

## Biological Modeling

### ANNUAL REPORT: 2022–2023

May 1, 2022 to April 30, 2023

#### I. Officers

<u>Officer</u>	<u>2022–2023</u>	<u>2023–2024</u>
President:	Patricia Ruiz	Zhoumeng Lin
Vice President:	Zhoumeng Lin	John Wambaugh
Vice President-Elect:	John Wambaugh	Stephen Edwards
Secretary/Treasurer:	Dustin Kapraun	Dustin Kapraun
Past President:	Qiang Zhang	Patricia Ruiz
Councilors:	Sudin Bhattacharya	Sudin Bhattacharya
	Suresh K Nagumalli	Wei-Chun Chou
Postdoctoral Representative:	Wei-Chun Chou	Qiran Chen
Graduate Student Representative:	David Filipovic	David Umbaugh

#### II. 2022 Membership total: 137

#### III. Key Outcomes in 2022–2023:

- A. BMSS reviewed 9 session proposals submitted for sponsoring and 8 were approved by SOT.

##### As primary endorser:

Continuing Education AM02: A Training on the OECD Guidance for Characterizing, Validating, and Reporting Physiologically Based Kinetic Models. Chair(s): Cecilia Tan, US EPA; and Alicia Paini, esqLABS GmbH, Germany. Primary Endorser: Biological Modeling Specialty Section. Other Endorser(s): Risk Assessment Specialty Section; Women in Toxicology Special Interest Group

Continuing Education PM12: Making the Most of Your Data: How to Build Machine-Learning Models for Toxicology. Chair(s): Catrin Hasselgren, Genentech Inc.; and Nigel Greene, AstraZeneca. Primary Endorser: Computational Toxicology Specialty Section. Other Endorser(s): Biological Modeling Specialty Section; Drug Discovery Toxicology Specialty Section

Workshop session: Understanding the Concept of Similarity and Its Applications to Toxicological Research and Risk Assessment. Chairs: Kamel Mansouri and Denis Fourches.

##### As secondary endorser:

Symposium session: Challenges in the Development of *In Vitro-In Vivo* Extrapolation Models for Next Generation Risk Assessment. Chairs: John Wambaugh and Mathieu Vinken

Symposium session: Achieving Successful Reproducibility for Next-Generation Toxicological Methods. Chairs: Agnes Karmaus and Rance Nault

Workshop session: Crucial Role of Physiologically Based Pharmacokinetic Modeling in Human Health Risk Assessment in Different Sectors. Chairs: Andreas Schepky and John Wambaugh

Symposium session: Tackling the Challenge of Assessing Human-Relevant Thyroid Disruption. Chairs: Brandy Riffle and Chad Deisenroth

Symposium session: Toxicology 2.0: Moving from Reductionist to Holistic Paradigms. Chairs: Weihsueh Chiu and Ana Navas-Acien

- B. Continued membership and support of Specialty Section Collaboration and Communication Group.
- C. The BMSS membership has decreased from 151 in 2021 to 137 in 2022; some professional members retired, and students completed their programs recently.
- D. Overall, the financial health of BMSS might be described as “moderate” to “poor”. The balance of the operating fund account is \$3,259 as of May 2023 (versus \$7,281 as of May 2022). The reason for the decline in financial health is that BMSS revenues have decreased in recent years. Revenue from membership dues has been relatively stable for several years (including during the pandemic), and it was greater in 2023 than in 2019 (before the start of the pandemic), but there has been less income from SOT Annual Meeting registration fees and SOT “supplements” for the receptions at the SOT Annual Meetings due to changes in SOT profit sharing policies. In fact, SOT did not share any such revenue with BMSS in 2020 through 2023, whereas there was approximately \$2,000 in BMSS total annual revenue from registration fees and supplements in both 2018 and 2019. The only sources of BMSS revenue are membership dues, interest, and member donations. If BMSS revenues from membership dues and interest at the end of 2023 are comparable to those seen at the end of 2022, about \$2,900 will be credited to the operating fund account before the next SOT Annual Meeting. Unfortunately, the projected balance of \$6,159 will not be sufficient to cover the projected costs of BMSS events at the next Annual Meeting. BMSS officers are working to find new revenue sources.

#### **IV. Activities**

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

##### **BMSS Reception**

Date: March 21, 2023

Time: 6:00 PM – 7:30 PM

Location: Broadway Ballroom H, Omni Nashville Hotel. Nashville, TN

Cost: \$5,554 (including food, audio & video equipment rental, and awards materials)

Summary: BMSS held a brief summary of business which included BMSS-hosted activities, acknowledging past Executive Committee members, treasury report, and announcing all the award winners. The meeting was followed by a Trivia Quizzes event for entertainment, learning about SOT and BMSS, and networking. It exceeded anticipated attendance this year.

## **Mentoring Luncheon**

Location: Broadway Ballroom K at the Omni Hotel. Nashville, TN

Time: Noon, March 20, 2023

Attendees: 30 mentees and 14 mentors from various sectors including BMSS officers

Cost: \$1,375 (including food and audio & video equipment rental and deducting the amount provided as “matching funds” by SOT)

### **B. 2023 Awards Recipients:**

- Gehring Award (two winners)  
Pavani Gonnabathula (postdoc)  
Postdoctoral Fellow at US FDA/NCTR. Mentor: Dr. Miao Li. “Development and Application of a Paxlovid PBPK Model for Modeling-Based Dose Recommendations in the Pediatric Population”.
- Xue Wu (PhD student)  
Student at University of Florida. Mentor: Dr. Zhoumeng Lin. “Development of a Physiologically Based Pharmacokinetic PBPK Model for Flunixin in Cattle and Swine following Dermal Exposure”.
- Andersen-Clewell Joint Award with RASS  
Elise Hickman, Postdoctoral Fellow at University of North Carolina at Chapel Hill. Mentor: Dr. Julia Rager. “Interindividual Variability Assessments through Benchmark Dose-Response Modeling of Primary Human Bronchial Epithelial-Fibroblast Co-culture Responses to Acrolein”.
- Best Trainee Abstract Award  
Susana Proença (postdoc)  
Postdoctoral Fellow at Wageningen University and Research, Netherlands. Mentor: Dr. Nynke Kramer. “A Mechanistic and Probabilistic PBPK Model for Amiodarone for Quantitative In Vitro to In Vivo Extrapolation”.
- Best Paper Award Winner:  
Kapaun, D. F.; Zurlinden, T. J.; Verner, M. A.; Chiang, C.; Dzierlenga, M. W.; Carlson, L. M.; Schlosser, P. M.; Lehmann, G. M., A Generic Pharmacokinetic Model for Quantifying Mother-to-Offspring Transfer of Lipophilic Persistent Environmental Chemicals. *Toxicol Sci* 2022, 189, 155-174.
- Best Paper Award Honorable Mentions

Kapraun, D. F., Sfeir, M., Pearce, R. G., Davidson-Fritz, S. E., Lumen, A., Dallmann, A., ... Wambaugh, J. F. (2022). Evaluation of a rapid, generic human gestational dose model. *Reproductive Toxicology*, 113, 172–188.

- Borba, J. V. B., Alves, V. M., Braga, R. C., Korn, D. R., Overdahl, K., Silva, A. C., ... et al. (2022). STopTox: An in silico alternative to animal testing for acute systemic and topical toxicity. *Environmental Health Perspectives*, 130(2), 027012.

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

**BMSS Webinar #1**

Date and Duration: March 9, 2022 (1 hours)

Title: Improving Best Practices in Mathematical Modeling

Speaker: Herbert Sauro, PhD

Number of Attendees: 55

**BMSS and RASS Co-sponsored Webinar**

Date and Duration: December 14, 2022 (1.5 hours)

Title: Generic Pharmacokinetic Models for Mother-to-Offspring Transfer of Chemicals

Speaker: Dustin Kapraun, PhD

Number of Attendees: Not available

D. Communication Activities:

1. Newsletter publication frequency: Once per year
2. Communication Highlights: N/A
3. Highlights of website enhancements: The BMSS website has been maintained and updated as needed.

E. Mentoring Activities: Mentoring Luncheon during SOT Annual Meeting

Location: Broadway Ballroom K at the Omni Hotel. Nashville, TN

Time: Noon, March 20, 2023

Attendees: 30 mentees and 14 mentors from various sectors including BMSS officers

**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.

Activities like membership, student awards, and virtual presentations are all encouraged by BMSS. Future BMSS officer meetings will discuss strategies to increase the diversity and inclusion of the organization's membership, mentorship, and accomplishments, including language changes for award descriptions, outreach, and membership enrollment.

- B. What is one thing 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?

BMSS appreciates the continued support of the student awards, webinar setups, and preparation of all our activities. The current process to send our messages to the members is not very efficient and requires approval by SOT and some lead time.

The financial statements that are provided to BMSS officers through ToXchange, which describe the operating funds (“general ledgers”) and the endowment funds that support BMSS awards, are quite disorganized and difficult to interpret. It would be helpful if SOT could update the format for these statements such that codes and categories used in “financials” and “general ledgers” statements are clearly defined and column headings in “general ledgers” statements align with column contents. It would be even better if SOT could provide alternative methods for BMSS officers to access transaction history and current balances for BMSS accounts. For example, it would be very helpful if SOT could provide real-time access to account statements, such as the data access made available by banks through “online banking” applications. If this is not feasible, hopefully SOT can at least work to make the financial statements easier to read and interpret by applying some of the proposed formatting changes.

- 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.)?

SOT no longer shares profits from Annual Meeting revenues with Specialty Sections. This has had a significant impact on the financial health of BMSS. Perhaps SOT can consider reintroducing profit sharing when and if financial circumstances make this possible.