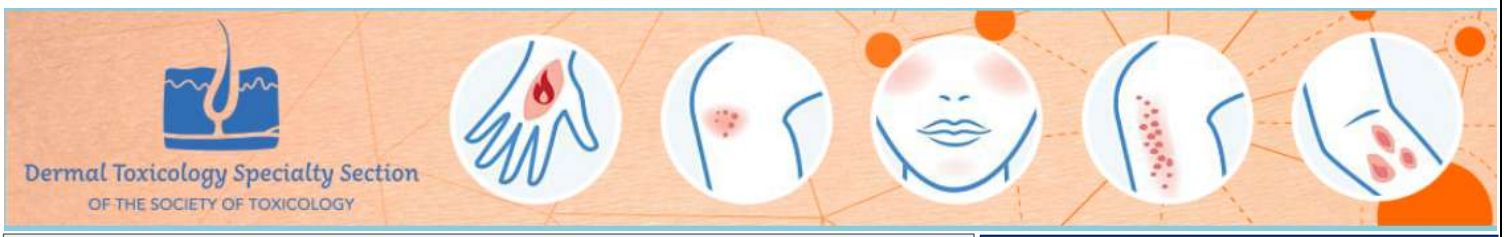


President's Message

Dear DTSS Colleagues,

This is my first message to you as President, and I couldn't be more honored to serve such an incredible community. Working alongside our Executive Board has been a true pleasure. Together, we've strengthened the DTSS foundation and focused on what matters most: delivering meaningful, high-quality content for our members. That said, there is more work to do. We've heard your feedback: you want to see DTSS explore emerging fields such as NAMs, Omics, and Quantitative Risk Assessment as key areas for growth—we are committed to the task.

Over the past year, we've made great strides in expanding our technical programming and improving communication across DTSS. You may have noticed—we've moved to a **biannual newsletter** and **increased the number of webinars** hosted in 2025. We partnered with the Sustainable Chemicals through Contemporary Toxicology Specialty Section (SCCT) for the joint webinar, "*Recycled, But Safe? Tackling Contaminants in Sustainable Packaging for Cosmetics & Personal Care*." With 140 participants, it's clear that sustainability and safety are hot topics in our field. In October, 164 registrants helped us celebrate our 2024 DTSS Paper of the Year Award winners in a webinar featuring Dr. Nancy B. Hopf (U. of Lausanne, CH) and Hans Raabe (Institute for In Vitro Sciences). These successes highlight DTSS's commitment to advancing dermal toxicology and fostering a collaborative, dynamic environment for our members.

We're also excited to announce a **new travel award** inspired by the 60th anniversary of the Research Institute for Fragrance Materials (RIFM). To commemorate this milestone, RIFM will sponsor a $500 DTSS Trainee Travel Award for a student/trainee conducting research in NAMs, exposure science, material composition, or risk assessment. Speaking of awards, a quick reminder that **DTSS award submissions are due January 8th**! Encourage your students or postdocs to apply. If you'd like to help us judge award applications, or if you're interested in sponsoring a student award or contributing to the DTSS annual reception please reach out to me of any member of the DTSS Executive Committee—your support truly goes a long way in keeping our community strong and active!

As we wrap up 2025, this newsletter is packed with member-driven content: results from our membership engagement survey, insights on NAMs, tips for surviving PhD qualifiers, and highlights from our Fall Webinar. You'll also find award recognitions, member achievements, and details about the 2026 SOT Annual Meeting (don't miss the DTSS reception information listed on the last page!). We also are **calling for DTSS officer nominations** so consider throwing your name in the hat!

As always, **we welcome your ideas** for future programming, webinars, and leadership nominations. Your engagement and creativity keep this community thriving. Finally, a heartfelt thank you to our DTSS leadership team, sponsors, and all of you—our passionate, curious, and committed members—for everything you do to advance dermal toxicology.

Stay connected through the DTSS website and our LinkedIn posts, and don't hesitate to reach out.

A.J. Cuevas, PhD, DABT, ATS, MPH
DTSS President

In This Issue

APPLY FOR A DTSS AWARD!

It's award season! If you're a professional, graduate student, or postdoctoral member of DTSS, we encourage you to apply for a DTSS Award. The deadline is January 8, 2026.

In addition to receiving a monetary award and recognition at the DTSS Annual Reception, being selected as a winner is an excellent addition to your CV!

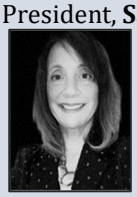
Scan the QR code or visit the DTSS Awards Page to learn more about the available awards.

Contact **Ying Huang** (yhuang@westernu.edu) with questions.

2025-2026 DTSS Executive Committee Officers

We want to increase membership connection—we welcome your feedback, comments, and creative suggestions to help shape our future, so don't hold back! Eager to make an impact? Run for office next year. We're looking for nominees for **Vice President-Elect**, **Junior Councilor**, **Postdoctoral Representative**, and **Graduate Student Representative**. To nominate yourself or someone else, reach out to **AJ Cuevas** (ajcuevas@combe.com).

Not ready for an Officer role? No problem—there are still plenty of ways to participate! Share ideas for webinars, contribute content for our newsletter, and judge annual awards. To learn more about volunteer opportunities, connect with DTSS Past President, **Sarah Gilpin** (sgilpin2@mmm.com).


Sarah Gilpin
Past President & Councilor


AJ Cuevas
President


Jamie Coleman
Vice President


Clive Roper
Vice President-Elect


Mayukh Banerjee
Secretary/ Treasurer


Ying Huang
Sr. Councilor


Sid Ejaz
Jr. Councilor

This could be you!
Vacant
Postdoctoral Representative


Andrew Roney
Graduate Student Representative

The Strength of DTSS lies in *YOU—Our Members*!

A Quick Look at the Membership Survey Results

By: Mayukh Banerjee

Your ideas, energy, and expertise drive everything we do. You shape our priorities, inspire new initiatives, and define the vision that keeps our Specialty Section advancing the field. The DTSS Executive Committee (EC) deeply values your voice and relies on your feedback to guide how our community grows and thrives.

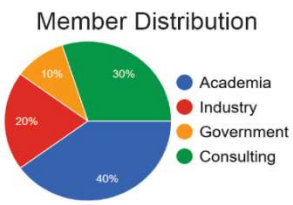
Earlier this year, we surveyed our membership with one goal in mind: to learn more about the type of programming, activities, and engagement opportunities **you** want from DTSS. This is an ongoing effort to ensure we continue meeting your needs and delivering value to every member.

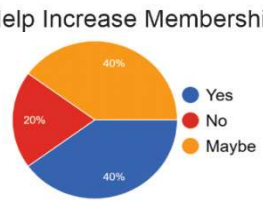
Key Takeaways: We're excited to share a few early insights from the responses we've received so far:

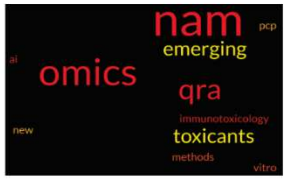
1. **Strength in Diversity:** DTSS brings together experts across disciplines, fostering collaboration, creativity, and shared decision-making.
2. **Strong Foundation, Room to Grow:** Members value DTSS's engagement, communication, and scientific content, but see opportunities to expand our presence—especially on LinkedIn.
3. **Growing Together:** There's strong enthusiasm for broadening DTSS membership and sponsorship to further strengthen our community.
4. **Looking Ahead:** Members are eager to explore emerging fields—including NAMs, Omics, and Quantitative Risk Assessment—as exciting future growth areas.

Get Involved: Power DTSS Forward, your input truly shapes our direction. Help keep DTSS strong and connected!

1. **Share Your Voice:** Haven't taken the survey yet? Take a minute to complete it—your feedback directly influences DTSS priorities. *Scan the QR code below to get started!*
2. **Get Involved:** Volunteer your time and talents! Help judge awards, contribute to the newsletter, manage social media, host webinars, mentor junior members, or assist with sponsorships.
3. **Connect with Us:** **Reach out to any EC member** to explore how you can make an impact. Every idea, every effort, and every voice counts!







At the Intersection of Chemistry and Toxicology: Thoughts from a Chemist–Toxicologist

By: Scott F. Sadoff, MS; CEO, PCR&S^2 Edited: AJ Cuevas

Toxicology is a nexus of multiple scientific disciplines, including Chemistry, Biology, Biochemistry, Physiology, and Pharmacology. Each contributes essential insights into how substances interact with living systems. As a trained Chemist with experience in the personal care industry, I wish to describe just a few connections between Chemistry and Toxicology that underscore this interdisciplinary relationship.

The calibration curve from Analytical Chemistry finds its counterpart in the Dose Response Curve, one of the core tenets of modern Toxicology. In each case, a mathematical relationship derived from a "training set" enables us to interpolate or predict an unknown "y value"—whether that be an analyte concentration or physiological response such as an ET50 value in an *in vitro* toxicology assay.

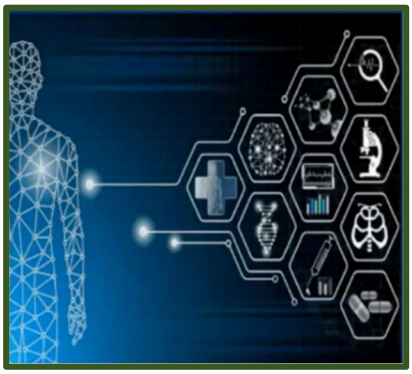
Similarly, reaction mechanisms from Organic Chemistry (does anyone remember SN1 versus SN2?) are analogous to the Adverse Outcome Pathway (AOP) concept in Mechanistic Toxicology. Indeed, the first step in an AOP typically is a "molecular initiating event", in other words, a chemical reaction.

Finally, fundamental chemical concepts can be used to predict the directionality of toxicological parameters. For example, to a first approximation, dermal absorption increases with decreasing molecular size (tracked by MW) along with increasing hydrophobicity (tracked by KOW), which itself follows from the degree of molecular polarity, or separation of charge.

Although Chemistry and Toxicology are discrete fields, the "membrane" between them is both permeable and dynamic. Advances in computational modeling, *in vitro* systems, and New Approach Methodologies (NAMs) continue to blur traditional boundaries, reinforcing the idea that a strong grounding in Chemistry enhances our ability to predict, interpret, and mitigate toxicological risk. At their intersection lies the essence of modern safety science—where molecular understanding meets biological insight to protect human health and the environment. Thus, the future of successful science lies in our ability to recognize and harness the intersections between disciplines such as Chemistry and Toxicology.

Advancing New Approach Methodologies: The Next Frontier in Regulatory Science

By Clive Roper



New Approach Methodologies (NAMs) are rapidly changing how we evaluate chemical and product safety—especially in dermal toxicology. These approaches aim to replace or reduce the use of live animals by applying innovative *in vitro* and computational technologies that answer the same regulatory questions more efficiently and human-relevantly.

NAMs cover a wide spectrum of tools, from established regulatory tests like the 3T3-NRU phototoxicity and skin absorption assays to novel 3D and computational platforms. The term "new" reflects new ways to approach traditional toxicological questions, not necessarily brand-new technology. Examples range from reconstructed human epidermis (RHE) models, such as **SkinEthic RHE**, to more complex 3D co-culture systems like the **Phenion® FT Skin Model**, and cutting-edge **organ-on-a-chip (OoC)** or **microphysiological systems (MPS)**. Computational tools, such as **LHASA's Derek Nexus**, further complement these methods by predicting toxicological outcomes *in silico.*

For NAMs to be meaningful in a regulatory context, they must have a clearly defined **context of use (CoU)**—that is, the specific question the method is designed to answer. CoUs are often developed using **adverse outcome pathways (AOPs)**, which map the chain of biological events from a molecular initiating event to an observable effect. In the case of **skin sensitization**, for example, three key events (KEs) are measured through a **defined approach (DA)** that combines *in vitro, in chemico*, and computational tests to predict overall hazard.

Complex *in vitro* models (CIVMs)—including organoids, spheroids, tumoroids, and transwell systems—are particularly promising for dermal research. These models use human-derived cells and micro-engineered environments to replicate skin architecture and physiology, allowing researchers to study barrier function, irritation, inflammation, and metabolism in unprecedented detail. OoC systems add another dimension, enabling real-time visualization of live-cell responses, metabolite production, and biomarker expression.

Regulatory acceptance of NAMs continues to grow. The **FDA and NIH** recently announced a **roadmap** to phase out animal testing requirements for monoclonal antibody safety assessments, marking an important shift toward alternative approaches. Updates shared at **WC13** and **SACATM** meetings in 2025 by FDA highlighted an increasing requirement for NAMs to be included in regulatory submissions, underscoring the need for robust evidence of biological relevance and reliability.

The continued evolution of dermal toxicology depends on the integration of systems biology, bioengineering, and computational modeling. By establishing mechanistic linkages between AOPs and human biology, NAMs facilitate predictive toxicology frameworks that improve translational confidence. The field is advancing toward a scientifically rigorous, data-rich paradigm—one in which mechanistic understanding drives decision-making and accelerates innovation in chemical safety science.

Reference: LaFollette et al. (2025). *ATLA* 53(1): 26–41. doi: 10.1177/02611929241310566.

Surviving your PhD Qualifying Exams

By: Alma Avila Oropeza, MS, Toxicology PhD Candidate
School of Medicine & Dentistry University of Rochester

Qualifying exams are a major milestone in completing your PhD training, one that can feel both intimidating and stressful. The process involves many moving parts, from selecting your committee members to receiving ongoing feedback from your PI. While every journey is unique, I would like to share a few strategies that made my own experience smoother and more manageable.

First, start writing your qualifying exam document as early as possible. Giving yourself ample time not only reduces last-minute pressure but also allows for multiple rounds of feedback. Seek input from your mentor, lab members, and equally importantly your committee members. Remember, your committee is there to serve as mentors, and most will gladly provide suggestions to help strengthen your work.

Another tip that greatly benefited me was seeking feedback from individuals outside my specific research field. An "outsider's" perspective can help you identify gaps, clarify your narrative, and reshape your story in ways you might not have considered. For me, the writing process was especially challenging because English is my second language. I knew I would need to go through numerous edits, but each revision helped me communicate my ideas more clearly and with greater confidence.

During my preparation, I also set aside dedicated time to study potential topics for the Q&A portion. To fully focus, I paused any pending experiments and shifted my attention to studying and practicing. As the exam date approached, I rehearsed my presentation multiple times, first with members of my lab, then with colleagues in my PhD program. In my experience, you can never have too much feedback or practice.

"Trust the work you've put in, lean on your mentor's guidance, walk into the exam with confidence!"

One of the most important lessons I learned was that your committee members and mentors are there to support you. Their goal is not to fail you, but to help you grow into a stronger scientist and a more critical thinker. It's normal to reach a point where you feel unprepared, even after months of preparation. **In those moments, trust the work you've put in, lean on your mentor's guidance, and walk into the exam with confidence**!

DTSS Recent Fall Webinar Well Attended!

Exploring the Future of Skin Toxicology and Risk Assessment

Recognizing the 2024 DTSS Paper of the Year Award Winners

By: Sid Ejaz

DTSS's 2nd webinar of 2025 drew a crowd—164 registered and 82 tuned in live to hear from the two DTSS Paper of the Year Awardees whose work is redefining the science in dermal toxicology! **Dr. Nancy Hopf** and **Hans Raabe** delivered compelling talks highlighting the move from traditional animal models to advanced, human-relevant approaches that are reshaping dermal toxicology and risk assessment. See the recap summaries below.

Assessment of Skin Permeation of Phthalate Plasticizers *In Vivo* and *In Vitro*

Presented by: Dr. Nancy Hopf

Dr. Nancy Hopf (Unisanté, University of Lausanne, Switzerland) presented compelling new data on how common phthalate plasticizers interact with human skin, offering a deeper understanding of dermal exposure pathways. Her research focused on three phthalates—diethyl hexyl phthalate (DEHP), dibutyl phthalate (DBP), and diethyl phthalate (DEP)—and combined both *in vitro* and *in vivo* human studies to clarify how these chemicals are absorbed, metabolized, and eliminated.

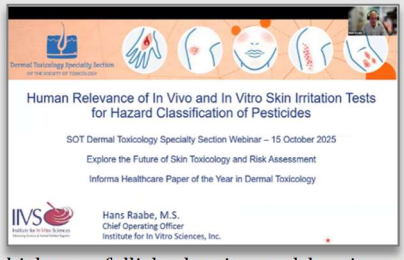
Using deuterium-labeled compounds (d_4-DEHP, d_4-DBP, d_4-DEP), Dr. Hopf's team was able to distinguish test-related exposure from the ever-present background contamination found in most humans, yielding an unusually precise characterization of skin permeability. The findings revealed distinct absorption profiles: DEP permeated the skin readily, DBP penetrated effectively when emulsified, and DEHP showed minimal absorption. Importantly, the study confirmed that phthalates undergo hydrolysis by skin enzymes, forming monoester metabolites (MEHP, MBP, MEP) before systemic uptake. Urinary metabolite analyses indicated slow elimination kinetics, especially for DEP, with continued metabolite presence up to 24 hours post-exposure. These data reinforce that frozen *ex vivo* human skin models can reliably predict human *in vivo* absorption—an important validation for non-animal testing in dermal toxicology.

Dr. Hopf concluded that her results support improved accuracy in human exposure assessments and regulatory evaluations. Future studies will extend sampling beyond 24 hours and quantify parent compounds for mass-balance analyses. Overall, this work strengthens the scientific basis for replacing animal-based methods with human-relevant, mechanistically informed approaches, advancing the field toward more ethical and predictive toxicological assessments.

Human Relevance of *In Vivo* and *In Vitro* Skin Irritation Tests

Presented by: Hans Raabe

Hans Raabe, M.S., Chief Operating Officer of the Institute for In Vitro Sciences, delivered an insightful presentation examining the limitations of traditional animal-based irritation tests and the promise of modern, human-relevant new approach methodologies (NAMs). His talk, *"Human Relevance of* In Vivo *and* In Vitro *Skin Irritation Tests for Hazard Classification of Pesticides,"* explored the need to modernize dermal hazard classification through science-driven innovation. Raabe highlighted how species differences—including variations in epidermal thickness, follicle density, and barrier protein expression—undermine the predictive accuracy of the traditional Draize rabbit test. Retrospective analyses revealed poor reproducibility: EPA Category II substances were reclassified correctly in only 44.9% of cases, with frequent overlap into milder categories.



In contrast, validated *in vitro* and *in chemico* assays such as OECD TG 431 and 439, using reconstructed human epidermis (RhE) models like EpiDerm™, SkinEthic™, and LabCyte EPI-MODEL, offer superior human relevance and regulatory acceptance. Raabe also introduced the time-to-toxicity (ET50) concept, which enables dynamic tracking of tissue viability and more refined hazard categorization. Incorporating mechanistic biomarkers such as IL-1α release and cell viability metrics bridges the gap between molecular events and observable tissue responses.

Regulatory guidance is rapidly evolving, and Raabe emphasized that fit-for-purpose validation, guided by ICCVAM frameworks, will ensure NAMs are both biologically meaningful and reproducible. His closing message was clear: it is time to retire outdated animal assays and embrace scientifically robust, ethical, and predictive testing systems that better protect human health.

Collectively, these presentations highlight the continuing evolution of dermal toxicology toward mechanistically informed, human-relevant testing paradigms. The integration of validated *in vitro* systems, metabolic pathway characterization, and quantitative performance metrics represents a critical advancement in replacing traditional animal models. As regulatory agencies increasingly adopt NAM-based frameworks, the work presented by Dr. Hopf and Mr. Raabe provides a strong scientific foundation for improving hazard characterization, refining risk assessment practices, and enhancing the translational relevance of safety evaluations.

Looking ahead, DTSS is actively incorporating member feedback into future programming. We heard your suggestions for upcoming webinars on topics such as microplastics and metals, FDA requirements for skin toxicity studies, and collaborations with the Risk Assessment and Medical Device Specialty Sections. Keep an eye out for future events—and if you're interested in helping with any of these topics, or have other ideas in mind, please reach out! We're always eager to collaborate and highlight emerging areas of relevance in toxicological science.

Help DTSS Congratulate our Member's Great Achievements!

Alma Avila Oropeza is an official Doctoral Candidate at the School of Medicine & Dentistry, University of Rochester! She successfully passed her Comprehensive Exam on April 14th.

Andrew Roney is an official Doctoral Candidate at Michigan State University. He successfully passed his Comprehensive Exam on June 20th. He also recently won a competition hosted by 10X Genomics and the Van Andel Institute for a free spatial transcriptomics project. This data contributes to a long-term NM-induced dermal injury study.

Christina Awada has conferred her PhD at the Environmental Health Sciences Program, Graduate School of Arts and Science, NYU, in May 2025. She successfully defended her thesis titled *"Exposure to Electronic Cigarette Aerosols Triggers Alterations in Genomic DNA Methylation and MicroRNA Levels that Impact Cancer Pathways in Mice"* on April 7, 2025.

Clive Roper, founder of Roper Toxicology Consulting Ltd., was selected as one of the 2025 winners of the SME Visionary Leadership Awards. The Visionary Leadership Awards were launched to recognize and celebrate individuals who are not just responding to change but actively shaping the future of UK business. These are the trailblazers who lead with clarity, integrity, and ambition, turning challenges into opportunities and ideas into action. To learn more, visit: **Roper Toxicology 2025 SME Winner**. He also co-authored two recent publications:

- Dawick et.al., 2025. *Dermal absorption and metabolism of [14C]-C12 alkyl benzoate in Finsolv® TN in human skin in vitro*. *Toxicological Sciences*.
- Willett et. al. 2025. *The Decision Tree approach as a strategy for the global phase out of animal testing for acute and local toxicity for chemicals: recommendations from an expert workshop*. *Regul Toxicol Pharmacol*. 2025 Oct 22:105969. doi: 10.1016/j.yrtph.2025.105969.

Mayukh Banerjee co-authored a paper accepted in *Archives of Toxicology (2025)*: Goff R, Elmoustapha S, Thomas S, Banerjee M., 2025. *Arsenic disrupts autophagosome-lysosome fusion in a zinc dependent manner across multiple human skin and lung cell lines*. *Archives of Toxicology*. In Press.

AJ Cuevas was accepted as a Fellow of the Academy of Toxicological Sciences (ATS), September 2025. The Academy was established to recognize the accomplishments of senior toxicologists in three areas: Education & Continuing Education, Publications & Professional Development, and Demonstration of Professional Recognition. The ATS Fellow designation provides worldwide recognition of expertise and experience in toxicology through a highly selective, peer-review process. AJ also recently was approved to join the UK Register of Toxicologists with mutual recognition to the EUROTOX register.

Don't be modest, tell us your achievements/good news so we can celebrate you! Please email Andrew Roney (roneyand@msu.edu) to be featured in the newsletter.

DTSS Thanks Our Sponsors—We Appreciate your Generosity

DTSS proudly recognizes the exceptional publications and outstanding contributions of our ***members, postdoctoral trainees, and students*** *in advancing skin-related research.*

Thanks to our sponsors who continue to support this important work through awards and other giving opportunities.
If you or your company are interested in sponsoring an award, donating to the DTSS, please email Mayukh Banerjee.

RIFM Research Institute for Fragrance Materials · Edgewell Personal Care · Cutaneous & Ocular Toxicology (informa healthcare) · MB Research Laboratories (1972)

SOT MARCH 22–25 SAN DIEGO

Scan to join DTSS LinkedIn Page

Pack your sunglasses and your Science—SOT returns to San Diego

The 65th Annual SOT Meeting and ToxExpo will be held in San Diego. This year's meeting will be packed into four days, ending on the evening of Wednesday, March 25th. Book early and keep an eye out for DTSS event updates!

Save the Date for DTSS Reception
Monday, March 23, 2026, from 6:00-7:30 PM
Marriott Marquis San Diego

Meeting details, the program, and the online planner can be found here: Event App and Online Planner—2026 SOT Annual Meeting