



BIOLOGY NEWS

A publication of a division of the
Council on Undergraduate Research
Volume 9, Number 2 • Summer 2019

Message from the Biology Division Chair

Karen Resendes (Westminster College)

Welcome to the Summer 2019 edition of the CUR Biology Division newsletter! As your semesters have come to a close, may you have the time to focus on the projects you hold near to your heart. May the articles in this newsletter spark your interest, and when your projects intersect with undergraduate research, make sure you keep CUR in mind.

- Are you looking to connect with others and gather ideas? Use the CUR community:
<https://community.cur.org/home>
- Are you thinking about developing a CURE for your class, or are you ready to help mentor someone new to the process? Consider applying for the next cohort of the MIRIC program:
<https://www.cur.org/who/governance/divisions/biology/miric/>
- Delving more broadly into UR? Consider attending the Undergraduate Research Programs Conference: <https://www.cur.org/what/events/conferences/urpc/>

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About CUR's Biology Division

The Biology Division of the Council on Undergraduate Research provides networking opportunities, activities, and resources to assist biology administrators, faculty members, students, practitioners, and others in advancing undergraduate research.

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Council on Undergraduate Research

Message from the Chair

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- Thinking of assessing your UR programs? Check out the online CUR bibliography and the many other member resources available with your CUR membership: <https://www.cur.org/resources/faculty/>
- Finally, it's never too soon to start thinking about running for a Councilor position in Biology. Read the profiles of councilors in this issue and find more information here about CUR governance: <https://www.cur.org/who/governance/>

Wherever your summer work takes you, we hope that CUR can help you! •

Meet the Councilors



Irene Reed is an associate professor of biology at the University of Saint Joseph (USJ) in West Hartford, CT. USJ is a small, liberal arts university with a focus on teaching and experiential learning. She earned bachelor's degrees in forensic

Science and biology at the University of New Haven and a PhD in biomedical sciences with a concentration in molecular biology from UConn Health. Her research focuses on studying cancer metastasis, specifically via regulation of signaling pathways involved in epithelial-

mesenchymal transition. Her projects focus on elucidating the role of gene modulators such as estrogen and microRNAs on the progression of breast and uterine cancers. Over the past eight years, she has actively engaged in research projects with undergraduates who have successfully obtained external grants, published manuscripts, and presented at regional and national conferences. To further integrate elements of undergraduate research into the curriculum, she has also developed CUREs in cell biology and cancer biology, and a Scientific Writing course, which focuses on critically reading and evaluating primary scientific literature. In 2018, she received the Reverend John J. Stack Teaching Excellence Award, which recognizes a faculty member at USJ for outstanding teaching. She has also served as co-chair for USJ's annual Symposium Day for the past six years, which features student research posters and oral presentations across disciplines, and is an active member of the Student Research and Creative Activities Committee. In fall 2018, she began her role as the co-principal investigator of a NSF S-STEM grant (USJ Catalyst Scholars Program) and is the site director for the PIE Fellowship Program, which places students into summer research experiences through a partnership with surrounding institutions. She also serves as director of the Health Professions Advisory Committee and facilitates several annual STEM-focused outreach events with middle school and high school students with the goal of exposing underrepresented populations and young women to science. •

National Conference on Undergraduate Research 2020 • Montana State University Bozeman • March 26–28, 2020

Meet the Councilors



Kristin Picardo earned her PhD in microbiology and immunology with a research specialization in bacterial pathogenesis in human disease at the University at Buffalo–SUNY. Her

teaching expertise is in general biology, microbiology, medical microbiology, information literacy, and research writing, with a special focus on first-year student success. She is the inaugural director responsible for building and overseeing St. John Fisher College's Center for Student Research and Creative Work that includes oversight of the Summer Fellows Research Program. She serves as principal investigator on an NSF S-STEM grant as well. As a Biology Division Councilor, she has served as a member of the advocacy group and the Posters on the Hill Committee, and is the current division secretary, divisional representative for the Finance Committee, and division newsletter co-chair. She also has reviewed for SPUR, Posters on the Hill, and the World Congress on Undergraduate Research. She is passionate about mentoring students in my lab where they study bacterial pathogenesis and especially enjoys watching them grow and become independent thinkers and scientists. •

Beginning a Research Program in the Natural Sciences at a Predominantly Undergraduate Institution Institute • Stetson University • Nov 22–24, 2019 • Application deadline: Oct 15, 2019 <https://bit.ly/BRP-Stetson>

Meet the Councilors



The graduate and postdoctoral training of **Aaron Putzke** is in the field of developmental biology where he focuses on how cells communicate

during differentiation using nematodes and zebrafish. Being at a PUI, Whitworth University, he enjoys the collaborative aspect of training undergraduates through research and preparing them for the next step in their career. He teaches courses ranging from Introduction to Cells and Genetics to Developmental Biology, Molecular Genetics, Genomics, and most recently a collaboration with a colleague in the School of Business to offer a Biotechnology Entrepreneurship course. He has enjoyed his time as a Councilor for the CUR Biology Division, where he has worked on advocacy, reviewed abstracts for Posters on the Hill, chaired the external review program for the division, and served on a CUR-wide task force to help define the role of campus liaisons for CUR. He finds that being a CUR Councilor has been an amazing experience in working toward common goals with peers from across the nation while using what he has learned to make an impact with colleagues on campus through increasing awareness and effectiveness of undergraduate research. •

Initiating and Sustaining Undergraduate Research Programs Institute • Miami University of Ohio • Nov 15–17, 2019 • Application deadline: Oct 1, 2019 <https://bit.ly/2p6UPms>

Meet the Councilors



Tara Phelps-Durr is a professor of biology at Radford University. Phelps-Durr received her bachelor's degree in biology from Truman State University and a master's and PhD in biological sciences

from the University of Missouri–Columbia. Subsequently, she completed her postdoctoral training at Cold Spring Harbor Laboratory. In 2006, she joined the faculty at Radford University as a geneticist.

Phelps-Durr is an advocate for creating a more inclusive, welcoming environment for STEM majors. As the project manager for Radford's CUR Transformations Project, she leads efforts to create a new biology curriculum that scaffolds undergraduate research throughout. Embedding undergraduate research into the curriculum ensures that all students have equal access to numerous, quality undergraduate research experiences. As the project manager for Radford's Howard Hughes Medical Institute Inclusive Excellence Award, known as Realising Inclusive Science Excellence (REALISE), Phelps-Durr leads efforts to provide faculty development focused on project-based learning and inclusivity, and she provides support for her colleagues as they create more engaging, inclusive courses. She also serves as a mentor for the REALISE students, a group of students who provide social and academic support to other students.

Phelps-Durr is a mentor for undergraduate students as they conduct research

both in and out of the classroom. Her research focuses on understanding how genes are regulated during plant development. Phelps-Durr's students computationally model the 3D structure of proteins and create CRISPR mutants in *Arabidopsis* to test the accuracy of the computational models. Students enrolled in her genetics course carry out semester-long projects that are a scaled-down version of the 3D modeling and CRISPR research. In the classroom, Phelps-Durr specifically aims to help students develop inclusive team practices and develop their science identity as they complete their research project. •

Growth of CUR Community College Participation: A Perspective

Diana Spencer (Tulsa Community College)

The June 2019 CUR Annual Business Meeting will be my final meeting after six years of working with some of the most dedicated researching faculty in the nation. I have been able to work as a Biology Division Councilor since the Community College Undergraduate Research Initiative facilitated my nomination in 2014. I have learned much from colleagues across the nation. Coediting the *CUR Biology News* since 2014 propelled me into the work and research passions of fellow Councilors. While serving on committees to select student travel awards and Posters on the Hill participants, I developed a discriminating preview of abstracts. The best part of inclusion in CUR was connecting with individuals interested in providing undergraduate research

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Community Colleges

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experiences for students in the first two years of postsecondary study. Community colleges have 36 percent of all first-generation students to attend college (AACC 2018) and 34 percent of all undergraduates (CCRC 2017). The health of our researching capacity depends on inclusion of these students in research initiatives. I have been able to present at the CUR Biennial Conferences and the URPD conferences most years since 2014 while focusing on two-year research case studies and the important connections between two- and four-year colleges. Tulsa Community College was able to grow its National Conference on Undergraduate Research participation from no student posters to posters involving 29 faculty and students during the University of Central Oklahoma hosting of the event in 2018. My capstone participation occurred this spring when I represented CUR as a consultant to San Francisco State College NIH Bridges grant work with four community colleges. I was able to work with a fellow Councilor whom I had not met previously, Mary Farwell (East Carolina University). We delivered a 1.25-day program with five talks concluding with plans for growth of the participating schools. Designing and delivering the program represents the best of my growth and connections to new colleagues. Much progress and growth has been made through participation and inclusion with CUR, and I look forward to the continued growth!•

References

American Association of Community Colleges. 2018. "AACC Fast Facts 2018."

<http://www.aacc.nche.edu/wp-content/uploads/2018/04/2018-Fast-Facts.pdf>

Community College Research Center. 2019. "Community College FAQs." New York: Teachers College, Columbia University. <https://ccrc.tc.columbia.edu/Community-College-FAQs.html>

A New CUR Biology Division Initiative Focused on Mentoring the Integration of Research into the Classroom

Michael Wolyniak (Hampden-Sydney College)

The Biology Division undertook a new initiative in 2018 that focuses on providing help for those who are looking to introduce authentic research experiences into their classrooms. Known as MIRIC (Mentoring the Integration of Research into the Classroom), the program seeks to form working groups of instructors with prior experience in developing course-based undergraduate research experiences (aka



CUREs or CREs) with new or veteran instructors who wish to develop CUREs of their own. Although MIRIC is hardly the first attempt by the scientific community to provide support for those seeking to develop CUREs, the program's long-term mentorship format lets its participants carefully develop new course materials and to put them into practice under the guidance of a seasoned veteran of the CURE

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MIRIC

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development process. It is this long-term exposure that allows mentees to develop CURE development skills that are sustainable and teachable to colleagues at their institution. To pilot MIRIC in the 2018–2019 academic year, the CUR Biology Division organized five working groups based on common course interests and geographic proximity. The groups were given the freedom to develop their own meetings and activities based on the specific needs of their members, and the entire group gathered online every month for discussion sessions and journal clubs focused on current literature on active learning and CURE development.

So far, MIRIC has been a great opportunity for groups of instructors of all ages and experiences to discuss their common interests in research as a form of experiential education for undergraduates and for instructors new to the practice to develop the skills and confidence necessary to develop their own CUREs. The CUR Biology Division is seeking to expand and sustain MIRIC through pursuing external funding through the National Science Foundation (NSF). While the division awaits the outcome of its funding proposal and the potential need for revisions, it also is recruiting a new cohort of mentors and mentees who wish to join the MIRIC community. Visit <https://www.cur.org/who/governance/divisions/biology/miric/> to learn more about MIRIC and to complete an application to either serve as a mentor or to receive mentorship. Questions may be directed to MIRIC Coordinator Michael Wolyniak (mwolyniak@hsc.edu).

CBE – Life Sciences Education as a Source for Research on Undergraduate Research

*Erin L. Dolan (Editor-in-Chief,
CBE–Life Sciences Education)*

National calls to improve higher education have emphasized the importance of undergraduate research. As a community whose main mission is to promote and support undergraduate research, we know its value. But what sources can we use to convince our colleagues of its importance? And where can we find research that helps us figure out how best to go about recruiting undergraduate researchers and supporting their growth and development?

A growing number of studies related to undergraduate research, including course-based undergraduate research or CUREs, is being published in the online open-access journal *CBE–Life Sciences Education* (LSE; <https://www.lifescied.org/>). LSE is a freely available journal published by the American Society of Cell Biology, a scientific society committed to [effective and inclusive undergraduate education](#). Although the focus of LSE is on education in the life sciences and STEM more broadly, the journal is a peer-reviewed source for education research that has applications and implications across disciplines.

In addition to its popular and practical essay series [Approaches to Biology Teaching and Learning](#) (Allen and Tanner 2002), authored by Kimberly Tanner and colleagues, LSE also has several new features that are likely to be useful to a broad audience of educators, including:

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LSE

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- [Evidence-Based Teaching Guides](#) (Wilson and Brame 2018), which distill education research into practical guides on topics such as group work, peer instruction, and inclusive teaching;
- [Anatomy of an Education Study](#), which are versions of LSE papers that have been annotated to make transparent various aspects of study design, methods, interpretation, and presentation using a Learning Lens pioneered by the American Association for the Advancement of Science [Science in the Classroom](#); and
- [Online with LSE](#), a virtual journal club with authors of *LSE* papers, which offer “behind the scenes” insights into how particular studies were done, including any implications for research and practice.

Because *LSE* is open access, there are no barriers to access and no fees. These recent papers related to undergraduate research and CUREs may be of particular interest:

- [Benefit–Cost Analysis of Undergraduate Education Programs: An Example Analysis of the Freshman Research Initiative](#)
- [Broadening Participation in Undergraduate Research Experiences \(UREs\): The Expanding Role of the Community College](#)

- [A Longitudinal Study of How Quality Mentorship and Research Experience Integrate Underrepresented Minorities into STEM Careers](#)
- [A Low-Intensity, Hybrid Design between a “Traditional” and a “Course-Based” Research Experience Yields Positive Outcomes for Science Undergraduate Freshmen and Shows Potential for Large-Scale Application](#)
- [Students Who Fail to Achieve Predefined Research Goals May Still Experience Many Positive Outcomes as a Result of CURE Participation](#)

These and other articles can be accessed on the journal website, <https://www.lifescied.org/>



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Subscribe to the
SPUR table of contents feed:
<https://bit.ly/SPUR-RSS>**

Upcoming Deadlines

CUR Events

See the CUR events page

<https://www.cur.org/what/events>

Conferences

Transforming STEM Higher Education.
November 7-9, 2019. Chicago. Registration
information

<https://www.aacu.org/registration-transforming-stem-higher-education>

ASM Conference for Undergraduate
Educators. August 1-4, 2019. Tysons, VA.
Registration information:

<https://asm.org/Events/ASM-Conference-for-Undergraduate-Educators/Home>

Grants and Awards

NSF Improving Undergraduate STEM
Education: Education and Human
Resources (IUSE: EHR), call closes
September 30, 2019, for *Exploration and
Design Tier for Engaged Student Learning &
Institution and Community Transformation*
https://www.nsf.gov/publications/pub_sum_m.jsp?WT.z_pims_id=505082&ods_key=nsf17590

NIH Research Enhancement Award (R15).
due dates June 25 and October 25 for most
applications.

<https://grants.nih.gov/grants/guide/notice-files/NOT-OD-19-015.html>

Sigma Xi Grants in Aid of Research (GIAR).
Deadline: October 1, 2019 (must be a Sigma
Xi member). <http://www.sigmaxi.org>

Fulbright Scholar Award: application due
for research and/or teaching abroad August

1, 2019, for the 2020–2021 academic year.
<http://www.cies.org>.

NEW from CUR!

Excellence in Mentoring Undergraduate Research



Excellence in Mentoring Undergraduate Research

Edited by Maureen Vanharman-Pfeifer,
Paul C. Miller, and Jesse L. Moore



CUR Council on Undergraduate Research

This cross-disciplinary volume incorporates diverse perspectives on mentoring undergraduate research, including work from scholars at many different types of academic institutions in Australia, Canada, the United Kingdom, and the United States. It strives to extend the conversation on mentoring undergraduate research to enable scholars in all disciplines and a variety of institutional contexts to critically examine mentoring practices and the role of mentored undergraduate research in higher education.

To order, visit the [CUR Bookstore](#) or [Google Play](#).