



58TH ANNUAL MEETING & ToxExpo · MARCH 10-14, 2019

SOT Undergraduate Educators e-Newsletter Volume 9, September 2018

2019 SOT Annual Meeting Information

**SOT [Education](#) and [Undergraduate Educator](#) Award Nominations
Due October 9, 2018**

To print and post: [SOT Undergraduate Programs flyer](#)

You and your students are encouraged to [submit](#) scientific and education poster abstracts for the SOT Annual Meeting.

Abstract deadline is October 19, 2018.

For tips on submitting education topic abstracts, please see the [Call for Education Abstracts](#).

Annual Meeting Registration Fee Waivers for Undergraduates

Undergraduates complete and send the [Registration Form](#) with a copy of their student ID to [Jim Dailey](#), Meeting Registrar, via email or fax: 703.438.3113, to request a registration fee waiver.

Sunday Undergraduate Education Program

Any undergraduate registering for the March 2019 SOT Annual Meeting can check the box to participate in the Undergraduate Education Program on Sunday, March 10. Special lectures on topics in toxicology, time with mentors, and sessions for career and academic guidance are activities during the day-long program. This program has a substantial impact on students, as evidenced by quotes from the feedback forms below:

"I would like to thank SOT for arranging the program for undergraduates. The Sunday Education Program was my favorite part of the meeting— full of engagement, critical thinking and active discussion, a great learning process."

"I am really thankful to have had the opportunity to attend the meeting, learn about relevant opportunities in neurotoxicology, make new friends and connections. I look forward to being part of the SOT meetings in the future!"

Isola Brown tells the impact of her participation in the SOT Undergraduate Program in [this blog](#).

Undergraduate Funding Opportunities

SOT funding provides support for travel, lodging, and access to special undergraduate activities at the SOT Annual Meeting. **Deadline for most undergraduate award applications is October 19.**

Undergraduate Diversity Student Award Undergraduate Diversity Advisor Award

Students are selected to attend the 3-day Undergraduate Diversity Program and receive travel funding and lodging. Students must be US citizens or permanent residents and meet at least one of these criteria among others: from a racial/ethnic group that is under-represented in the sciences (e.g., African American, Hispanic, Native American, Pacific Islander), first generation college, from an institution that qualifies for an NIH AREA grant, or a member of an underserved population.

Faculty advisors who are not SOT members and mentor students who are eligible can also apply.

- [Student Information and Application Materials](#)
- [Institutions Not Eligible](#) for NIH AREA grants (students at these institutions are eligible if they meet another of the criteria) 
- [Advisor Information and Application Materials](#)

Pfizer SOT Undergraduate Student Travel Award

Undergraduate students who [submit abstracts](#) for posters can apply for this award. Abstracts are due October 19. Awardees receive travel support, registration for the meeting, and special recognition from Pfizer.

- [Information and Application Materials](#)

Perry J. Gehring Diversity Student Travel Award

Students who 1) received the Undergraduate Diversity Award within the last three years, 2) [submit an abstract](#) for the meeting, and 3) are from racial/ethnic groups under-represented in the sciences can apply for this travel award.

- [Information and Application Materials](#)

Diversity Initiatives Endowment Career Development Award

Undergraduate Student Affiliates and Graduate Student members from groups under-represented in the sciences can apply for up to \$1000 funding to support personal and professional development experiences.

- [Information and Application Materials](#)

Encourage your students to check out all the [SOT programs for undergraduates](#).

Recap of SOT 2018: *In Vitro* Toxicology Lecture and Luncheon

More than Skin Deep: When Alternative Approaches Out-Perform Animal Tests
Speaker: Dr. Nicole Kleinstreuer

One of the highlights of the 2018 SOT meeting was the [In Vitro Toxicology Lecture and Luncheon](#), which is supported by an educational grant from the Colgate-Palmolive Company and hosted by the Education Committee. There were approximately 230 undergraduate and graduate students and

postgraduate scholars who participated in the event, with about 60 table hosts from industry and academia with interests and experience in the development of *in vitro* methodology, including recipients of SOT Colgate-Palmolive awards. Dr. Kleinstreuer's lecture was followed by an interactive activity which initiated discussion amongst the participants on the use of *in vitro* skin tests to replace animal ones. The materials from the lecture can be found [here](#).

2019 SOT Annual Meeting Education Platform Session:



We are pleased to announce the education platform session at the 2019 Annual Meeting will focus on “Models and Strategies for Building Diversity and Inclusion in Toxicology.” The session will bring together leading experts from SOT, the National Institutes of Health, and the University of Maryland, Baltimore County, Meyerhoff Scholars Program to share successful models and strategies for recruitment and retention of STEM trainees and career development toward independent research careers. The session will conclude with questions from the audience and a general discussion of inclusion and diversity in toxicology training. We look forward to seeing you at this session in March!

Undergraduate Education Subcommittee Grants to Broaden Student Participation in Regional Chapter Meeting

After a successful pilot program with the Northeast and Ohio Valley Regional Chapters (RC) last year, the Undergraduate Education Subcommittee is pleased to announce a new grant program to increase undergraduate student participation at Regional Chapter meetings. The goals are to 1) provide an opportunity for undergraduate awareness of toxicology at the regional level through structured programming, 2) facilitate a non-academic mentor match for students with a RC member in either government or industry, and 3) identify and cultivate undergraduate candidates for participation in the national meeting. If you are interested in more information this program, please contact [Larissa Williams](#), [Emily Ford](#), or [Christine Curran](#), or view the [description and application](#) to learn more about the program. Proposals from RC were due August 31.



Undergraduate Educator Network Webinars

This past January, the SOT Education Committee and the SOT Undergraduate Education Subcommittee sponsored a webinar entitled, “Don’t Sweat It...Three Dry Labs for Undergraduate Toxicology Programs.”



The webinar featured broad spanning examples of toxicology lab exercises that do not require pipetting or running gels or injecting mice, but rather make use of *in silico* and active learning approaches to illustrate and reinforce key toxicology aspects. Three speakers were featured and each described a dry lab that they successfully use in their teaching.

The first presenter (Dr. Vanessa Fitsanakis, Northeastern Ohio Medical University) explained how to incorporate statistical tools for “big” data set analyses. The pedagogical aim of determining whether or not data sets derived from experimental toxicology analyses are statistically significant was stressed throughout her portion of the webinar, along with excellent pointers and examples of how and when to implement statistical tests such as F-tests and ANOVAs.

The second presenter (Dr. Kai Low, St. John’s University) described how to incorporate bioinformatics tools for protein function assessment. His lab provides students with a visceral sense of the enormous amount of informatics-based data that is available to students at the click of a button.

The third presenter (Dr. David Reif, North Carolina State University) detailed how to present a code-based course to students with no previous coding experience for the purpose of biological and toxicological-based computational analyses.

All in all, it was a pedagogically rich and creative webinar that offered practical suggestions for new dry labs. It’s not too late to watch the webinar! It has been [archived](#) and is freely accessible.

The SOT Undergraduate Education Subcommittee offers sincere thanks to the Education Committee and to SOT for their support of this important educational tool. Give it a look and perhaps you, too, will be able to incorporate one or more of these dry lab exercises and active learning approaches to enhance the overall learning experience of your toxicology students! The recording and slides are available for all [UEN webinars](#).

Undergraduate Research Experiences for STEM Students: Successes, Challenges, and Opportunities

The National Academy of Sciences report “[Undergraduate Research Experiences for STEM Students](#)” provides a comprehensive overview of and insights about the current and rapidly evolving types of Undergraduate Research Experiences (UREs), in an effort to improve understanding of the complexity of UREs in terms of their content, their surrounding context, the diversity of the student participants, and the opportunities for learning provided by a research experience. This study analyzes UREs by considering them as part of a learning system that is shaped by forces related to national policy, institutional leadership, and departmental culture, as well as by the interactions among faculty, other mentors, and students. The report provides a set of questions to be considered by those implementing UREs as well as an agenda for future research that can help. The [website](#) includes links to presentations made at the public launch.

Grants Program for Undergraduate Educators

Last year the Education Committee and Undergraduate Education Subcommittee piloted a plan to fund four \$500 Grants for summer 2018 or beyond for faculty with major responsibilities in the education of undergraduates. This funding will be available in 2018-2019 as well. There are two



Two undergraduates conducting research at Northern Kentucky University.

categories of activities that the grants can support: student research in toxicology or for professional development to increase the success of toxicology faculty. For professional development, the Grant might be used to purchase a yearly membership in, or participate in activities of, the [National Center for Faculty Development and Diversity](#), a nationally recognized program for providing on-demand mentoring, tools, and support that help us be successful as educators and

scholars. In this first year of the program, for student research, priority was given to funding ongoing or future summer projects involving undergraduates and to those applications that had a robust recruitment plan for students from backgrounds that are historically underrepresented in science.

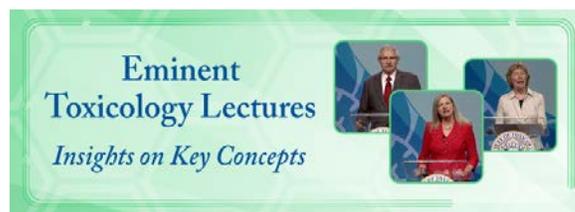
The committee funded four proposals, in each case providing funding for laboratory materials to support undergraduate summer research projects.

David Blake at Fort Lewis College, a Native American-serving but nontribal institution, will be working with an undergraduate to progress his ongoing research on the mechanism of action by which derivatives of caffeic acid lead to cell death in prokaryotic and eukaryotic cells. Michael

Borland of Bloomsburg University of Pennsylvania will use the funds to support a junior-year student research project. The student will contribute to a study of a previously characterized isosteric selenium derivative of the PPAR β/δ agonist GW501516 and its effects on cell growth, transcriptional regulation, and oxidative stress in human malignant melanoma. At the Massachusetts College of Pharmacy and Health Sciences, Greg Landry will use the funds to support an undergraduate student project investigating the combinatory effects of Pb²⁺ and calcium oxalate on primary human proximal tubule epithelial cells to assess renal toxicity. Carin Thomas (Central Washington College) will purchase laboratory reagents to support the project of a STEP (Science Talent Expansion Program) sophomore student investigating the adverse effects of phthalates in mouse liver cell lines.

The announcement of the 2018-19 deadline for this program will be made later this year.

Eminent Toxicologist Lectures and Curriculum Resources Now Available



The Eminent Toxicologist Lectures are historically relevant, high-quality presentations appropriate for upper level undergraduate students, graduate students, or the scientifically-oriented general public. This series of lectures was produced by the SOT Undergraduate Subcommittee of the Education Committee in conjunction with the Eminent Toxicologist Work Group.

All fifteen of the current lectures can be found on the [Eminent Toxicology Lecture site](#) for free - no SOT membership needed.

Who was recorded? Fifteen lectures from eminent toxicologists are now part of the collection.

- **Dr. Yves Alarie** "QSARs to Commemorate the 50th Anniversary of the RD₅₀"
- **Dr. Marion Ehrich** "Pesticide Neurotoxicity More or Less"
- **Dr. Nancy Monteiro-Riviere** "Frontiers in Nanotoxicology of the Skin"
- **Dr. Melvin Andersen** "45 Years Modeling Dose-Response Relationships: An Unanticipated Career!"
- **Dr. John Doull** "How Toxicology Became an Academic Discipline"
- **Dr. Ernest Hodgson** "We Are Not Rodents: Environmental Toxicants and the Role of Human Studies"
- **Dr. Curtis Klaassen** "How Do We Adapt to Chemicals?"
- **Dr. Kenneth Ramos** "Reprogramming of the Human Genome by Toxic Injury"
- **Dr. Cheryl Lyn Walker** "Environmental Epigenomics: The Developmental Origins of Health and Disease"
- **Dr. William Benson** "Exploration of the Interconnections between Human Health and Ecological Integrity"
- **Dr. Samuel Cohen** "Chemical Carcinogenesis"
- **Dr. Jack Dean** "Immunotoxicology: A Historical Perspective"
- **Dr. Michael Gallo** "From Murder to Mechanisms: 7000 Years of Toxicology's Evolution"
- **Dr. Alan M. Goldberg** "Humane Science in Risk Assessment and Beyond"
- **Dr. Ruth A. Roberts** "Regulatory (Pharmaceutical) Toxicology"

What curriculum materials are available? Lecture notes and learning objects for most lectures are available [here](#). More content, including assessment items, will be added in the future. Assessment items will also be available. These are correlated to the NSF AAAS [Vision and Change](#) Core Concepts and Competencies in Undergraduate Biology.

Are You Teaching an Undergraduate Toxicology Course This Year?

by Joshua Gray, US Coast Guard Academy

Whether you're teaching a brand-new undergraduate toxicology course or are a veteran undergraduate toxicology educator, there are some great resources available for you through the SOT website. The [Eminent Toxicologist lecture series](#) provides freely available recorded lectures by some of the most eminent toxicologists in a variety of subdisciplines. These lectures are designed for use in the later portions of undergraduate courses and serve as alternatives to in-person guest lectures. They can also be used in a flipped classroom format, wherein the students watch the lecture on their own and the professor uses the class period to discuss the lecture. Each lecture includes study questions and learning objectives designed by fellow educators. Together with the Tox Scholar program, these lectures are an excellent way to get outside experts into your classroom.

Newly available this year are [Undergraduate Toxicology Learning Objectives](#) (LOs) for building a new undergraduate toxicology course from scratch or to augment/redesign an existing undergraduate toxicology course. These LOs were based on an analysis of syllabi of undergraduate toxicology courses and are designed in the format of [Vision and Change](#). To use them, an educator first decides the focus of the toxicology course, such as industrial hygiene, pharmacology, or environmental, and then chooses the learning objectives to emphasize that are most relevant to that course type. The LOs describe what students will be able to accomplish following coverage of the course content and provide examples and case studies useful to teach that content. It is not anticipated that a single course will emphasize all LOs; rather, each course will be tailored to particular content depending on the focus of that course. Ultimately, these LOs will be published at websites that will help promote toxicology content to other life science educators.

Finally, the Undergraduate Educator Network (UEN) available at ToXchange is an online discussion board used by undergraduate educators across the nation. If you're seeking advice about an education-related topic, the UEN is the best place to seek advice. Once you've taught your course, you can share your successes (and lessons learned) at the UEN and by uploading your course materials to pay it forward to other educators.

See you at the [website](#)!



Join the Undergraduate Educator Network

- Log into ToXchange
- Select "my options" under your name at the right top
- Select "my subscriptions"
- Select the + on the left
- Select categories="committees"
- ADD "Undergraduate Educator Network discussions" in the box at right

Contact sothq@toxicology.org for assistance with ToXchange or membership.

Video tutorials for Career Development from ASBMB



The American Society for Biochemistry and Molecular Biology (ASBMB) has a variety of fabulous career development videos covering topics such as tips for informational interviews, networking for scientists, and dressing professionally for women and men. Check them out [here](#) and [here](#)!

Designing an Undergraduate STEM Course



ADVANCING SCIENCE. SERVING SOCIETY



AAAS has developed a course that helps participants learn a framework for designing an undergraduate STEM course that may be applied at different institutions and at all levels of undergraduate learning in STEM. This is a framework that starts with thinking about your students and what they need to learn in your course. Other topics covered include: defining goals for student learning, selecting and organizing content, designing assignments, assessments and teaching methods, creating a schedule and syllabus and reflecting on and refining your course. Please visit this [website](#) for more information.

Ideas for the SOT Undergraduate e-Newsletter?

Contact [Alicia Timme-Laragy](#), [Emily Ford](#), or [Rebecca Dearman](#).

Published by the Undergraduate Education Subcommittee of the SOT Education Committee

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