



60th Annual Meeting & ToxExpo  
March 14–18, 2021 • Orlando, Florida

## SOT Undergraduate Educator e-Newsletter    Volume 11, September 2020

### SOT's FUTURE is US!

Dear Colleagues:

What a whirlwind the past six months have been! In March 2020, institutions of higher education rapidly transitioned to remote learning and as the fall 2020 semester begins there is a diverse range of pedagogical approaches including being entirely face-to-face, to being hybrid or completely remote. Through these times the Society of Toxicology (SOT) Faculty United for Toxicology Undergraduate Recruitment and Education (FUTURE) committee members have continued to work diligently to promote programs for faculty, students, Special Interest Groups, Regional Chapters, and the membership in general.

The SOT sponsored undergraduate internship program turned almost entirely virtual with only a small number of institutions being able to safely provide in person research experiences. We praise all the participating institutions for putting together substantial programs for the undergraduates and providing them with valuable experiences to help in the recruitment and development of the next generation of toxicologists. We encourage institutions with summer undergraduate research programs to apply for SOT [internship matching funding](#).

FUTURE continues to grant opportunities for faculty to support [professional development](#) and undergraduate [research projects](#). We support both the Domestic and International [ToxScholar](#) programs and with many institutions being virtual or hybrid this is an excellent opportunity to look towards our SOT membership community as resources in the classroom. We offer [grants](#) to Regional Chapters to expand involvement of undergraduates. The [SOT Travel Award](#) provides an opportunity for outstanding undergraduates to present at the Annual Meeting which has a deadline of Oct 26. Lastly, we provide fantastic programming for faculty and undergraduates at the Annual Meeting, including symposia and a special poster session.

Please contact me if you need more information or help taking advantage of what FUTURE has to offer you and your students.

[Mindy Reynolds](#)

Chair, FUTURE Committee

## SOT Annual Meeting Information



### Upcoming Deadlines

**October 9:** SOT Education and Undergraduate Educator Award [Nominations](#)

**October 26:** Undergraduate Award [Applications](#)

**December 1:** [Abstract Submission](#)

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

### Matching Funding for Undergraduate Internships

Undergraduate students are future graduate students and toxicologists. SOT has a goal of enhancing recruitment of students into toxicology. To help facilitate this, FUTURE will fund undergraduate intern hosts to enable additional undergraduate summer internships in toxicology (assuming at least a 50% matching from the host institution or other funding sources). The intent of this program is to increase opportunities for summer research in toxicology by capitalizing on existing programs. Preference will be given to institutions demonstrating success in current summer internship programs and those recruiting from student groups typically under-represented in the sciences.

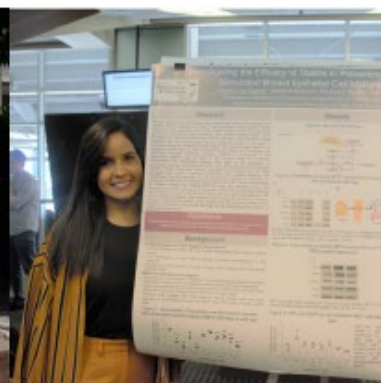
Host applications will be due **January 8**. For more information see [Internship Program Support](#).



2019 Louisiana State University Health Sciences Center intern  
Joel Ennis



2019 Rutgers interns Talia Seymore, Shabree Anthony, and Jaylen Taylor



2019 Michigan State University intern Anais Cruz

## Undergraduate Awards

SOT has a variety of awards to support undergraduate student attending the Annual Meeting and other activities. The deadline is **October 26** for the SOT national undergraduate awards. See the [Awards for Undergraduate Students](#) page on the SOT website for a complete listing including component group awards.

### 1. **SOT funding provides support for travel, lodging, and access to special undergraduate activities at the SOT Annual Meeting.**

#### Undergraduate Diversity Student 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: 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 does not have biomedical graduate degrees, or a member of an underserved population.

- [Student Information and Application Materials](#)



### 2. **Other Funding**

#### Diversity Initiatives Endowment Career Development Award

Undergraduate Student Affiliates and Graduate Student members from groups underrepresented in the sciences can apply for up to \$1,000 funding to support personal and professional development experiences. Applications accepted any time but no later than **May 1, 2021**.

- [Information and Application Materials](#)

#### SOT Undergraduate Student Travel Award

Undergraduate students who [submit abstracts](#) for posters can apply for this award. Abstracts are due December 1. Awardees receive travel support, registration for the meeting, and special recognition.

- [Information and Application Materials](#)

#### Perry J. Gehring Diversity Student Travel Award

Students who 1) received the Undergraduate Diversity Award within the last four 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](#)

## RC4 Undergraduate Travel Award

The Regional Chapter Communication and Collaboration Group (RC4) is pleased to announce its 2021 Undergraduate Travel Award. The award provides an undergraduate student with a needs-based travel grant that enables them to attend the SOT Annual Meeting and present a poster of a toxicology-related project. The applicant applies to the Regional Chapter. A single electronic PDF file with a completed application should be emailed to the appropriate Regional Chapter by **October 18**. Regional Chapters submit their selected candidates to RC4 by **October 26, 2020**. More information, including the guidelines for the award, can be found in the [RC4 Award](#) description.

## Funds Available to Promote Toxicology in Developing Countries

**Blase Billack**, St. John's University

Are you a SOT member? Have you ever considered visiting a developing country for the purpose of spreading joy and enthusiasm regarding toxicology?

If you answered yes to those questions, then the SOT International Toxicology Scholar Award is the travel award for you! Due to the pandemic, well-thought out virtual events with modest budgets related to online delivery will be considered. Applicants are encouraged to seek matching funds from partners, whether a SOT Special Interest Group, employer, or host institution. A letter from the contact at the institution to be visited is required and letters from sponsoring partner(s) would be included as part of the application.

The deadline is **October 9**. For more information, please go to our [International ToxScholar website](#) and/or contact [Blase Billack](#).



Gurjot Kaur in India



Nitin Verma in Nepal



Vijay Kale (in suit) in India

## Help Recruit the Future with an Undergraduate Faculty Grant

SOT recognizes the instrumental role that we undergraduate educators play in the recruitment of future toxicologists and supports the [SOT Undergraduate Faculty Research Grant](#) and the [SOT Undergraduate Faculty Development Grant](#). These grants provide up to \$1,500 in support for an undergraduate research project research or a faculty professional development endeavor. You can find more information about these awards on the [SOT website](#). Applications are due **March 26, 2021**, for projects in summer 2021 or in the 2021-2022 academic year.

In the 2020 funding cycle, Dr. Gurjot Kaur (Faculty Research Grant) and Dr. Nitin Verma (Faculty Research Grant) plan to engage undergraduates in impactful laboratory experiences. Their efforts, and the efforts of so many others, will help ensure the strength of our society for years to come. Let's all work to help keep SOT's future bright!

Please consider applying for a SOT Undergraduate Faculty Research or Development Grant for summer 2021 or 2021-2022 academic year. Help yourself, help your students, and help recruit for the future of toxicology!

## SOT 2020 Virtual Meeting Activities Engage Students

Many of us awaited an engaging SOT 2020 Meeting in beautiful (and magical) Anaheim, California. Alas, it was not meant to be. Many innovative and dedicated SOT members created virtual programming and opportunities for undergraduate students. Some of these included:

**Pfizer SOT Undergraduate Award Recipient Virtual Presentations:** SOT FUTURE ensured that the students selected for these prestigious awards had the high-impact opportunity to present to a scientific audience as part of the Virtual Undergraduate Education Program. While different than past presentation opportunities, awardees rose to the challenge of presenting in a virtual environment. Twelve students gave five-minute research overviews followed by Q&A. Organizers were impressed with the ability of the student awardees to develop informative slides and summarize their results in a short period of time.

**Virtual Undergraduate Program:** The Committee on Diversity Initiatives (CDI) organized virtual events for undergraduates. Students registered for the Undergraduate Diversity Program (UDP) and the Undergraduate Education Program could review the recorded lectures prior to an online discussion with the speakers. In a second session, the UDP recipients discussed graduate school in small groups with graduate student and academic program facilitators. According to survey feedback, the students especially appreciated the small group discussions with toxicologists.

FUTURE hopes to see everyone at SOT 2021. If not, we look forward to delivering SOT programming to students and faculty in many engaging and impactful modalities!!



## Teaching in a Pandemic: The Masked...the Virtual...the Hybrid

2020 may prove to be the shining hour for STEM (and toxicology) in higher ed! Our ability to pivot and innovate during a pandemic has been truly inspiring. Faculty have gone to extraordinary measures to ensure that student learning objectives are met. Here we highlight three FUTURE members who have taken different approaches, whether by choice or by university decision.

### The Masked

This fall, the US Coast Guard Academy (CGA) remains open and in-person due in part to the military need for readiness and to graduate officers—closing is not an option. To accomplish this, the Science Department at the CGA volunteered to establish a COVID-19 surveillance program in which 2% of the asymptomatic population is assessed each day, and I've participated by establishing the biochemical testing methodology and running the samples in my research laboratory. Surveillance testing by non-clinical laboratories is permitted by the FDA in times of emergency, and the CGA has decided to employ surveillance testing to detect emerging outbreaks in asymptomatic individuals. Using this information, the medical command at the CGA has a better picture of the overall health and readiness of the faculty, staff, and students at the CGA.

Over the past few years, I have changed the way I have taught Biochemistry lab to an evidence-based teaching method called "Course-based Undergraduate Research Experience (CURE)," in which students participate in an authentic research experience. In previous semesters, this course has focused on the *C. elegans* model system. This semester, the focus will instead be on COVID-19 biochemical testing techniques and their use for the purposes of keeping the CGA open. While students may not run tests directly on human samples, environmental samples are permissible. By coordinating with the Civil Engineering Department, we have ready access to sewage from the single dormitory on our campus; sewage may be a good surrogate for viral burden in a population, for example. Students have been asked to find alternative ways to conduct COVID-19 surveillance, find literature supporting their approach, and propose a solution. The best solutions will be performed this semester and the data provided to the CGA clinic to support their ongoing surveillance efforts. Along the way, students will also perform FDA Emergency Use Authorization-based real time RT-PCR assays which are readily available for SARS-CoV-2 detection. The students will also write and orally communicate their findings to their peers, building compliance and trust in the scientific process of the surveillance program. Overall, we are very excited about this novel CURE approach to teaching this semester!

[Joshua Gray](#) is a member of the SOT FUTURE Committee. He is a Professor of Chemistry and Section Head of Chemistry at the United States Coast Guard Academy.

## The Virtual

Washington College is a small liberal arts college on the Eastern Shore of Maryland, and it prides itself on the fact that all science classes have corresponding labs. When Washington College announced they were going entirely remote there was immediate panic as to how I was going to teach labs; I was specifically worried about my Biochemistry course. Over the last 10 years I have flipped the lecture for this course to allow for class time to be used to work through problems, discuss case studies, or for individual questions. The lab has been very skill-based, many of which could not be translated to remote learning. I have taken the summer to completely redesign the lab objectives to include kitchen-based experiments, critical analysis of patient medical data, data analysis with Excel skills, and interpretation of primary literature. Though the objectives of the course look different than in the past, I am still hitting the core competencies that are important for Biochemistry. The fall will be exciting during these uncertain times, but I am looking forward to trying some innovative ideas and continuing to engage with the students.

[Mindy Reynolds](#) is currently Chair of the SOT FUTURE Committee and at Washington College she is Chair of the Department of Biology and the Natural Science Division as well as Co-Chair of the Biochemistry and Molecular Biology major.

## The Hybrid

Bloomsburg University of Pennsylvania (BU) is part of the 14-member Pennsylvania State System of Higher Education. Bloomsburg is in rural north central Pennsylvania and enrolls over 8,000 students, including many first-generation, Pell-eligible, and/or minority students. Our STEM programs take pride in lecture/lab combined courses that are faculty taught and provide hands-on experiences with instrumentation. When the pivot happened in the spring, I quickly adapted writing-intensive Biochemistry 1 and Biochemistry 2 lecture/lab courses to a complete online modality. It was scary and stressful, but I survived!! With the summer to plan, I chose a synchronous Zoom lecture format and I honed-in (with the help of colleagues) on essential hands-on laboratory skills for Biochemistry 1. Lab would feature alternating in-person attendance. Live labs focused on skills like biomolecule isolation/purification techniques, electrophoresis, and accuracy/reproducibility in quantitative bioanalytical assays. A lot of effort went into lab redesign for a safe and socially distanced experience with shared instrumentation. “Remote week” asynchronous group labs, which include some instructor filmed data/results, include experiences in protein structure/folding, the reactivity of sugars, and membrane lipid composition. I am excited to see the evolution of these labs to provide a safe learning environment while still meeting the standards of our accrediting bodies (American Chemical Society and American Society of Biochemistry and Molecular Biology (ASBMB))!

Michael Borland is a member of the SOT FUTURE Committee, an ASBMB Education Fellow, and Professor of Chemistry & Biochemistry at Bloomsburg University.

Undergraduate Educator Network e-Letter September 2020

## Toxicology Educator? Here are Some Resources for You!

As an undergraduate educator, you are at the forefront of bringing toxicology to the next generation of professionals. The Undergraduate Educator Network (UEN) is a community of toxicology scholars who all have a common purpose in helping our students achieve their dreams of a safer and healthier tomorrow. SOT has assembled a collection of educator resources and these are freely available to the UEN. Some of these resources are listed below and more details concerning each of them can be found [here](#). Have a look and see what you can incorporate into your teaching.



Clipart from: <https://mymsic.org/links>  
MathScience Innovation Center; Richmond, VA  
USA; accessed 8/17/2020

- [Toxicology Learning Framework](#)—provides main learning concepts for toxicology and would provide insight for an instructor determining how toxicology might fit into the concepts they teach in various courses. The final column in the framework provides links to specific teaching resources for that concept.
- Webinar: [Adopting the Undergraduate Toxicology Learning Framework](#)
- [SOT Curriculum Materials](#)—numerous examples; here's one:
  - Introduction to Toxicology Debate: This is an activity that can be used in an introductory toxicology course. It allows the students to go into more detail about particular topics and also enables them to become more comfortable working in groups. Sample debate topics have been provided.
- [Eminent Toxicologist Lectures](#): The Eminent Toxicologist Lectures are historically relevant, high-quality presentations appropriate for senior undergraduate students, graduate students, or the scientifically oriented general public. Each lecture is accompanied by learning resources, including lecture notes and learning objectives.
- [Introduction to Toxicology Slides](#)
  - [General Introduction to Toxicology](#) (10 slides)
  - [Toxicology as a Discipline](#) (14 slides)
  - [Toxicology Concepts](#) (25 slides)
  - [Careers in Toxicology](#) (17 slides)
  - [SOT Information and Summary](#) (6 slides)
- [Undergraduate Educator Network Webinars](#): Numerous webinars; click the link to learn more



- [In Vitro Toxicology Lectures](#): Short presentations that provide the background for case studies that can be used in formal courses.
- Numerous SOT [Annual Meeting session recordings](#) and [webinars](#). Get lots of new ideas for your teaching!!
- SOT [Statements](#): Toxicology Impact Statements, Issue Statements, Express Statements. Keep your students up-to-date with the views and wisdom of the SOT!
- [Domestic ToxScholar Program](#): Toxicologists visit primarily-undergraduate campuses (in-person or virtually) to present toxicology content relevant to chemistry, biology, and environmental science courses; in addition the speaker often meets informally to discuss career paths in the biomedical sciences.
- SOT Undergraduate Affiliates (undergraduates can register for this status at no cost) can request access to the SOT Continuing Education library [CEdTox](#).

### Other Science Resources

The resources listed below are external to SOT. Inclusion in this list does not constitute an endorsement by SOT.

- [ToxMSDT e-Modules](#)
- [NLM ToxTutor](#)
- The American Chemical Society (ACS) recently sponsored a webinar entitled, “Teaching Remotely Together, Lessons Learned” which put together a large list of resources for online teaching, something that many of us experiencing now during the CoViD-19 pandemic.
  - [Learning Assistants in e-learning](#)
  - [Minecraft Chemistry](#)
  - [Online Resources for Remote Science Laboratories](#) (POD)
  - [Open Learning Initiative](#)
  - [People Behind the Science](#)
  - [Scientist Spotlight](#)

Simulations included as:

- [American Association of Chemistry Teachers](#)
- [ChemDemos](#)
- [Gizmos](#)
- [PhET simulations and lessons](#)
- [SimBio](#)

- Early career [educator webinars](#) are available from the American Society of Microbiology (ASM). The webinar series is based on ASM's Science Teaching Fellows Program (2012-2017), which prepared over 270 early-career scientists for teaching-related careers at nondoctoral colleges and universities. This 6-webinar series is available as an on-demand package or as individual webinars. Registration and access to the webinars begins May 18. All participants who register will be granted access to the course materials until January 31, 2021.
- [ABRCMS Online](#), part of the Annual Biomedical Research Conference for Minority Students (ABRCMS), includes a 5-part self-study and on-demand series for students (all levels), postdoctoral scientists, early/mid-career professionals, faculty, program directors and administrators, and instructional designers. The series offers guidance and perspectives on the impact of COVID-19 on the training and scientific maturation of students underrepresented in the biomedical sciences.
- [ASPIRE](#), the National Alliance for Inclusive & Diverse STEM Faculty, seeks to assist faculty in STEM academic advising. *ASPIRE's A Guide to Academic Advising for STEM Faculty* provides an overview of advising, core competencies to address the academic needs of students, and tools to help faculty be effective advisors for a diverse population of students.
- [Beyond Benign](#) is a resource dedicated to green chemistry education. Green chemistry is the design of chemical products and processes that reduce and/or eliminate the use or generation of hazardous substances. This approach requires an open and interdisciplinary view of material and product design, applying the principle that it is better to consider waste and hazard prevention options during the design and development phase, rather than disposing, treating and handling waste and hazardous chemicals after a process or material has been developed.
- [USA Science and Engineering Festival](#) includes a library of free videos featuring engaging presentations by their XSTEM Speakers and Science Festival performers.
- [EDUCAUSE](#) is a resource page to help higher education institutions plan for response to COVID-19, including practices as well as learning resources.
- [Online Resources for Remote Teaching Science Laboratories](#) provides a listing of links for free and not-free virtual labs and simulations.
- [LabXchange](#) is a Harvard-supported online community for learning, sharing, and collaboration, curating and creating digital content, including videos, learning exercises, and interactive resources.

If you know of a link or resource not listed here that would be of general interest to the Undergraduate Educator Network, please email to [Betty Eidemiller](#).

## SOT FUTURE Member Profile: Dr. Gunnar Kwayke

This newsletter highlights one FUTURE member in every issue. SOT members can find the full list of FUTURE Committee members [here](#). Gunnar Kwakye, PhD, is Associate Professor Neuroscience, Oberlin College and Conservatory, Oberlin, Ohio.

### **Question (Q): Please describe your toxicology journey from student to faculty member.**

Gunnar Kwayke (GK): I have always been intrigued by nature-nurture interactions in human diseases, especially neurological disorders. As an undergraduate student, I was fortunate to have worked in an analytical chemistry lab investigating the role of heavy metals exposure in causing cardiomyopathy in pygmy and beluga liver whales. This research experience introduced me to the idea of how toxicants may negatively impact the function of living organisms. During my graduate and postdoctoral training, I combined my interests in neuroscience and toxicology to better understand the role of environmental factors, specifically exposure to heavy metals in neurodegeneration. I



was privileged to have been trained and mentored by leaders in neurotoxicology, including Dr. Aaron Bowman and Dr. Michael Aschner, who helped me to further develop my interest in neurotoxicology and neurodegeneration. As a faculty member in the neuroscience department at Oberlin College, I've been teaching, training, and mentoring undergraduate students. My lab studies disease-toxicant interactions underlying neurodegenerative diseases, specifically Parkinson's disease, Multiple System Atrophy, and Huntington's disease.

### **Q: In a few sentences, which is difficult to do, please tell us about your research.**

GK: In general, I would say all the most difficult parts of my research are necessary for providing students with the skills required to succeed in research, medicine, and other careers. Training students to conduct aseptic techniques using mammalian tissue culture models of various neurodegenerative diseases and helping students balance their time spent in the lab versus coursework and other experiential learning activities can be difficult. However, with patience, dedication, effective strategies, and perseverance, students are able to master the cellular/molecular and biochemical techniques as well as learn how to be efficient in the lab and their coursework.

**Q: What has serving on the FUTURE Committee meant to you?**

GK: Serving on the FUTURE Committee has been an invaluable experience for me. I have cherished working with my fantastic colleagues on the FUTURE committee who are committed to promoting toxicology education for undergraduates. In general, several of the goals of the FUTURE committee align with my personal goals for teaching, training, and mentoring students. Thus, I truly enjoy serving on the FUTURE committee.

**Q: What are some of your biggest challenges in teaching toxicology to undergraduates and capturing their interest?**

GK: I consider myself lucky to have had minimal challenges capturing the interests of undergraduates at Oberlin College whenever I've had the opportunity to teach toxicology. My biggest challenge is having the opportunity to incorporate a toxicology course in my annual teaching load. I've been able to combine toxicology and neuroscience into an upper level neurotoxicology course for the neuroscience majors. Additionally, I've been grateful to have had the opportunity to develop and teach multiple non-majors courses with a strong emphasis on introduction to toxicology, global health, public health, human diseases, etc. These courses have been popular and considered by some students a gateway for them to learn about toxicology and its connection with other disciplines. Several students from my non-majors' courses have also enrolled in my upper level neurotoxicology course and worked in my research lab.

**Q: What was your most memorable SOT meeting?**

GK: My most memorable SOT experience was when I attended SOT with my undergraduate mentees who were selected to receive the Pfizer SOT Undergraduate Travel Award. I remember how grateful they were to SOT and their research mentor for giving them the opportunity to present our research at a national scientific meeting and for believing in them. I remember how knowledgeable, confident, and professional my undergraduate mentees were throughout their poster presentations and also while they were actively networking with students, my mentors, and other colleagues. This experience cemented my true passion for teaching, recruiting, training, and mentoring students to be leaders in toxicology and neuroscience.

**Q: Would you be willing to share some thoughts regarding how to increase diversity and inclusivity in academic toxicology?**

GK: Valuing and promoting diversity and inclusion in toxicology enriches learning and broadens everyone's perspectives. Leaders and educators will need to develop effective ways of rebranding toxicology to students at an early stage in their academic career. Individuals from underrepresented backgrounds are interested in addressing issues that affect everybody, but

especially their communities. Thus, educators will need to seriously consider highlighting how the field of toxicology aims to address equally relevant issues that affect underrepresented minority communities. The relevance, excitement, and career opportunities in the field of toxicology will need to be communicated to all students, postdocs, and educators. I am pleased that the current SOT strategic plan has a diversity statement as part of its [Mission and Principles](#) and restates it in the [Guiding Values](#) for the strategic plan. I would like to suggest that SOT further develop effective ways to strengthen activities that are directed at promoting diversity, equity, and inclusion in the field of toxicology. For example, educators need to be encouraged to develop other effective modes of teaching toxicology that are inclusive. It would be important for educators to make a convincing case for why toxicology should be incorporated in the curriculum at their various institutions. Finally, a big impact approach of enhancing diversity, equity, and inclusion in the field of academic toxicology is to introduce a cohort mentoring and training program for undergraduates, graduate students, postdocs, and early career scientists. This will help increase retention and promote success of all individuals, but especially those from underrepresented groups. The aforementioned will create a sense of community and promote diversity, equity, inclusion, and excellence in the field of toxicology.



**Ideas for the SOT Undergraduate e-Newsletter? Contact**

[Mindy Reynolds](#), FUTURE Chair  
Michael Borland, Newsletter Lead  
Blase Billack

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and Education (FUTURE) Committee**

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