

Reproductive and Developmental Toxicology Specialty Section

ANNUAL REPORT: 2020-2021

May 1, 2020 to April 30, 2021

I. Officers/Committees:

<u>Officers</u>	<u>2020-2021</u>	<u>2021-2022</u>
President:	Reza John Rasoulpour	Bethany R. Hannas
Vice President:	Bethany R. Hannas	Caren M. Villano
Vice President-Elect:	Caren M. Villano	Sarah Champion
Secretary/Treasurer:	Pragati Coder	Pragati Coder
Past President:	Aileen F. Keating	Reza John Rasoulpour
Councilors:	Xiaozhong Yu	Edward Dere
	Edward Dere	AtLee Watson
New Career Councilor:	Daniel J. Spade	Daniel J. Spade
PDA Representative:	AtLee Watson	Michelle Kossack
Grad Student Representative:	Vasiliki Mourikes	Vasiliki Mourikes

II. 2020-21 Membership total: 357

III. Key Outcomes in 2020-2021:

- Emphasis on trainee development through award programs and poster competition
- Virtual engagement with membership during 2019-2020 planning and annual meeting event

IV. Activities:

A. 2021 SOT Virtual Annual Meeting Activities:

- **Reproductive and Developmental Toxicology Specialty Section Meeting**
Date and Time: Wednesday, March 17, 2021 from 4:30 pm – 5:30 pm ET
Summary: The virtual event included a presentation of the annual activities and an awards ceremony.
- **2021 SOT Annual Meeting Virtual CE Courses and Symposia offered:**

Title	Format
RTSS Primary Endorsement	
Development, Toxicology, and Pathology of the Female Reproductive Tract: Interpretation of Findings from the Pathologist and Regulatory Perspectives	Continuing Education
Risk Assessment, DART, and Endocrine Disruption: A World View	Continuing Education
Botanicals, Pregnancy, and Reproductive and Developmental Health	Symposium
Developmental Toxicity Hazard Assessment Without Animals: Pathways and Prospects	Symposium
Environmental Influences on Placental Origins of Development	Symposium
From Conception to Cane: Unique Life Stage Considerations for Reproductive Toxicity	Symposium
RTSS Secondary Endorsement	
Identifying and Communicating Adverse Neurological Outcomes from Parental Cannabis Use	Symposium

Testing the Waters: How the Zebrafish, Xenopus, and Medaka Models are Advancing Our Understanding of Reproductive and Developmental Toxicity	Symposium
Zebrafish in Toxicology: Are We There Yet? Global Perspective and Recent Advancements	Symposium
Across the Lifespan: Emerging Mechanisms of Prenatal and Transgenerational Toxicity Botanicals, Pregnancy, and Reproductive and Developmental Health	Symposium

President's Report (Reza Rasoulpour):

The 2021 SOT Annual Meeting was once again held virtually due to the Covid-19 pandemic. The awards were announced virtually through a webinar and recognized. Officers who finished their terms in 2021 and new officers were recognized virtually and will also be thanked at the in-person 2022 RDTSS reception.

Due to the virtual format for the meeting in 2021, The Ed Carney Trainee Award, which is organized as a joint award between RDTSS and the Society for Birth Defects Research and Prevention, was deferred to 2022.

Vice President's Report (Bethany Hannas):

Dr. Hannas created and led the RDTSS Program Committee which generated proposal ideas and reviewed submissions for the SOT 2021 program. This committee was comprised of RDTSS officers and additional volunteers. Several sessions discussing proposal submissions, including submission ideas, timelines, and SOT requirements were held to assist new members with the process and encourage interactions with more experienced RDTSS members. Dr. Hannas coordinated receipt and pre-review of the proposals and these activities resulted in the request for endorsement of 2 CE Courses, 10 Symposia, and 3 Workshops provided by SOT HQ, along with the instructions for providing scoring and comments.

The members of the RDTSS Program Committee then emailed Dr. Hannas their scores and comments. Individual comments were consolidated for each proposal, along with a final RDTSS score and a subsequent meeting was held to review and discuss the proposals and comments. Dr. Hannas entered the final scores and comments on the SOT proposal ranking website.

2022 SOT Annual Meeting Courses/Sessions:

Among 15 proposals submitted for RDTSS ranking and endorsement for 2022 SOT program, 11 were tentatively accepted into program as of July 2021. Sessions submitted from RDTSS as primary, or secondary endorser are listed in the following table:

Title	Format
RDTSS Primary Endorsement	
Importance of Sexual Maturity and Reproductive Senescence in Laboratory Animal Models	Continuing Education
Juvenile Toxicology Testing Assessing Pediatric Safety	Continuing Education
Hypertensive Disorders of Pregnancy: Biomarkers, Models, and Environmental Influences	Symposium
Role and mechanisms of persistent epigenetic alterations in toxicological responses.	Symposium
State of the Science on Thyroid Hormone Regulation and Disruption During Neurodevelopment	Symposium
The Microbiome in Toxicity and Disease: A Yin and Yang Duality for the Host Throughout the Lifespan	Symposium

Technological Advancements and Strategic Approaches in Developmental and Reproductive Toxicity Assessments	Workshop
Human Neural Tube Defects: basic embryology to predictive toxicology	Workshop
RDTSS Other Endorser	
Cadmium and the Developmental Origins of Disease: The Implication of Early Life Exposures on Health Later in Life	Symposium
Developmental origins of inflammatory and immune diseases: identifying the effects of in utero stress on immunological competency	Symposium
Current Status and Future Outlook on Developmental Immunotoxicity Testing	Workshop

Dr. Hannas coordinated the New Career Scientist Award sponsored by Covance. The award recognizes an active, regular member of the RDTSS for outstanding research and scientific contribution completed since graduate and/or postdoctoral training. The criteria for the award are originality, discovery, and excellence in the field of Reproductive and Developmental Toxicology as evidenced by peer-reviewed manuscripts in journals of high caliber, teaching, mentorship, contributions to regulatory DART practice/guidelines, and/or other commensurate evidence of expertise in the field. Individuals working in academia, government, and industry will be equally eligible to compete for this award. Candidates must be no more than ten years from the date of their last formal training.

A sub-committee to judge applicants consisted of:

Dr. Aileen Keating, Iowa State University

Dr. Pragati Coder, Charles River Laboratories, Ashland

Dr. Edward Dere, Genentech

Dr. Reza Rasoulpour, Corteva Agriscience

Dr. Daniel Spade, Brown University

Four applicants were considered, and the 2021 award was present to Dr. Phoebe Stapleton, Rutgers University.

Vice President-Elect's Report (Caren Villano):

Dr. Villano coordinated the Student/Postdoctoral Fellow Poster Awards. This award recognizes undergraduate and graduate student members of SOT with exceptional poster presentations based on original work that is significant to the field of reproductive toxicology. The criteria for the award include overall poster appearance, quality of content, as well as presentation skills.

A sub-committee of judges was created, consisting of:

Dr. Caren Villano, Boehringer Ingelheim

Dr. Pragati Coder, Charles River Laboratories

Dr. Kary Thompson, Janssen Pharmaceuticals

Dr. Shuo Xiao, Rutgers University

Dr. Kaushal Joshi, RIFM

Dr. Atlee Watson, ILS, Inc

Dr. Bethany Hannas, Corteva Agriscience

Dr. Vicki Sutherland, NIEHS-NTP

This year, 10 applicants' posters were considered, and the 2021 awardees were:

Graduate Student Awardees

1st place: Xiaotong Wang, McGill University

Benchmark Concentration analyses of the effects of organophosphate esters on the phenotype and function of KGN human granulosa cells

2nd place: Benjamin Elser, University of Iowa

Comparative Assessment of Alpha-Cypermethrin and Permethrin on Development of the Placenta and Fetal Brain in Mice

Postdoctoral Fellow Awardees

1st place: Elana Elkin, University of Michigan School of Public Health

Transcriptional profiling of the response to the trichloroethylene metabolite S-(1,2-dichlorovinyl)-L-cysteine revealed activation of the eIF2 α /ATF4 integrated stress response in two in vitro placental models

2nd place: Genoa Warner, University of Illinois

Environmentally Relevant Mixtures of Phthalates and Phthalate Metabolites Differentially Alter the Cell Cycle and Apoptosis in Mouse Neonatal Ovaries

Of note, this year RDTSS received additional sponsorship for the Student/Postdoc poster award. Elsevier has agreed to contribute funding to this trainee award pool starting in 2022 and in place until 2025.

Senior Councilor's Report (Xiaozhong (John) Yu):

Dr. Yu coordinated the best paper award process which evaluated papers published in print during 2020 in Toxicological Sciences. To be considered for the award, a paper must:

- Have at least one member of RDTSS as an author
- Be in a subject relevant to the specialty section
- Be a primary research publication (review articles were not considered)

Dr. Yu queried the 2020 membership roster by name and affiliation on the Toxicological Sciences Table of Contents website. Thirty-one Manuscripts in the areas of Reproductive or Developmental Toxicology appeared in Toxicological Sciences in 2020, and thirteen Manuscripts by RDTSS members were eligible for the award.

Thirteen RDTSS Members made up the judging committee. Any conflicts were addressed, and papers were randomly distributed. Each paper was reviewed by at least 3 individual judges. Each judge reviewed up to 4 papers each.

The judging committee members:

- | | |
|-----------------------------|------------------------------|
| • Barbara F Hales | • Reza J. Rasoulpour* |
| • Chrissy J. Cochra* | • Sarah Champion * |
| • Dan Spade* | • Shuo Xiao |
| • George Daston* | • Xiaoqin Ye |
| • Jennifer Rayner | |
| • Jodi Flaws | |
| • Kim Boekelheide * | |
| • Lu Cai* | |
| • Natasha Catlin* | |

*Second round judging members

Manuscripts were judged on the following 4 criteria, each on a scale of 1 to 10:

- Originality (Novelty/Innovation)
- Scientific Quality (Experimental Approach)
- Relevance to the field
- Contribution/Significance to the field

Three (3) individual scores for each manuscript were averaged, and totals were calculated for each manuscript. The top 4 manuscripts from Round 1 were identified. One paper was dropped for further consideration due to the potential COI, and the top 3 papers were redistributed to 8 judges. Same criteria were applied, and scores were averaged and ranked. The manuscript with the highest number of Rank 1 scores in Round 2 was selected as the winner, with the same criteria being used for second and third place winners.

Third Place:

Leon E Gray, Johnathan R Furr, Christy S Lambright, Nicola Evans, Phillip C Hartig, Mary C Cardon, Vickie S Wilson, Andrew K Hotchkiss, Justin M Conley, ***Quantification of the Uncertainties in Extrapolating From In Vitro Androgen Receptor Antagonism to In Vivo Hershberger Assay Endpoints and Adverse Reproductive Development in Male Rats***. *Toxicol Sci.* 2020 Aug1;176(2):297-311. doi: 10.1093/toxsci/kfaa067.

Second Place:

Han Yan, Barbara F Hales, ***Exposure to tert-Butylphenyl Diphenyl Phosphate, an Organophosphate Ester Flame Retardant and Plasticizer, Alters Hedgehog Signaling in Murine Limb Bud Cultures***. *Toxicol Sci.* 2020 Dec 1;178(2):251-263. doi: 10.1093/toxsci/kfaa145

First Place:

Jingshan Xu, Yingzheng Wang, Alexandra E Kauffman, Yaqi Zhang, Yang Li, Jie Zhu, Kimberly Maratea, Kristin Fabre, Qiang Zhang, Teresa K Woodruff, Shuo Xiao. ***A Tiered Female Ovarian Toxicity Screening Identifies Toxic Effects of Checkpoint Kinase 1 Inhibitors on Murine Growing Follicles***. *Toxicol Sci.* 177 (2), October 2020, Pages 405–419, <https://doi.org/10.1093/toxsci/kfaa118>

Junior Councilor's Report (Ed Dere):

Dr. Dere coordinated nominations for the Lifetime Scientific Achievement Award from the RDTSS membership. RDTSS member for lifetime achievement or for the contribution of a particularly influential body of work to the field of reproductive and developmental toxicology.

The awardee is selected from among membership nominations by a committee formed by the RDTSS Executive Committee. Nominations included a short narrative or list of the accomplishments upon which the nomination was based, a CV, and letter(s) of support. The Scientific Achievement Award winner was selected based on lifetime achievement or for the contribution of a particularly influential body of work in the field of reproductive and developmental toxicology, contributions to the RDTSS and SOT (Leadership/Service), and role in mentoring new scientists. Nomination packages were reviewed by a 6-member RDTSS Sub-committee for overall ranking and selection of the awardee and presented for final approval to the RDTSS Executive Committee.

2021 Award Recipient - Dr. Alan Hoberman, Charles River Laboratories

The members of the 2021 Achievement Award Sub-committee were:

- B. Dr. Reza Rasoulpour (Corteva Agriscience)
- C. Dr. Dan Spade (Brown University)
- D. Dr. Aileen Keating (Iowa State University)
- E. Dr. Bethany Hannas (Corteva Agriscience)
- F. Dr. Caren Villano (Boehringer Ingelheim)
- G. Dr. Ed Dere (Genentech)

New Career Councilor's Report (Daniel Spade):

Dr. Spade coordinated nominations for the Inotiv Stephen B. Harris Mid-Career from the RDTSS membership to recognize an active regular member of the RDTSS for outstanding research and scientific contributions. The award stipulates those candidates be between at least ten years and no more than twenty years from the date of their last formal training (including post-doctoral experience). Packages for three nominees were submitted in prior years, within the three-year window during which applications will be considered for the award. Two applicants remained eligible, while the third had exceeded the twenty-year limit since the end of training. The two eligible applications were reviewed by an 8-member committee, consisting of 6 RDTSS officers, a representative from Inotiv, and the New Career Councilor.

The members of the 2020 Stephen B. Harris Mid-Career Award Sub-committee were:

- Pragati Coder (Charles River)
- Edward Dere (Genentech)
- Bethany Hannas (Corteva)
- Caitlin Murphy (Inotiv)
- Reza Rasoulpour (Corteva)
- Daniel Spade (Brown University)
- Caren Villano (Boehringer-Ingelheim)
- Xiaozhong Yu (University of New Mexico)

The overall rankings and selection of the awardee were presented to the RDTSS Executive Committee. The award winner was presented with a plaque and check.

Award winner: Dr. Christopher Bowman (Pfizer)

Secretary/Treasurer's Report (Pragati Coder):

Membership increased slightly from last year but remained consistent with historical trends.

Membership Type	July 2018	July 2019	July 2020	July 2021
Full	234	250	237	249
Associate	28	24	28	24
Emeritus/Retired	0	1	3	3
Student	58	51	56	58
Postdoctoral fellow	34	40	29	29
Total	354	366	353	363

A summary of RDTSS finances as of Apr 30, 2021.

RDTSS Funds 70-854-0	Dec 31, 2019	Jun 30, 2020	Apr 30, 2021
Income			

Contributions	\$4,500	\$6,500	\$6700
Membership Dues	\$0	\$5,880	*Pending
Interest	\$0	\$1,385	*Pending
Expense			
Awards	\$0	\$2,500	\$7000
Plaques	\$0	\$211	\$285
Contributions	\$175	\$175	\$0
Miscellaneous	\$0	\$0	\$31
Revenue Over Expenses	\$4,325	\$10,879	(\$616)
Net Assets Beginning of Year	\$18,214	\$18,214	\$29,593
Net Assets End of Year	\$22,539	\$29,093	\$28,977

* Income from Membership Dues and Interest is expected by End of Financial Year 2021 (Jun 2021).

Summary of RDTSS Endowment Fund (Edward Carney Trainee Award Fund) as of March 31, 2021.

Endowment Fund 85-039-1	Dec 31, 2019	Jun 30, 2020	Mar 31, 2021
Income			
Contributions	\$1000	\$1000	\$750
Employer Matching Funds	-	-	-
SOT Matching Funds	-	-	-
Gain (Loss) on Investments			
Interest and Dividends	\$2,144	\$2,792	\$3,382
Gain/(Loss)	\$4,084	(\$1,136)	\$15,580
Expense			
Awards	\$1000	\$1000	-
Revenue Over Expenses	\$6228	\$1,657	\$19,712
Transfers between Funds	\$21	\$21	-
Net Assets Beginning of Year	\$98,402	\$98,402	\$100,079
Net Assets End of Year	\$104,651	\$100,079	\$119,791

Student/Postdoc Report (Vicky Mourikes and AtLee Watson):

There are no significant or outstanding information for this section in 2021.

V. Feedback and Ideas:

- A. **In what ways is your group fostering and maintaining an inclusive environment?**
RDTSS reviews program proposals and award nominations with an eye towards inclusion of technical background, affiliation (e.g., government, academia, industry), and gender.

- 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.

It would be extremely helpful if SOT could provide the metrics of our membership, so we understand 'availability' of our membership across a number of diversity axes. Knowing the affiliation of our RDTSS population, years of experience, gender, within US versus outside of US, ethnicity, so that we can assess how well we are doing and making sure RDTSS is appropriately representing the population of our Specialty Section in the areas of leadership, award nominations, proposals, etc.

- 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.)?**

It would be good to get a common set of ideas on what other Specialty Sections are doing to engage their members. Perhaps a shared information session across Specialty Section officers would be helpful.

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

Due to fewer than historical nominations for award positions, likely due to COVID and lack of in-person meeting, we are planning to hold a 'RDTSS Mixer' in September. We can create breakout rooms for networking opportunities as well as share the information on award nomination criteria to our membership.