Chairperson’s Greeting and Update

Dear Colleagues:

What a year and a half it has been, and I am still in awe of medicine and science and its accomplishments related to COVID-19 since early 2020. As educators we also have a lot to be proud of transitioning our pedagogy and delivery of course and lab work to the virtual format in March of 2020 and transformation of our classrooms into safe and productive virtual, hybrid, and in-person learning spaces for all our students in the 2020/2021 academic year. SOT also pivoted in 2021, delivering an excellent virtual meeting in which many of you participated.

This past summer 27 students engaged in research at 12 institutions around the country through FUTURE-supported internships. Members of the FUTURE Committee met virtually with those students at the end of their experience and were debriefed about their work. We hope that many of these interns, as well as other undergraduate researchers, apply for our the SOT Travel Award (due October 15) to support their travel and attendance at the 2022 SOT San Diego meeting to be held from March 27-31, 2022.

For educators, FUTURE continues to offer grant opportunities to support professional development and undergraduate research projects. We are also supporting the ToxScholar grant program for in country (virtual or in-person) visits or travel to developing countries. Continuing from years past, we will offer grants to Regional Chapters to expand involvement of undergraduates in their annual meetings.

New this year, FUTURE has assisted with a periodic, free webinar series that will provide resources and discussion to help faculty integrate core principles of toxicology into various courses. The series is seven monthly 60-minute webinars during the 2021-22 academic year. Developed for the North Carolina Higher Education Faculty and Mentor Network, participation in the webinars and community of practice will benefit those teaching undergraduates in a variety of classes in all states. Anyone teaching undergraduates or interested in undergraduate education is invited to participate, so share this invitation with your colleagues.

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

Larissa Williams, Chair FUTURE Committee
Associate Professor and Chair of Biology at Bates College (Maine)
Calling all Toxicology Educators!
Come in, please!
Share an abstract, please!

Share Your Teaching Innovations at SOT!

Please submit an education, ethical, legal, and social issues (EELSI) poster for the 2022 SOT Annual Meeting by October 15, 2021.

Toxicology education occurs at all levels, from science outreach to undergraduate, graduate, and professional training. We want to learn what you are doing and how successful your ideas have been. The EELSI poster session is an excellent opportunity to network with other toxicology educators.

Past Topic Examples
- Toxicology learning objectives for undergraduate courses
- Science outreach, school partnerships, and risk communication
- Low-cost toxicology lab activities
- Summer research experiences for high school and undergraduates
- Translating toxicology to the public
- Regional Chapter activities

From SOT Abstract Directions
In the case of studies that do not describe laboratory or field experiments, such as reports on educational, ethics, legal, or social initiatives, authors should:
- Describe the research or assessment approach instead of experimental procedures.
- Summarize the study’s results or findings explicitly.
- Clearly articulate the implications for stakeholders.

In addition, abstracts describing new initiatives or science policy in the regulatory community must clearly describe the impact on the practice of toxicology and/or risk assessment. Care should be
taken to clearly distinguish between statements based on documented facts versus opinions. Literature surveys or reviews and background materials are insufficient in and of themselves.

**Content Guidelines for Writing an Effective Education Abstract**

- What is the activity and its connection to toxicology?
- How does the activity inform, or how is the activity informed by, literature or national calls to action (e.g., PCAST reports, NRC, AAAS, HHMI, NSF, SO, Next Generation Science Standards, etc.)?
- Who is in the population being served?
- What are the learning outcomes/objectives for the activity?
- What are the details of the activity that can inform other practitioners?
- How has the effectiveness of the activity been evaluated?

**Help with Your Submission**

The SOT Faculty United for Toxicology Undergraduate Recruitment and Education (FUTURE) Committee and the Education and Career Development Committee (ECDC) encourage your participation in the education, ethical, legal, and social issues poster session. If you are already the presenting author on a research poster, consider including a graduate student or colleague in the development and presentation of the EELSI poster.

**EELSI Abstract Consultation:** FUTURE—Jamie DeWitt, ECDC—Pamela Lein

Visit the [Annual Meeting page](#) for more information or to [submit](#) your abstract.

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**SOT Annual Meeting Information**

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**Upcoming Deadlines**

- **October 9:** SOT Education and Undergraduate Educator Award Nominations
- **October 15:** Undergraduate Award Applications
- **October 15:** Abstract Submission
  - Share with students: [SOT Undergraduate Programs](#)

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When you have a student who is interested in toxicology research, apply for support!

SOT supports undergraduate research via two mechanisms: 

SOT Undergraduate Internships and 
SOT Undergraduate Research Awards

Yes, it’s true. Your Institution can get $$ to support student research. What a deal!

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, the Faculty United for Toxicology Undergraduate Recruitment and Education (FUTURE) Committee 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 are due January 7. For more information see Internship Program Support.

Yes, it’s true. Your student can get $$ to attend the SOT Annual Meeting and/or to support their summer research. What a deal!
Undergraduate Awards

SOT has a variety of awards to support undergraduate students attending the Annual Meeting and for other activities. The deadline is October 15 for the SOT undergraduate awards. See Awards for Undergraduate Students on the SOT website for a complete listing including component group awards. A student may apply for any award for which they are eligible, but will only receive one of the national awards that provides travel support for the Annual Meeting.

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

Undergraduate Diversity Program Student Travel Award

Students are selected to attend the three-day Undergraduate Diversity Program and receive meeting registration, 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 underrepresented in the sciences (e.g., Black/African American, Latinx, Native American, Pacific Islander), first generation college, from an institution that does not have biomedical graduate degrees, or a member of an underserved population.

Faculty who are not members of SOT can apply for the Undergraduate Diversity Program Advisor Travel Award. Those receiving the award receive meeting registration, travel funding, and lodging and attend the Undergraduate Diversity program.

- Student Information and Application
- Faculty Information and Application

SOT Undergraduate Research Award

Undergraduate students who submit abstracts can apply for this award. Abstracts are due October 15. Awardees receive meeting registration, travel funding, lodging, and special recognition.

- Information and Application

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 underrepresented in the sciences can apply for this travel award.

- Information and Application

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. Application deadline will be in 2022.

- Information and Application Materials
RC4 Undergraduate Travel Award

Three awards available. The Regional Chapter Communication and Collaboration Group (RC4) offers the RC4 Undergraduate Travel Award. The award provides travel funds for an undergraduate student to attend the SOT Annual Meeting and present a poster on a toxicology-related project. The applicant is a member of the Regional Chapter (RC), conducted research in the laboratory of a mentor who is a RC member, and submits the application to that RC. The Regional Chapter sets the deadline for receipt of applications but submits one nominee to the RC4 by October 15. The RC4 selects the three to receive the $1,100 award. More information and the application materials are found on the RC4 Award page.

Click on “Meetings and Events” on the SOT website navigation bar. There is a filter there to pull our RC events!

Reflection on the Project Kaleidoscope (PKAL)

STEM Leadership Institute

By: Larissa Williams, Bates College

This past July I was lucky enough to attend the Project Kaleidoscope (PKAL) STEM Leadership Institute in cohort B. Run by the Association of American College and Universities, the PKAL Institute is “uniquely designed for early- and mid-career STEM faculty, principal investigators, and administrators who are engaged in leading initiatives and interventions aimed at transforming undergraduate STEM education in their classrooms, departments, and institutions.” Participants are selected for the Institute through an application process. Normally the Institute is held in person in Maryland; because of COVID the four-day Institute was run online this year through a combination of Zoom and Remo platforms. Participants in cohort B, who were chairs, deans, and provosts, represented twenty colleges and universities throughout the US. The larger group was also broken down into five smaller mentor groups, each with four participants and a trained senior mentor. Day one of the Institute explored leadership style and practice through a combination of talks and active work including individual DiSC profiles and leadership profiles. Day two explored leadership challenges at the national and local level. The third day focused on equity, inclusion, and diversity. Overall, the institute provided me with time to understand and reflect on my own strengths as a leader and develop a set of goals and actionable plans for the future. It was wonderful to meet so many STEM leaders from around the country and I encourage other STEM leaders to attend the Institute in the future.
Grants for Faculty Who Teach Undergraduates

Two grants are available from SOT: (1) SOT Undergraduate Faculty Research Grant and (2) 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. SOT provides this funding to support faculty at primarily undergraduate institutions, which are often under-resourced for research, to encourage their professional development and engagement in toxicology as well as acknowledge and aid their potential for recruiting students into toxicology. Applications are due March 26, 2022, for projects in summer 2022 or in the 2022-2023 academic year. Let’s all work to help keep SOT’s future bright!

FUTURE has announced the three recipients of 2020-2021 SOT Undergraduate Faculty Research Grants. Eva-Marie Collins, an early career faculty member at Swarthmore College, is using the funds to support two students pursuing an academic year project studying how melatonin levels affect neural function and xenobiotic-induced neurotoxicity in the planarian *D. japonica*. Mindy Reynolds, Washington College, and the student working with her, collected additional data during the summer to support a grant proposal to further explore the impact of co-exposure to Co and Ni on DNA repair and induction of toxicity. Courtney Roper, an early career faculty member at the University of Mississippi, is working with two undergraduates who are collecting data for their Honor’s thesis project. Beginning this summer and continuing through the academic year, ambient filter samples of fine particulate matter will be extracted and prepared for chemical and toxicological assessments, including zebrafish development exposures.

_Congratulations to all the awardees!

Upcoming SOT 2022 Meeting:

Activities For Students

SOT will host undergraduate students in these activities at the 2022 meeting:

**Undergraduate Education Program** Sunday, March 27—Undergraduate students learn more about the variety of science related to toxicology through presentations and a case study, with the opportunity to network with graduate students and toxicologists. Breakout sessions feature tips on applying to and succeeding in graduate school and career opportunities in different employment sectors. The afternoon concludes with open time to meet with representatives of various graduate programs in toxicology.

**Student/Postdoctoral Scholar Mixer** Sunday, March 27—This event, which follows the SOT Welcome Reception, is the opportunity for undergraduates to network with other undergraduates, graduate students, and postdoctoral scholars as well as learn more about involvement in SOT component groups.
In Vitro Lecture and Luncheon Monday, March 28—During lunch, the speaker will present a case study topic which will then be discussed at each table. Guests at this event include undergraduates, graduate students, and postdoctoral scholars, and the toxicologists who serve as hosts and discussion facilitators.

Undergraduate Student Meeting Tuesday, March 29—All undergraduate students are invited to this informal gathering to learn more about engaging with SOT and to network with graduate students. Learn about their experiences as trainees and what different graduate programs are like.

What’s Your Position on Positionality Statements in Course Outlines?

Some faculty members around the country have begun to include positionality statements in their course outlines as a means of providing a point of reference to students in their classes. A recent article in the International Journal of Education (2020: Volume 8, Issue 4) by Dr. Andrew Gary Darwin Holmes (School of Education, University of Hull, Hull, England) explains the nature of positionality and its importance in enhancing the research learning experience. Here is an example of a positionality statement:

Example #1**:

Positionality statement:
Before I present the findings, and in the spirit of self-reflexivity, I acknowledge my standpoint as an educated Black American woman. I am not an avid participant in Black online spaces such as comments sections, but I have observed the interactions of other users, advocated for Black online spaces, and am intrigued by the use of language to mark and protect cultural identities. I acknowledge that my positionality influenced this project to some extent; my member resources proved to be important tools that helped me make meaning of the text.

Documented in the above positionality statement:
● Education
● Personal experiences related to the topic
● Race / ethnicity
● Sex
**Example #2:**

Positionality statement:
As Scharp and Thomas (2019) argue, scholars engaged in critical social science research should assess how their own positions and experiences might contribute to their interpretations of people's lived experiences. With this in mind, none of the authors have experienced parental alienation from the perspective of either parent or child. Instead, the first author has been studying family distancing for over a decade and has consequently garnered the stories from parents, children, and immediate family members of distanced parents and children. The first author contends that being immersed in the context of family distancing allowed her to relate to the participants and develop trust even though she was not alienated herself. Furthermore, not identifying as an alienated parent allowed the research team to protect themselves from reliving the emotional trauma expressed by many of the parents in their narratives.

*Documented in this positionality statement:*
- Educational background
- Personal experiences related to the topic

Obviously, the examples above are from the area of relationship sciences and sociology. Moreover, it should be acknowledged that the article cited above, and its related examples, are coming from the viewpoint of social and relationship sciences. Nevertheless, one could argue that developing a positionality statement as identified in the article above also translates into better identifying with and connecting with students in the classroom and research/mentoring environments, including forcing us to think about our biases and potential assumptions that we take into those environments. Developing a positionality statement is important and appropriate in toxicology, too, as toxicology research has both indirect and direct impacts on health disparities and at-risk populations and in science communication.

Below is a positionality statement written by 2018-2021 Council member Courtney Sulentic for SOT Mentor Match. While she has not yet written a statement for her classes, she is strongly considering it.

**Example 3:**
Positionality Statement, Dr. Courtney Sulentic, Wright State University

"I am a white, heterosexual, cisgender female and a first-generation college graduate who grew up in a farming community in Michigan. I earned my BS in Biology at Lake Superior State University and my PhD in Pharmacology and Toxicology at Michigan State University under the mentorship of Dr. Norbert Kaminski. Because of a dual career family, I stayed in the Kaminski lab for my postdoc..."
during which time I had two children. After my postdoc I moved with my family to the Dayton-Cincinnati area in Ohio and started a non-tenure faculty position at Wright State University while my husband joined a medical practice. I am currently an Associate Professor in the Department of Pharmacology & Toxicology within the Boonshoft School of Medicine at Wright State University. I am actively involved in SOT and Ohio Valley SOT Regional Chapter."

Documented in the above positionality statement:

- Sex
- Race / ethnicity / family background
- Education
- Career path

Let us sincerely thank Dr. Sulentic for sharing her statement and reflect upon it as we head into our classrooms this fall.

In closing, have you considered including a positionality statement in your course outline? What do you think about this practice? Maybe now is a good time to develop a positionality statement for your students. Keep an eye out for this developing concept and we invite you to share your experiences on the use of positionality statements in your course outlines with the FUTURE committee. How about starting a discussion thread in the UEN ToXchange community?

Obtained from the website of the International Association for Relationship Research (iarr.org). This resource is outside of SOT and is provided for informational use only. Inclusion does not constitute an endorsement by SOT.

Toxicology Educator? Here Are Some Resources that SOT Has 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 freely available. Take a look to see what you can incorporate into your teaching! If you know of a link or resource not listed here that would be of general interest to the Undergraduate Educator Network, please email your link to Betty Eidemiller.
Undergraduate Toxicology Teaching Resource Repositories:

LifeSciTRC and CourseSource

Wade Powell, Kenyon College

Whether creating a brand-new course or adding new materials to an existing course, finding curated learning materials for toxicology can be difficult. The Society of Toxicology via FUTURE has endeavored to address this by partnering with two national, multi-disciplinary repositories for teaching materials aligned with Vision and Change.

The Life Sciences Teaching Resource Collection serves as a repository for basic teaching resources, such as syllabi, schedules, presentation slides, lectures, lab course activities, and more. Submitting resources is easy, and the materials you share are published quickly online. LifeSciTRC will ultimately replace the SOT’s web site as a repository for sharing undergraduate toxicology teaching materials, making them available to the platform’s users from all the other participating societies, which include the Genetics Society of America, the American Physiological Society, and the Society for Developmental Biology.

CourseSource is an online, peer-reviewed journal publishing evidence-based life sciences teaching resources that are aligned with learning goals established by professional societies. Published manuscripts are present the resource in a fashion that can be readily adopted at other institutions, providing explicit links with evidence-based learning frameworks. SOT’s recent adoption of the Toxicology Learning Framework in (Gray et al. 2019; see Toxicol Sci 170:20-24) now gives undergraduate educators in our discipline the opportunity to publish resources on CourseSource, transcending generosity and rising to the level of real scholarship. Other participant societies include the American Society of Biochemistry and Molecular Biology, American Society of Cell Biology, and the American Society of Microbiology.

In partnering with LifeSciTRC and CourseSource, SOT seeks to encourage the utilization, creation, and submission of teaching materials to Society-endorsed online repositories, inspire the use of the Undergraduate Toxicology Learning Framework in toxicology courses throughout the US, and spread toxicology to other disciplines through collaboration and widespread exposure. We welcome, and indeed depend upon, the participation of all UEN members.

Don’t forget to attend the following education session at the 2022 SOT meeting:

Publishing Educational Toxicology Exercises in CourseSource: A Step-by-Step Workshop for Preparing Your Manuscript
SOT ToxScholar Program

The SOT ToxScholar program provides the opportunity for toxicologists to visit primarily-undergraduate campuses (in-person or virtually) to present toxicology content relevant to courses such as chemistry, biology, and environmental science. In addition, the speaker often meets informally with students to discuss career paths in the biomedical sciences. Funding of up to $500 is available for a speaker who arranges a visit to an institution in the country of residence. A toxicologist from a different country who conducts a visit to an institution in a developing nation may apply for up to $1,250 funding. For international visits, FUTURE Committee encourages the applicant to seek matching funding from partners, whether an SOT Special Interest Group, employer, or host institution. This year, there is no application deadline and applications will be reviewed as received. A letter from the contact at the institution to be visited is required as part of the application.

2021 SOT Interns (and Their Mentors) Tell Their Stories

SOT Interns at Northern Kentucky University

Mickayla Kowalski and Emily Wical

We were both really lucky to have been chosen for this lab experience with Dr. Curran and the other students. We have learned so much through our research and even outside of the lab as well. There have been so many different experiences that we have been a part of, all of which have improved or taught us new personal and practical skills. Throughout the summer we have had the opportunity to learn and then run different behavior tests using our mouse models. We have also been able to examine our data and communicate these results throughout our research group to gain a larger understanding of what they mean. We also had the unique opportunity to work on a separate project that used BTBR mice as an autistic mouse model. The variety of studies in our lab has been a great positive to our skill set that has been developed through our involvement in the lab. It has been so amazing to talk to all the different people in our lab to learn more about their goals and ideas in the lab and also in their individual lives. We have gained many new friends and resources to reach out to whenever we need help. This help even extends to outside the laboratory and with our future careers and endeavors. The best part of our experience in the lab was our science outreach opportunity. We have been able to extend our new toxicology knowledge to younger kids through fun and exciting activities. It has been a very memorable
experience this summer and we are excited to see how our future in the lab and in the world of toxicology will play out for us!

**SOT Mentor: Christine Perdan Curran**

I have been extremely fortunate to receive SOT internship funding for the last several years to double the number of students doing undergraduate research in my lab over the summer. Northern Kentucky University has an outstanding program called UR-STEM to involve students early in their academic careers in undergraduate research across the STEM disciplines, and SOT’s matching funds allow me to support two students instead of one. Although that sounds modest, the impact is high. Retention in my lab is more than double the national average and is directly attributable to providing engaging, hands-on experience in toxicology research.

This summer, I was privileged to mentor Emily Wical and Mickayla Kowalski who worked on a variety of projects related to benzo[a]pyrene toxicity, assisted at a neuroscience academy for high school students, and served as near peer mentors for our Esperanza Fun with Science camp for middle school students from our local LatinX community. Both Emily and Mickayla were incredible in the lab and soon became experts at neurobehavioral experiments. We had weekly lab meetings focused on toxicology basics including another new undergraduate and a high school student. I can’t say enough about the benefits of the ToxTutor web site. It is a fantastic tool that allows students to discover the value of toxicology research and consider potential careers in the field.

**SOT Intern at Rutgers University**

**Jarett Reyes George**

My name is Jarett Reyes George. I am a junior studying biochemistry at Rutgers University. I found out about this program through my Genetics TA after expressing interests in conducting research. We had a one-on-one meeting and he told me about different programs the school offered and encouraged me to apply. The project I worked on dealt with reproductive toxicology. I was fortunate enough to work in two labs with the goal being to determine if nano-titanium dioxide could translocate into the fetus after the mothers underwent inhalation exposure. In Dr. Stapleton’s lab (working with Dr. Stapleton, and PhD student Jeanine D’Errico) the tissues from the fetus were collected while in Dr. Buckley’s lab (where I worked alongside Dr. Doherty), I performed tissue digestion for Inductively Coupled Plasma Mass Spectrometry (ICP-MS), an analytical
chemistry technique. Working with animals and performing necropsy was never an issue to me since I’d had prior experience, until my sophomore year I had wanted to go to medical school and become a forensic pathologist. One internal struggle for me going into the program was overcoming imposter syndrome. There were times at the beginning where I just did not believe if I was capable of this because I lacked knowledge due to not taking some courses and never doing bench work before. However, everyone was very welcoming and understanding so, this feeling was quickly extinguished. I also had weekly meetings to discuss the readings about the project, which aided my understanding of what was going on.

Participating in this program showed me that I do in fact like research and am likely to go to grad school for a PhD. As ironic as it may sound, I’m glad there were some complications while the dealing with the tissue digestion process. It taught me that not everything works the first time, and how a lot of patience and troubleshooting goes into achieving results. I was always interested in toxicology, but never had any experience within the field. After completing this program, I can genuinely say that I see myself pursuing a path in toxicology. I had a great time being in the lab this summer. Due to the lab being small, I was able to get to know and become close to everyone quickly. I felt like a great fit which is a reason why I am staying for the 2021-2022 school year. Something I really appreciated about this experience was how I met a lot of graduate students and was able to hear about their journey that led them here. I found this to be valuable as I did not know what I wanted to do beforehand, but I was able to learn about everyone’s unique story. Overall, this summer program was amazing and provided me with an irreplicable experience.

SOT Mentor: Phoebe Stapleton

Jarett has been an absolute joy to have in the laboratory. He was the student we needed for the mid-COVID summer. Jarett is a first-generation college student with a pure, infectious enthusiasm for all things science. It quickly became the highlight of my week to discuss assigned background readings, his ongoing research project, and the extension of his work into other laboratory projects. I learned that Jarett has no poker face; he visibly vibrates in his seat as he works through the integration of concepts, interpretation of the data, and realization of the impact of his work. We’d discuss the areas of science, and nuances to each, that this project encompasses (i.e., reproductive physiology, inhalation toxicology, nanotechnology, and analytical chemistry) along with recognition of the tangible skills and techniques that he has acquired. We discuss how the skills he was learning this summer can be applied to a variety of scientific pursuits and future careers (i.e., experimental design, animal handling, surgical techniques, good laboratory practice, sample preparation, pipetting, laboratory notebook and spreadsheet management, and statistical
analyses). It was this raw enthusiasm for the question, the search for the answer, and providing Jarett with the skills to find the answers that made our summer so rewarding. As the PI and especially after the COVID year, it was so easy to get caught up in the day-to-day and month-to-month tasks of laboratory and project management; I’d forget the little wins. It’s the transition from experimental design to experiment, first time feeling when the experiment ACTUALLY works, how the data fit together, and sharing what all those numbers may mean with others that make our jobs rewarding. Jarett reminded me to slow down and celebrate the daily victories that get us closer to our scientific answers. We’ve invited Jarett to SOT in San Diego this upcoming March. He’ll be the student with the blindingly wide grin bouncing down the halls of the convention center. Be sure to stop and say hello, his enthusiasm is contagious.

**Other SOT Student Internship Stories**

SOT has assembled recordings of students telling the impact of their internship experiences. Give a listen!

- [Darren Boydston](#)
- [Krystal Santiago Colon](#)
- [Madeline Hlobik](#)

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**SOT and NCABR Network: Focus on Toxicology Curriculum**

Jamie DeWitt, East Carolina University

When did you first learn about toxicology and decide that it was the career path for you? If you learned about it while you were an undergraduate student, consider yourself among the few. Very few undergraduate programs offer bachelor’s degrees in toxicology or closely related fields and toxicological concepts are not often widely taught among basic sciences courses. This means that talented students who may have an interest in toxicology may not learn about toxicology before deciding on a career path. The North Carolina Higher Education Faculty and Mentor Network (“the Network”) is striving to change that paradigm by educating the educators to enhance toxicological knowledge among undergraduates.
The Network is a partnership among the SOT, the North Carolina Regional Chapter, and the North Carolina Association for Biomedical Research (NCABR). Based on SOT’s strategic plan to increase SOT’s influence through science communication, the partnership was formed to develop and implement a two-year outreach program to undergraduate science educators in North Carolina. The goal of the program is to increase awareness of toxicology as a career option among undergraduate educators and their students by encouraging increased undergraduate student involvement in SOT programs and use of SOT educational, mentoring, and curricular materials by undergraduate faculty and their students. The Network includes faculty from various universities across the state who are heavily engaged in undergraduate education and who interact with Network mentors from SOT, NC SOT, and the NCABR through meetings, Webinars, and other virtual sessions. The fall webinar series begins in September, with webinars on Core Concepts of Toxicology. Use this registration form to join. Next session is September 29. Other electronic resources developed by the Network are available at the NC Network page. If you are in North Carolina and would like to become a mentor or a participating faculty member, please contact NCABR.

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**FUTURE Committee Member Profile: Dr. Michael Borland**

This newsletter feature highlights a FUTURE member. SOT members may access the full list of FUTURE Committee members.

Michael Borland, PhD, is Associate Professor, Bloomsburg University of Pennsylvania, Bloomsburg, Pennsylvania.

**Q. Describe your journey in toxicology. When did you first become interested in the subject?**

Growing up in rural western Pennsylvania, I did not formally know what toxicology was or that I could have a career in higher education. I did have some limited exposure to toxicology principles (like doses, poisons, etc.) as an Eagle Scout and from my mortician/tombstone engraver father. My journey toward science and academia began with very supportive parents and some amazing high school teachers. With a primary interest in biology and chemistry, I went to Penn State University to study Biochemistry and Molecular Biology (BMB). I was naïve to the vast world of scientific knowledge I was about to dive into, and I’m thankful for my PSU STEM professors who were inspiring scientists and educators. It was through their efforts that my fire was sparked for understanding the intricacies of BMB, diseases, and life/death.

During my sophomore year, I then had a serendipitous encounter that put me on the path to toxicology. I met Dr. Jeffrey Peters (now EIC of *Toxicological Sciences*) playing basketball at the
Intramural Building (we later played on a team together). As we spoke over that season, his enthusiasm for toxicology and cancer research hooked me. I joined Dr. Peters’ lab to conduct my Honors Research Thesis on peroxisome proliferator-activated receptor (PPAR) target gene identification in keratinocytes, and I spent four semesters immersed in molecular toxicology. I decided to stay at Penn State for my doctoral work with Dr. Peters and focused my research on PPARβ/δ-dependent regulation of polycyclic aromatic hydrocarbon (PAH)-induced skin tumorigenesis. Through a National Science Foundation Graduate Research Fellowship and collaboration with Dr. Gary Perdew, I investigated the connectivity of the aryl hydrocarbon receptor (AhR) pathway and PPARβ/δ in mouse and human skin cancer models. I learned to tackle scientific inquiry creatively, methodically, and thoughtfully under the mentoring of these two brilliant and dedicated scientists. I attended many SOT meetings and became involved with Specialty Sections and Graduate Student leadership. Throughout this time, I felt a constant draw toward a career focused on undergraduate education and welcoming others to the field of toxicology. Following a short postdoc, I transitioned to a tenure-track position at Bloomsburg University (a primarily undergraduate institution in the Pennsylvania State System). Fast forward eleven years, I am still at Bloomsburg University, and continue my focus on teaching biochemistry/toxicology to nurses and STEM majors while engaging numerous undergraduates in PPAR toxicology and skin cancer research.

Q. How has being a member of the FUTURE Committee of SOT helped you from a faculty development perspective?

I am very grateful for the opportunity to serve on SOT FUTURE. This appointment has helped me develop the tools to effectively advocate for students and the field of toxicology. I have utilized many of these lessons while leading initiatives in my own department (Chemistry and Biochemistry) related to retention, educational access, and an impending university merger. Above all, I’ve been inspired by the passion and creativity of our FUTURE members to promote toxicology’s inclusion in common undergraduate curriculum. Furthermore, I now have a much larger and more diverse network of toxicology colleagues that I can lean on in the future. Finally, FUTURE has helped me re-assess my notions of professional development, which will help me create a greater toxicology imprint to my institution and state.

Q. In three to four sentences, which is not easy to do, describe your research to our readership.

My lab focuses on the role of peroxisome proliferator-activated receptors (PPARs), a class of nuclear hormone receptors, in skin homeostasis and cancer. Students in my lab utilize human cell lines, models of modulated receptor expression, and natural/synthetic ligands to investigate cellular signaling pathways related to cell proliferation and tumorigenesis. We also investigate how common cancer therapeutics can be combined with PPAR-based approaches in the development of personalized medicine strategies.
Q. What advice can you give to members of the UEN who are new to toxicology or who are looking to incorporate toxicology into the courses they teach?

My best advice is to get involved and ask questions. I know that many institutions have few toxicology educators, and this can often feel isolating to new educators or those looking to incorporate new ideas (toxicology) into a curriculum. The UEN is just the place for you! Our UEN possesses unmatched toxicology educational memory and an equivalent commitment to helping others integrate toxicology into undergraduate curricula. There are no “bad” questions, and you’ll find nothing but support from UEN members. Get involved!! Whether you learn from a colleague or inspire another, we all benefit as the UEN expands and connects more of us.

Q. Aside from toxicology, what hobbies or other interests do you pursue?

Currently, my hobbies revolve around my kids (age 6 and 9). I coach baseball and soccer year-round. That consumes a lot of my free time, but I wouldn’t have it any other way right now. Teaching sports, much like teaching science, takes engagement, patience, and planning. Coaching with my children and their friends builds community and inspires the next generation to examine all they do with thoughtful and inquisitive eyes. In the “professional” hobby realm, I now lead the cDNA Resource Center as Co-Director. This non-profit was donated to my institution by a former dean, and I continue its 17-year mission to generate revenue toward the support of vast student and faculty initiatives within my college and university. As an Education Fellow of American Society for Biochemistry and Molecular Biology (ASBMB), I also spend free time involved with its initiatives related to the national accreditation exam. Overall, I view my hobbies as service- and outward-focused, in homage to the many others who have inspired, supported, and invested their energy in me.

Q. How can toxicology help to make a more equitable and inclusive world?

I think the profession of toxicology has been a great example for equity and inclusivity. Our society brings a vast arena of disciplines (STEM, legal, policy, etc.) under a single umbrella, which provides great leverage for our society in cultivating inquiry and discussion amongst its diverse membership. Our society’s inclusivity initiatives, international recruitment, and vision to the future have also created many opportunities to engage historically underrepresented populations, varying academic disciplines, different toxicology venues (academia, industry, government), and vast regions of the world. I am proud of these initiatives, and any small part I may have played as part of SOT FUTURE. Finally, the best example of our inclusivity is to attend a national meeting. I am constantly in awe to see such a collection of diverse, supportive, devoted, and brilliant attendees. I always leave the meetings inspired, and I look forward to SOT 2022!
Q. This is your final year on the FUTURE committee. What will you miss most about serving SOT in this way?

As I cycle off SOT FUTURE, I will miss the work advocating for undergraduates in toxicology. I’m sure I’ll find another SOT opportunity in due time, but FUTURE will always hold a special place in my heart. I have worked with many amazing toxicology and education advocates, and each has left an imprint on my future trajectory. I will especially miss the conversations, banter, enthusiasm, and monthly meetings when I did my part to plug into our national toxicology network. FUTURE felt like a family where our collective strengths created impactful change within the society for undergraduate educators and students, and I am honored to be part of FUTURE’s early years of existence. I look forward to FUTURE’s future...ha-ha.