

## Mechanisms Specialty Section

### ANNUAL REPORT: 2021–2022

May 1, 2021 to April 30, 2022

#### I. Officers/Committees

##### Office

President:  
President-Elect/Vice President:

Secretary/ Treasurer:

Past President:

Councilors:

Postdoctoral Representative:

Graduate Student Representative:

##### 2021–2022

Daniel David Petersen  
Cheryl E. Rockwell  
Rebecca L. McCullough  
Archit Rastogi  
Brian J. Day  
Kai Wu  
Juliane Beier  
Cassandra Meakin  
Kayla Frost

##### 2022–2023

Cheryl E. Rockwell  
Rebecca L. McCullough  
Archit Rastogi  
Grace A. Chappell  
Daniel David Petersen  
Juliane Beier  
Anna K. Kopec  
Alysha E. Simmons  
Joanna Woo

Committees, if applicable: NA

#### II. 2021 Membership total: 277

#### III. Key Outcomes in 2021–2022:

- A successful in-person business meeting and networking event was hosted at the annual meeting to re-engage with members after a few years of virtual meetings.
- A well-attended joint mentoring reception was held with members of BTSS and MSBSS at the annual meeting. This also helped foster engagement with the membership of other specialty sections.

#### IV. Activities

A. SOT Annual Meeting Activities (e.g., courses, scientific sessions, receptions):

| Day               | Time             | Session Type         | Title                                                                                                                                              |
|-------------------|------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Sun.<br>March 27  | 8:15AM -12:00PM  | Continuing Education | Safety Evaluation Strategies in Drug Discovery: From Target Assessment to Identification of Drug Candidates                                        |
| Sun.<br>March 27  | 1:15PM- 5:00PM   | Continuing Education | Leading-Edge Microbiome Methods for Toxicological Applications                                                                                     |
| Tues.<br>March 29 | 8:00AM- 10:45 PM | Workshop Session     | Human Neural Tube Defects: Basic Embryology to Predictive Toxicology                                                                               |
| Tues.<br>March 29 | 1:00 PM- 2:30PM  | Workshop Session     | Advances in CRISPR-Based Molecular and Computational Methods for Assessing Mechanistic Underpinnings of Toxicity and Gene-Environment Interactions |
| Wed.<br>March 30  | 8:00AM- 10:45AM  | Symposium Session    | Applications of Single Cell Profiling Methods to Enhance Mechanistic Understanding of Toxicological Responses                                      |
| Wed.<br>March 30  | 8:00AM- 10:45AM  | Symposium Session    | Cadmium and the Developmental Origins of Disease: The Implication of Early-Life Exposures on Health Later in Life                                  |
| Wed.<br>March 30  | 1:30PM- 4:15PM   | Symposium Session    | Competitive Displacement of Physiologic Metals as a Mechanism of Toxicity                                                                          |

|                  |                |           |                                                |
|------------------|----------------|-----------|------------------------------------------------|
| Wed.<br>March 30 | 6:00PM- 7:30PM | Reception | Mechanisms Specialty Section Meeting/Reception |
|------------------|----------------|-----------|------------------------------------------------|

New award inaugurated in 2022: Elsevier Postdoctoral Award

- Highlights postdoctoral scholars conducting mechanistic research
- Selections based on scientific quality of abstract and letters of support
- Applicants must submit an abstract and be postdoctoral scholars at the time of application
- 1 recipient
- \$1000 award

#### B. 2022 Awards Information

##### **Career Achievement Award**

None

##### **Sheldon D. Murphy Student Travel Award**

Christine Wei, Michigan State University

Thrombin-catalyzed fibrin polymerization controls fibrin(ogen) solubility dynamics in early acetaminophen hepatotoxicity.

*PI: James Luyendyk*

Eva Vitucci, UNC-Chapel Hill

A Novel *In Vitro* Model of the Alveolar Capillary Region: Bridging the Gap Between Inhalation Toxicology and Cardiovascular Disease

*PI: Shaun McCollough*

Melissa Wilkinson, Rutgers University

Mechanisms of Nitroalkene Inhibition of Macrophage Activation and Immunometabolism in Bleomycin Induced Interstitial Lung Disease

*PI: Andrew Gow*

Nick Mallek, UNC-Chapel Hill

Air-Liquid Interface Re-Submersion Alternatively Regulates Stress-Responsive Signaling, Enhances Cytokine Secretion, and Increases Barrier Permeability in Primary Human Bronchial Epithelial Cells

*PI: Shaun McCollough*

Shreyas Gaikwad, Texas Tech University, Health Sciences Center

A Novel Anti-Parasitic Drug Suppresses Pancreatic Cancer by Modulating the Immune Microenvironment

*PI: Sanjay Srivastava*

##### **Sheldon D. Murphy Post-Doc Travel Award**

David Leuthold, UFZ, Germany

A novel battery of behavior-based assays in larval zebrafish and its potential to elucidate neurodevelopmental toxicity mechanisms with a focus on deficits in learning and memory

*PI: Tamara Tal*

Emily Marques, University of Massachusetts, Amherst  
Evaluation of Perfluorooctanesulfonic acid (PFOS) and exenatide on  $\beta$ -cell proliferation  
*PI: Alicia Timme-Laragy*

Hazel Lin, University of Rochester  
Effects of Graphene and Molybdenum Disulfide on Macrophage Toxicity  
*PI: Alberto Bianco*

Lauren Poole, Michigan State University  
Canonical activation of protease-activated receptor-1 drives experimental liver fibrosis  
*PI: James Luyendyk*

#### **Ronald G. Thurman Award**

Dippro Bose, University of South Carolina, School of Medicine  
Prolonged broad spectrum antibiotic use exacerbates gut dysbiosis and gastrointestinal inflammation in symptom persistence of Gulf War Illness murine model  
*PI: Saurabh Chatterjee*

#### **Robert J. Rubin Student Travel Award**

Danielle Kozlosky, Rutgers University  
*In Utero* Cadmium Exposure Disrupts Development of the Placental Vasculature Leading to Growth Restriction in Male Offspring  
*PI: Lauren Aleksunes*

#### **Renal Toxicology Fellowship Award**

##### 1<sup>st</sup> Place

Kayla Frost, University of Arizona  
Renal Expression Changes in Patients with Confirmed Etiologies of Liver Disease  
*PI: Nathan Cherrington*

##### 2<sup>nd</sup> Place

Lauren Thompson, University of Colorado, Anschutz Medical Campus  
A Humanized Mouse Model to Evaluate Kidney Injury Due to Cancer Immunotherapies  
*PI: Melanie Joy*

#### **Gabriel Plaa Education Award**

##### 1<sup>st</sup> Place

Hao Wang, University of Washington, School of Public  
Cadmium-induced gut dysbiosis precedes the onset of cognitive deficits in mice  
*PI: Julia Cui*

##### 2<sup>nd</sup> Place

David Leuthold, UFZ, Germany  
A novel battery of behavior-based assays in larval zebrafish and its potential to elucidate neurodevelopmental toxicity mechanisms with a focus on deficits in learning and memory  
*PI: Tamara Tal*

3<sup>rd</sup> Place

Souvarish Sarkar, Harvard Medical School

A multiplex model in a *Drosophila* identifies novel gene-environment interactions: A step towards personalized medicine

*PI: Mel Feany*

**Carl C. Smith Student Award**

1<sup>st</sup> Place

Nga Nguyen, Kansas University Medical Center

Recovered Hepatocytes Promote Macrophage Apoptosis through CXCR4 after Acetaminophen-induced Liver Injury in Mice

*PI: Hartmut Jaeschke*

2<sup>nd</sup> Place

Emily Stevenson, Rutgers University

Cholesterol Esterification as a Pharmacological Target in Acute Lung Injury

*PI: Andrew Gow*

3<sup>rd</sup> Place

Jaclynn Andres, Rutgers University

Mechanisms of Nitroalkene Inhibition of Macrophage Activation and Immunometabolism in Bleomycin Induced Interstitial Lung Disease

*PI: Deborah Laskin*

**Elsevier Postdoctoral Award**

Milankumar Prajapati, Brown University

Slc39a14 Deficiency Impairs Biliary Excretion of Iron Rich Ferritin in Mice

*PI: Thomas Bartnikas*

C. Other Educational Activities Conducted (e.g., webinars, in-person meetings):

None

D. Communication Activities:

1. Newsletter publication frequency: **biannually**
2. New or significant announcements/blogs: **Consistent with SOT Communications**
3. Highlights of website enhancements: **None**

E. Mentoring Activities:

1. **Mechanisms co-sponsored and organized a Mentoring Reception with the Biotechnology Specialty Section and the Molecular and Systems Biology Specialty Section during the Annual Meeting on March 30<sup>th</sup> from 7-9 PM. The event featured roundtable discussions between mentors and trainees, and appetizer style food and drinks, and was very well-received with many Mechanisms members participating as mentors. A total of 45 mentors and 105 trainees participated in the event. We plan to continue with similar receptions at future meetings.**

F. (*Regional Chapters only*) Activities Supporting Undergraduate Students: **NA**

**V. Feedback and Ideas:**

A. In what ways is your group fostering and maintaining an inclusive environment? Please give examples of any current practices used to support inclusion in processes such as 1) leadership selection and promotion, 2) award descriptions and selection, and 3) endorsement of proposals for the annual meetings.

- Mechanisms Specialty Section has been an inclusive environment. A quick look at the names and affiliations of our award winners will show a wide representation of schools and ethnicities.
- Our leadership represents a cross-section of individuals at different career stages (early-, mid- and late) and at different organization types (academia, government, industry, consulting). Efforts are made to recruit individuals from diverse backgrounds every year for the ballot.
- At the joint mentoring reception organized during the annual meeting, significant care was taken to ensure members who served as mentors represented diverse practices of toxicology, had varying experience levels, and included international members.

B. How might SOT better support your group's activities (perhaps something the Society should be doing that we currently do not do, or do not do effectively, that would be of importance/benefit to the members of your component group?):

*Note: If funding is listed, please provide detail on the membership need that the funding would support.*

One issue that was mentioned repeatedly by membership at the annual meeting in San Diego was the spike in travel costs. Airfare and hotel rates have increased substantially following the pandemic. This places budgetary pressure on members who pay the own way or who have limited travel budgets. Some members indicated that they may need to cut costs by attending the meeting every other year (rather than annually). It seems as though this is something to keep an eye on.

While an easy solution does not seem feasible, perhaps needs-based travel funding could be considered for some "non-trainee" members (current travel support available to students, post-docs, etc. should be continued) Recognizing that the next several meetings are already booked, it may also be worth considering less expensive venues in the future.

C. What is one thing that the Society is currently doing that impacts your component group that should be changed (e.g., stopped, modified, etc.)?

NA

D. What changes do your component group anticipate making in the way in which it operates in the coming year?

Mechanisms SS has instituted monthly meetings to ensure sufficient communication between leadership members. At these meetings, outstanding tasks and responsibilities are reviewed and appropriately delegated to ensure things run smoothly. There are discussions underway regarding events Mechanisms SS could sponsor to engage the membership.