Alternatively, towards the goal of publishing their scholarship, presenters describe classroom innovations they are trying in their own courses and solicit feedback from participants.

Cross-campus Teaching Innovations Group: A multidisciplinary, action-oriented learning community comprised of practitioners and education leaders who bring diverse perspectives, pedagogical expertise in the disciplines, and extensive classroom and instructional technology experience. Participants conceive and implement transformative education projects and disseminate evidence-based practices towards the goal of improving student learning and achieving inclusivity and transparency in teaching.

HONORS AND AWARDS

Biology Teaching Assistant Project (BioTAP) Program Scholar (2018-2019)

Diversity, Equity, and Inclusion Award (UCLA Academic Senate, Category: Staff; 2018)
Summer Institute Scientific Teaching Mentor (2017-2019)
JMBE Spotlight Issue, Stellar Science Education Research (Vol. 16, 2016)
UCLA Life Sciences Award for Education Innovation (Category: Non-ladder faculty; 2014)
National Academies Summer Institute Education Fellow in the Life Sciences (2006)
Enriched Program for Development of Teaching Skills Training Grant Fellow (1999-2001)
Biological Chemistry Graduate Student Council Representative (2001-2002)
Phi Kappa Phi Honor Society, Golden Key National Honor Society (1996)
DePaul Volunteers Serving Women (1995)
Alpha Lambda Delta National Academic Honor Society (1995)

GRANTS (DIRECT COSTS ONLY) SUPPORTING EDUCATION PROJECTS

i. Current Support ($5.1M)

1) *Assessment of UCLA Diversity Courses: A Pilot Study to Measure the Impacts of a College Requirement Designed to Foster an Inclusive Education for All Undergraduate Students.* Programmatic Assessment Project funded by the UCLA Center for the Advancement of Teaching (CAT). (Role: Co-PI). 01/01/19-12/31/19; **$25,998** (or equivalent in-kind support).

2) *Collaborative Research: NSF INCLUDES Alliance: National Alliance for Inclusive and Diverse STEM Faculty (Aspire)*, National Science Foundation (NSF) Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (INCLUDES) Program. (Role: PI, Collaborative Proposal). 10/01/18-08/31/23; **$680,227**.

3) *Building a Framework to Integrate STEM Curricular and Co-Curricular Innovations at UCLA*, The Association of American Universities (AAU) Undergraduate STEM Education Initiative Network. (Role: Co-Director). 02/01/17-03/31/20; **$20,000**.

4) *UPLIFT: UCLA Postdocs' Longitudinal Investment in Faculty Training*, National Institutes of Health (NIH) Institutional Research and Academic Career Development Awards (IRACDA) K12 Program. (Role: Senior Personnel and Program Administrator). 09/01/16-08/31/21; **$2,581,207**.

5) *Implementation of Student-Centered Pedagogy, Its Impact on Learning, Persistence, and the Teaching Culture,* National Science Foundation (NSF) Improving Undergraduate STEM Education (IUSE) Program. (Role: Co-PI and Project Manager). 9/1/14-8/31/20; **$1,805,148**.

ii. Prior Support ($2.5M)

1) *Enhancing Motivational Predictors of Student Success Across the Introductory Life Sciences Curriculum.* UCLA Office of Instructional Development Instructional Improvement Program. (Role: Co-PI). 12/14/18-6/30/19; **$7,900**.

2) *Collaborative Research: CIRTL INCLUDES – Toward an Alliance to Prepare a National Faculty for Broadening Success of Underrepresented 2-Year and 4-Year STEM Students*, National Science Foundation (NSF) Inclusion across the Nation of Communities of Learners of Underrepresented

Discoverers in Engineering and Science (INCLUDES) Program. (Role: PI, Collaborative Proposal). 10/01/16-12/31/18; $9,966.

3) *The BD2K Concept Network: Open Sharing of Active Learning and Tools Online,* National Institutes of Health (NIH) Open Educational Resources for Biomedical Big Data (R25). (Role: Co-I). 12/1/14-11/30/17; $607,200.

4) *Implementation and Assessment of a New Laboratory for EEB CM173/EPSS CM173: Earth Process & Evolutionary History*. UCLA Office of Instructional Development Instructional Improvement Program. (Role: Co-PI). 6/13/17-6/30/18; $9,501.

5) *Transforming the Culture of Teaching and Learning at UCLA: Development of a Change Strategy for STEM Education*, National Science Foundation (NSF) Widening Implementation & Demonstration of Evidence-Based Reforms (WIDER) Program. (Role: Project Director). 10/1/13-9/30/16; $179,154.

6) *Improving Persistence of Underrepresented Minority Students in Science, Technology, Engineering, and Math (STEM) Majors*, Doris Duke Foundation (Role: Co-PI). 12/1/13-7/15/15; $100,000.

7) *Evaluating Technology-Assisted Active Learning in Bioinformatics Courses*, UCLA Office of Instructional Development Instructional Improvement Program. (Role: Co-PI). 8/8/14-6/30/15; $23,392.

8) *Moodle Module for In-Class Open-Response Concept Testing,* UCLA CCLE Innovation and Development Program. (Role: Co-PI). 5/14/14-6/30/15; $30,000.

9) *Undergraduate Biological Sciences*; Howard Hughes Medical Institute 2010 Science Education Grant Competition. (Role: Co-Director). 9/1/10 – 8/31/14; $1,200,000.

10) *Research Informatics and Computational Data Development for the CRLC*; Institute for Digital Research (IDRE) and Institute for Informatics (I2) 2011 Grant Program. (Role: PI). 8/8/11 – 8/7/12; $10,237.

11) *Integration of Genome Analysis Tools into Life Science Laboratory Courses*; UCLA Office of Instructional Improvement Grant Program. (Role: PI). 7/1/11 – 6/30/12; $9,420.

12) *A Competency-based Research Laboratory Curriculum for Life Science Majors*. National Science Foundation (NSF) Transforming Undergraduate Education in STEM (TUES, Type 2) Program. (Role: PI). 9/1/10-8/31/12; $135,315.

13) *Enhancement of an Interdepartmental Laboratory Curriculum for Life Science Majors*; UCLA Office of Instructional Improvement Grant Program. (Role: Co-PI). 7/1/10 – 6/30/11; $16,720.

14) *Measuring Nitrogen Fixation in Undergraduate Labs Safely and Non-invasively*; UCLA Office of Instructional Improvement Grant Program. (Role: Co-PI). 7/1/09 – 6/30/10; $2,700.

15) *Transformation of a Majors Laboratory Course from 'Cookbook' to 'Discovery-based' – MIMG 103L*; UCLA Office of Instructional Improvement Grant Program. (Role: PI). 7/1/08-6/30/09; $29,997.

16) *Implementation and Evaluation of an Undergraduate Inquiry-based Research Laboratory Program in Microbial Ecology*. National Science Foundation (NSF) Course, Curriculum, and Laboratory Improvement (CCLI, Type 1) Program. (Role: PI). 3/1/08-2/28/10; $97,403.

17) *Curricular Enhancement Across the Undergraduate Research Landscape by the LI-COR 4300 System*. Genomics Education Matching Funds (GEMF) Program. (Role: PI). 7/1/07-1/31/09; $52,152.

18) *Interdepartmental Curricular Integration of the Undergraduate Discovery-based Research Laboratory, MIMG 188, with the Introductory Biology Course, LS 1*; UCLA Office of Instructional Improvement Grant Program. (Role: PI). 7/1/07-6/30/08; $20,269.

19) *Expansion of the Undergraduate Discovery-based Research Laboratory Course – MIMG 188*; UCLA Office of Instructional Improvement Grant Program. (Role: PI). 7/1/06 – 6/30/07; $16,908.

PUBLICATIONS (*denotes undergraduate/graduate/post-doctoral advisees)

1) **Sanders O'Leary E**, Shapiro C, Toma S, Levis-Fitzgerald M, Johnson T, and Sork VL (2020) Creating Inclusive Classrooms by Engaging STEM Faculty in Culturally Responsive Teaching Workshops. Accepted for publication in the *International Journal of STEM Education*.

2) Kennison RL, Shapiro C, Gregg J, Liu A, Levis-Fitzgerald M, and **Sanders O'Leary E** (in progress) Scaling Up a Career Course to Drive STEM Persistence: Impact on Undergraduate Student Self-Awareness, Confidence, and Self-Efficacy in Pursuit of Diverse Science Careers.

3) **Sanders O'Leary E**, Eagan MK, Fregoso J, Conley W, Garfinkel A, Shevtsov J*, Hasson T, and Van Valkenburgh B (in progress) Reimagining the Introductory Math Curriculum for Life Science Majors.

4) Khan N, Martínez-Hidalgo P, Ice TA, Maymon M, Humm EA, Nejat N, **Sanders ER**, Kaplan D, and Hirsch AM (2018) Antifungal Activity of *Bacillus* Species Against *Fusarium* and Analysis of the Potential Mechanisms Used in Biocontrol. *Frontiers in Microbiology* 9: 2363. DOI:10.3389/fmicb.2018.02363.

5) Lee CJ, Toven-Lindsey B*, Shapiro C, Soh M*, Mazrouee S*, Levis-Fitzgerald M, and **Sanders ER** (2018) Error-Discovery Learning Boosts Student Engagement and Performance, while Reducing Student Attrition in a Bioinformatics Course. *CBE-Life Sciences Education* 17(3): 1-13. DOI:10.1187/cbe.17-04-0061.

6) Stains M, Harshman J, Barker MK, Chasteen SV, Cole R, DeChenne-Peters SE, Eagan Jr. MK, Esson JM, Knight JK, Laski FA, Levis-Fitzgerald M, Lee CJ, Lo SM, McDonnell LM, McKay TA, Michelotti N, Musgrove A, Palmer MS, Plank KM, Rodela TM, **Sanders ER**, Schimpf NG, Schulte PM, Smith MK, Stetzer M, Van Valkenburgh B, Vinson E, Weir LK, Wendel PJ, Wheeler LB, and

Young AM (2018) Anatomy of STEM Teaching in North American Universities. *Science* 359(6383): 1468-1470. DOI: 10.1126/science.aap8892.

7) Sellami N*, Shaked S, Laski F, Eagan MK, and **Sanders ER** (2017). Implementation of a Learning Assistants Program Improves Student Performance on Higher-Order Assessments. *CBE-Life Sciences Education* 16(4): ar62. DOI: 10.1187/cbe.16-12-0341.

8) Lorenz T, Fernandez AM, Marquez P, Zambrano C, Signer R, Stilleke S, Benyamini P, and **Sanders ER** (2017) Basic light microscopy using brightfield and phase optics. *Microbe Library Laboratory Protocol*. American Society for Microbiology, Washington, DC. Accepted 04 January 2017, http://www.asmscience.org/VisualLibrary.

9) **Sanders ER**, Moberg-Parker J, Hirsch AM, Lee PY, Shapiro C*, Toma S*, and Levis-Fitzgerald M (2016) Transforming Laboratory Education in the Life Sciences: A Scalable Framework for Designing Authentic Undergraduate Research Experience-based Courses Benefits Both Students and Faculty. *Microbe* 11(2): 69-74.

10) Shapiro C*, Moberg-Parker J, Toma S*, Ayon C*, Zimmerman H*, Roth-Johnson EA*, Hancock S*, Levis-Fitzgerald M, and **Sanders ER** (2015) Comparing the Impact of Course-based and Apprentice-based Research Experiences in a Life Science Laboratory Curriculum. *J. Microbiol. Biol. Educ.* 16(2): 186-197.

11) Hurtado S, Sork VL, **Sanders ER**, Wahl K, and Teel T* (2015) *Enhancing Student Success and Building Inclusive Classrooms at UCLA*. Report to the Executive Vice Chancellor and Provost. Accessed 14 May 2016, http://evc.ucla.edu/reports.

12) Maymon M, Martínez-Hidalgo P, Tran S, Ice T, Craemer K, Anbarchian T, Sung T, Hwang LH, Chou M, Fujishige NA, Villella W*, Ventosa J, Sikorski J, **Sanders ER**, Faull KF, and Hirsch AM (2015) Mining the Phytomicrobiometo Understand How Bacterial Coinoculations Enhance Plant Growth. *Front. Plant Sci.* 6(784): 1-14.

13) **Sanders ER** and Hirsch AM (2014). Immersing Undergraduate Students into Research on the Metagenomics of the Plant Rhizosphere: A Pedagogical Strategy to Engage Civic-Mindedness and Retain Undergraduates in STEM. *Front. Plant Sci.* 5: 157.

14) Pope WH, Anders KR, Baird M, Bowman CA, Boyle MM, Broussard GW, Chow T*, Clase KL, Cooper S*, Cornely KA, DeJong RJ, Delesalle VA, Deng L, Dunbar D, Edgington NP, Ferreira CM, Weston Hafer K, Hartzog GA, Hatherill JR, Hughes LE, Ipapo K*, Krukonis GP, Meier CG, Monti DL, Olm MR, Page ST, Peebles CL, Rinehart CA, Rubin MR, Russell DA, **Sanders ER,** Schoer M, Shaffer CD, Wherley J, Vazquez E, Yuan H, Zhang D, Cresawn SG, Jacobs-Sera D, Hendrix RW, and Hatfull GF (2014). Cluster M Mycobacteriophages Bongo, PegLeg, and Rey with Unusually Large Repertoires of tRNA Isotypes. *Journal of Virology* 88(5): 2461-2480.

15) Hatfull GR, Science Education Alliance Phage Hunters Advancing Genomics and Evolutionary Science (SEA-PHAGES) Program, KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH), Mycobacterial Genetics Course, **University of California Los Angeles Research Immersion Laboratory in Virology***, and Phage Hunters Integrating Research and Education

(PHIRE) Program (2013) Complete Genome Sequences of 63 Mycobacteriophages. *genomeA* 1(6): e00847-13.

16) Shapiro C*, Ayon C*, Moberg-Parker J, Levis-Fitzgerald M, and **Sanders ER** (2013). Strategies for Using Peer-Assisted Learning Effectively in an Undergraduate Bioinformatics Course. *Biochemistry and Molecular Biology Education* 41(1): 24-33.

17) Schwartz AR, Ortiz I, Maymon M, Herbold CW, Fujishige NA, Vijanderan JA*, Villella W*, Hanamoto K, Kim W, Diener A, **Sanders ER**, DeMason DA, and Hirsch AM (2013). *Bacillus simplex*, A Little Known PGPB with Anti-Fungal Activity, Alters Pea Legume Root Architecture and Nodule Morphology with Co-Inoculated with *Rhizobium leguminosarum* bv. *viciae*. *Agronomy* 3: 595-620.

18) **Sanders ER** (2012a) Aseptic Laboratory Techniques: Volume Transfers with Serological Pipettes and Micropipettors. *J. Vis. Exp*. 63: e2754.

19) **Sanders ER** (2012b) Aseptic Laboratory Techniques: Plating Methods. *J. Vis. Exp*. 63: e3064.

20) Heiss JK, **Sanders ER**, and Johnson RC (2011). Intrasubunit and intersubunit interactions controlling assembly of active synaptic complexes during Hin-catalyzed DNA recombination. *Journal of Molecular Biology* 411: 744-764.

21) **Sanders ER** and Miller JH (2010). *I, Microbiologist: A Discovery-based Course in Microbial Ecology and Molecular Evolution*. ASM Press, Washington DC.

22) Ditty J, Kvaal C, Goodner G, Freyermuth S, Bailey C, Britton R, Gordon S, Heinhorst S, Reed K, Xu Z, **Sanders E**, Axen S, Kim E, Johns M, Scott K, and Kerfeld C (2010). Incorporating Genomics and Bioinformatics Across the Life Sciences Curriculum. *PLoS Biology* 8(8): e1000448.

23) **Sanders ER** (2007) The Mildred E. Mathias Botanical Garden as a Classroom for Teaching Microbial Ecology & Evolution at UCLA. *Mildred E. Mathias Botanical Garden Newsletter* 10: 7-8, 11.

24) Hausner G, Olson R, Simon D, Johnson I, **Sanders ER**, Karol KG, McCourt RM, and Zimmerly S (2006). Origin and Evolution of the Chloroplast *trnK* (*matK*) Intron: A Model for Evolution of Group II Intron RNA Structures. *Molecular Biology and Evolution* 23: 380-391.

25) Dhar G, **Sanders ER**, and Johnson RC (2004). Architecture of the Hin Synaptic Complex During Recombination: the Recombinase Subunits Translocate with the DNA Strands. *Cell* 119: 33-45.

26) **Sanders ER** and Johnson RC (2004). Stepwise Dissection of the Hin-catalyzed Recombination Reaction from Synapsis to Resolution. *Journal of Molecular Biology* 340: 753-766.

27) **Sanders ER**, Karol KG, and McCourt RM (2003). Occurrence of *mat*K in a *trn*K Group II Intron in Charophyte Green Algae and Phylogeny of the Characeae. *American Journal of Botany* 90: 628-633.

28) Merickel SK, **Sanders ER**, Vázquez-Ibar JL, and Johnson RC (2002). Subunit Exchange and the Role of Dimer Flexibility in DNA Binding by the Fis protein. *Biochemistry* 41: 5788-5798.

RECENT EDUCATION CONFERENCE PRESENTATIONS (*poster, #talk)

#Kennison R, Gregg J, Shaked S, and **Sanders O'Leary E** (2020) *Applying a Six-Level Framework to Evaluate the Impact of a STEM Center on Faculty, Students, and Institutional Transformation*. Network of STEM Education Centers (NSEC) 8th Annual National Conference (virtual meeting).

#Sanders ER and Van Valkenburgh (2018) *Reimagining the Introductory Math Curriculum for Life Science Majors: A Study of Student Success and Overcoming Cultural Barriers*. Reinvention Collaborative National Conference. Cultivating Curiosity, Creativity, and Discovery: Undergraduate Educational Experiences in Research Universities. Arlington, VA.

#Sanders ER and Wahl K (2018) *Learning Outcomes Assessment: Catalyzing Innovation in STEM Education to Effect Institutional Change.* Reinvention Collaborative National Conference. Cultivating Curiosity, Creativity, and Discovery: Undergraduate Educational Experiences in Research Universities. Arlington, VA.

#Sanders ER and Wahl K (2018) *Assessment: From Adherence to Innovation in STEM.* WSCUC Academic Resource Conference, San Francisco, CA.

***Sanders ER**, Eagan, Jr. MK, Garfinkel A, Shevtsov J, Conley W, and Van Valkenburgh (2018) *Reimagining the Introductory Math Curriculum for Life Science Majors: A Study of Student Success and Overcoming Cultural Barriers*. SABER West, Irvine CA.

#Sanders ER, Levis-Fitzgerald M, Shapiro C, and Sork V (2017) *Engaging Faculty in Student Success Workshops Promoting Equity and Inclusion in STEM Classrooms*. AAC&U Conference, Transforming STEM Higher Education: Discovery, Innovation, and the Value of Evidence. San Francisco, CA.

#Molinaro M, **Sanders ER**, Rehrey G, and Greer J (2016) *Promoting Academic Success and Inclusion: Integrating Diverse Faculty and Student Voices into Pedagogical Innovation and the Use of Learning Analytics*. Reinvention Collaborative National Conference. Diversity, Culture, and Identity in America's Research Universities. Arlington, VA.

#**Sanders ER** (2016) *Data Mining Identifies Inclusive Grading Practices*. Tools for Evidence-based Action (TEA) Conference. University of California Davis, Davis, CA.

***Sanders ER** and Levis-Fitzgerald M (2016) *Transforming STEM Laboratory Education: A Scalable Framework for Designing Authentic Undergraduate Research Experiences*. AAAS and NSF Conference. Envisioning the Future of Undergraduate STEM Education: Research and Practice, Washington, DC.

*Hurtado S, Sork V, Wahl K, **Sanders ER**, Teel T, Turner P, Van Valkenburgh B, Wesel R, and Russell A (2016) *Transforming the Culture of Teaching and Learning at a Public Research University*. AAAS

and NSF Conference. Envisioning the Future of Undergraduate STEM Education: Research and Practice, Washington, DC.

[#]Wahl KE and **Sanders ER** (2016) *Data Mining to Enhance Equity*. WASC Senior College and University Commission Academic Resource Conference (ARC). Garden Grove, CA.

[#]Horii C (Caltech), Gallow D (UC Irvine), **Sanders ER** (UCLA), and Elzarka S (Univ. of La Verne) (2016) *Faculty and Educational Development: A SIG Hosted by the POD Network in Higher Education*. WASC Senior College and University Commission Academic Resource Conference (ARC). Garden Grove, CA.

***Sanders ER**, Eagan MK, and Laski F (2015) *Implementation of Student-Centered Pedagogy in Large Biology Courses: Its Impact on Learning, Persistence, and the Teaching Culture*. AAC&U Crossing Boundaries: Transforming STEM Education Conference. Seattle, WA.

[#]**Sanders ER** (2015) *Making the Case to Build Inclusive Classrooms that Drive Student Success*. Science and Mathematics Teaching Imperative (SMTI) and Network of STEM Education Centers (NSEC) National Conference. New Orleans, LA.

[#]**Sanders ER**, Van Valkenburgh B, and Eagan MK (2014) *Changing the Teaching Culture by Campus-wide Self-Assessment of STEM Faculty*. AAC&U Conference, Transforming STEM Higher Education: A Network for Academic Renewal. Atlanta, GA.

[#]**Sanders ER** (2014) *Integrating Authentic Research into the Life Sciences Curriculum at Public Research Universities*. American Society for Microbiology (ASM) General Meeting. Boston, MA.

INVITED SPEAKING ENGAGEMENTS

2019 *Plenary Session, UCLA Center for the Advancement of Teaching (CAT) TA Training Program Campuswide Conference*, Los Angeles, CA
2018 *Plenary Session, UCLA Office of Instructional Development TA Training Program Campuswide Conference*, Los Angeles, CA.
2017 *Workshop on Transforming Laboratory Education in Life Sciences*, Baylor University, Waco, TX
2017 *Caltech Teaching Conference*, Seminar on Effective Teaching, Pasadena, CA.
2017 *Plenary Session, UCLA Office of Instructional Development TA Training Program Campuswide Conference*, Los Angeles, CA.
2016 *80th Annual Meeting of the Southern California Branch of the American Society for Microbiology (SCASM)*, La Jolla, CA.
2016 *Caltech Teaching Conference*, Careers in the Classroom Session, Pasadena, CA.
2015 *I, Microbiologist Workshop*, Drexel University, Philadelphia, PA.
2014 *114th General Meeting, American Society for Microbiology*, Boston, MA.
2012 *24th Annual California State University Biotechnology Symposium,* Santa Clara, CA.
2011 *Cal State LA, Faculty and Graduate Student Seminar*, Los Angeles, CA.
2011 *National Association of Biology Teachers (NABT) Conference*, Anaheim, CA.
2010 *ASM Conference for Undergraduate Educators,* Author Corner, San Diego, CA.
2009 *ASM Conference for Undergraduate Educators,* Author Corner, Ft. Collins, CO.
2008 *16th International Microbial Genomics Conference*, Lake Arrowhead, CA.

PRESS RELEASES & INVITED INTERVIEWS ON STEM EDUCATION INITIATIVES

UCLA Newsroom (September 6, 2018): "UCLA Shares National Science Foundation Grant to Diversity STEM Faculty Nationally" http://newsroom.ucla.edu/dept/faculty/ucla-shares-national-science-foundation-grant-to-diversify-stem-faculty-nationally

NSF Press Release 18-074 (September 6, 2018): "NSF INCLUDES Takes Major Step Forward With New Awards" https://www.nsf.gov/news/news_summ.jsp?cntn_id=296531

UCLA Newsroom (March 1, 2017): "UCLA to Enhance Undergraduate STEM Education" http://newsroom.ucla.edu/stories/aau-grant-to-ucla-to-enhance-undergraduate-stem-education

ASM's Education Blog (January 10, 2017): "Make Mentoring Work in our Classroom or Lab" https://www.asm.org/Articles/2017/January/Teaching-Microbiology-30

UCLA Newsroom (October 27, 2016): "UCLA, Cal state LA work together to prepare young scientists for teaching" http://newsroom.ucla.edu/stories/ucla-cal-state-la-work-together-to-prepare-young-scientists-for-teaching

NSF Press Release 16-104 (September 12, 2016): "First NSF INCLUDES awards issued to 37 projects" https://www.nsf.gov/news/news_summ.jsp?cntn_id=189706

UCLA Newsroom (February 24, 2016): "UCLA joins center aimed at increasing diversity among future STEM faculty" http://newsroom.ucla.edu/dept/faculty/ucla-joins-center-aimed-at-increasing-diversity-among-future-stem-faculty

AAMC Reporter (July 2013): "Pre-Med Programs Eye Curriculum to Prep Students for New MCAT® Exam" https://www.aamc.org/newsroom/reporter/july2013/349944/mcat-prep.html (no longer web accessible)

The Scientist (December 1, 2012): "Genomics 101: Undergraduate students delve into genomics and synthetic biology thanks to a new breed of technologically advanced courses" http://www.the-scientist.com/?articles.view/articleNo/33358/title/Genomics-101/