



Dear IVAM Members,

Greetings and welcome to our spring newsletter. This past year has been difficult for everyone and all of us on the IVAM Executive Committee sincerely hope that you and your families are doing well.

In spite of the challenges IVAM has had a productive year, highlights of which include the following:

In May, we put on an IVAM virtual reception where our 2020 graduate student and postdoctoral award winners gave presentations about their work. In October, we conducted a survey of IVAM members that provided useful feedback and webinar ideas. In December, IVAM members approved an update to our Bylaws that eliminated the vice graduate student and vice postdoctoral positions. Lastly, in January we sponsored a webinar titled *"Big Data and Toxicology—The Future Is Now,"* which was presented by Thomas Hartung and Thomas Luechtfeld. This webinar was timely, interesting, and well-attended. If you missed it, the slides and a recording are available on [IVAM's website](#).

This newsletter contains information on IVAM membership, SOT activities, an expert column, member spotlight, plus postdocs & graduate students.

Upcoming summer 2021 events include a webinar titled: *"State of the Science: QSAR Modeling of Skin Sensitization"* and a virtual *Meet the Experts* mentoring session for graduate students and postdocs.

Recently IVAM created a [LinkedIn page](#) as an additional way to communicate with you and raise awareness. We plan to begin posting newsletters and notices on this page soon, so please connect with us there.

At this year's SOT Virtual Meeting, the IVAM Reception will be held on March 17th, 2021 from 8:30 – 9:30 AM ET. This event will be on Zoom and there will be a Breakout Room open from 8:00 – 8:30 AM and 9:30 – 9:45 AM ET. We would enjoy seeing you before the meeting, so please join us in the Breakout Room!

Sincerely,

*Kelly Coleman, PhD, DABT, ERT*

**IVAMSS President, 2020-2021**

<b>2020-2021 IVAM Officers</b>	
<b>President</b>	Kelly Coleman
<b>Vice President</b>	Sean Gehen
<b>Vice President-Elect</b>	Kathryn Page
<b>Secretary/Treasurer</b>	Helena Hogberg
<b>Councilors</b>	Samantha Faber Stephen Ferguson
<b>Post-Doctoral Representatives</b>	Megan Culbreth Daniel Russo
<b>Student Representative</b>	Amanda Dhaneshwar



IVAMSS 2021 NEWSLETTER

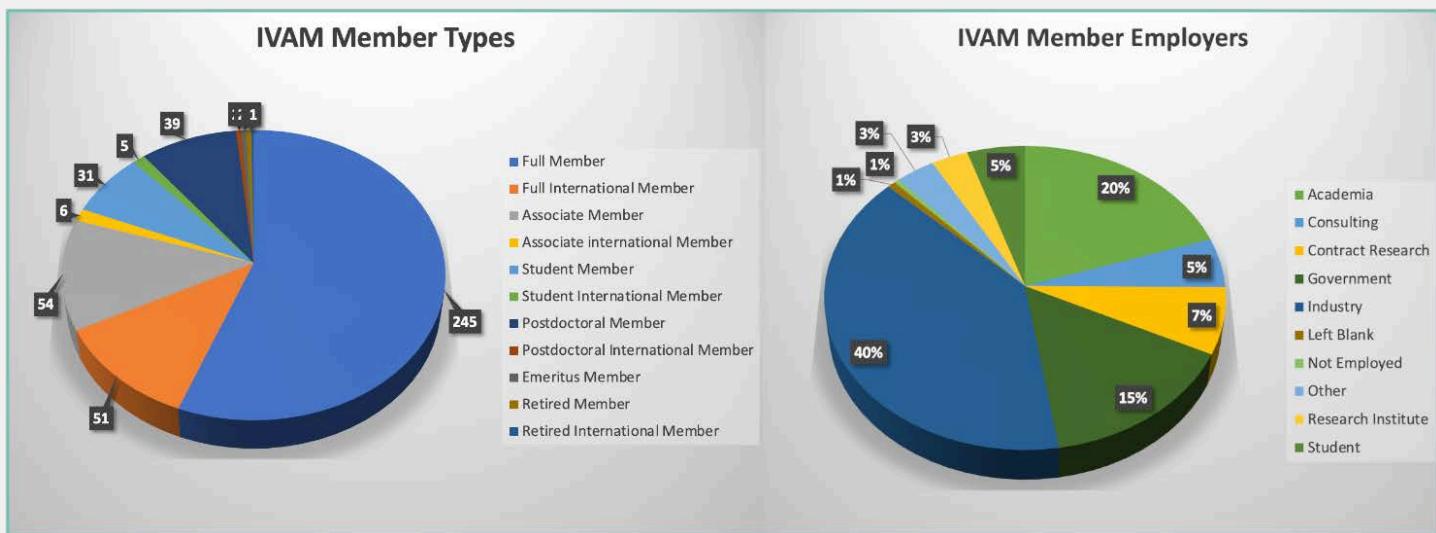
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## IVAMSS News and Announcements

### Membership Update by Kelly Coleman

The IVAMSS was **founded in 1994** and grew steadily until 2016 when membership **peaked at 524**. However, since then IVAM's headcount has fallen by about 15%. We believe that this drop was due primarily to the creation of the Computational Toxicology Specialty Section in 2018. As of December 2020, IVAM had **438 members**. Our members come from industry, academia, government, and consulting. Over half are Full Members and one sixth are International Members. The two charts below provide a summary of IVAM's December 2020 membership.



### 2019-2020 Annual Report Highlights by Kelly Coleman

Due to Covid-19 last year was a challenge, nevertheless there were a variety of IVAM activities worth noting:

**We reviewed 31 session proposals** submitted in April 2019 for SOT's 2020 Annual Meeting. Of these, IVAM endorsed 29.

As of December 2019, we had 447 members.

**In January 2020 we sponsored three webinars:**

- (1) The winner of the 2019 Student Research Award, **Eva Vitucci** from the University of North Carolina at Chapel Hill, presented a webinar titled: *“Piecing Together the Puzzle: Identifying the Role Oxidative Stress and the Alveolar Epithelium Play in Air Pollution Induced Cardiovascular Disease.”*
- (2) The winner of the 2019 Postdoctoral Award, **Jinpeng Li** from the Dow Chemical Company, presented a webinar titled: *“Functional Comparison of HepaRG Cells and Primary Human Hepatocytes in Monolayer and Spheroid Culture as Repeated Exposure Models for Hepatotoxicity.”*

(3) A webinar titled: "NAMs Cast Study: Industry/Government Partnerships" was presented by **Monique Perron** from US EPA and **Douglas Wolf** from Syngenta. The slides and recordings of these webinars are available on the [IVAMSS website's Events page](#).

**In May 2020 we had a Virtual Annual Meeting** during which the winners of IVAM's student awards spoke about their projects. The winner of the Graduate Student Award was **Sarah D. Burnett** from Texas A&M University, and the winner of the Postdoctoral Award was **Phillip W. Clapp** from the University of North Carolina-Chapel Hill. The slides and recordings of these two presentations are available on the [IVAMSS website's Events page](#).

**We reviewed 39 session** proposals submitted in April 2020 for SOT's 2021 Annual Meeting. Of these, IVAM endorsed 29.

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### **IVAMSS Bylaws Approved by SOT Members**

The IVAMSS officers recently updated the Specialty Section's Bylaws and sent the updated version to members for a vote. More than 2/3 of the voting members approved the changes, so the revised document was sent to the SOT Council for final approval. The revised document is available in [Bylaws section of the IVAMSS website](#).

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### **Treasure's Report By Helena Hogberg**

By the beginning of the year, IVAMSS had a **net asset of \$11,783**, (including \$1,500 in gifts). As of November 2020, we have received **\$7,445 in membership dues**. After all expenses, including **student and postdoctoral awards of \$2,000**, IVAMSS still has a **net asset of \$18,190**. Unfortunately, part of this financial success was due to the lack of SOT meeting expenses 2020 and 2021.

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### **Welcome IVAMSS Officers!**

The election results for the 2021 IVAMSS Officer Elections are in and we are proud to welcome two new IVAMSS officers. **Kristie M. Sullivan** will be joining the IVAMSS Leadership team as **Vice President-Elect** and **Mercedes Salvador-Silva** will be joining as **Councilor**. Congratulations to the new officers!

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### **ATTENTION: Postdocs and Graduate Students**

IVAMSS leadership is planning on hosting a mentoring event open to **postdoctoral researchers** and **graduate students**. Like previous events hosted during the SOT annual meeting, this event will connect leaders working in *in vitro* and alternative methods from industry, academia, contract-research organizations and government with young scientists. If you're interested in hearing about the different career opportunities in the IVAM field, this event may be of interest to you. Currently, the event is planned for **June of 2021**. More details to come, stay tuned!

## SOT Annual Meeting

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### **2021 SOT Annual Meeting and ToxExpo: March 12-26, 2021**

The SOT Annual Meeting and ToxExpo will be held virtually. Still need to register? Register online by this [registration link](#). Below you can find a curated list of talks, posters, workshops and activities that may be of interest to IVAMSS members. You may find the [full meeting program online](#).

Program legend: **Continuing Education**, **Symposium/Platform Session**, **Workshop/Roundtable Session**, **Poster Session**, **Student/Postdoc Interest**

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### **IVAMSS Reception**

**Virtual Event:** IVAM Reception: 8:30 – 9:30 AM ET on March 17, 2021

This event will be held on Zoom. There will be a Breakout Room open from 8:00 – 8:30 AM and 9:30 – 9:45 AM ET.

Missing colleagues you would normally interact with at SOT? Please consider joining us in the Breakout Room before or after the IVAM Reception!

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### **IVAMSS Relevant Activities at the 2021 SOT Annual Meeting**

NICEATM/ICCVAM activities at SOT: <https://ntp.niehs.nih.gov/go/niceatm-sot21>.

- **Friday, March 12**
  - 11:00 AM to 2:45 PM
    - Continuing Education Course (CE02) – “Advances in Single Cell Genomic Analyses for Toxicological Testing”
    - Continuing Education Course (CE03) – “Applications of *In Vitro* and *In Silico* New Approach Methodologies for Predictive and Mechanistic Thyroid Toxicity Testing”
- **Monday, March 15**
  - 11:15 AM to 2:00 PM
    - Symposium Session – “Industrial Applications of Artificial Intelligence in Toxicology”
    - Workshop Session – A Future Framework for Application of *In Vitro* Metabolism in QIVIVE Models to Inform Risk Assessment”
    - Workshop Session – “Standardization of *In Vitro* Inhalation Exposure for Regulatory Acceptance”
- **Tuesday, March 16**
  - 11:15 AM to 2:00 PM
    - Symposium Session – “Pairing Adverse Outcome Pathway Discovery with Advances in Gene Editing to Solve Toxicity Mechanisms”
    - Workshop Session – “New Approach Methodologies for Exposure: Advancing Chemical Risk Assessment”
- **Wednesday, March 17**
  - 11:15 AM to 1:00 PM
    - **Poster Session** – “Liver: *In Vitro*”
  - 11:30 AM to 2:15 PM
    - **Symposium Session** – “Mind the Gap: Finding Practical Ways to Fast-Track the Future of Animal-Free Toxicology Testing”
  - 1:00 PM to 2:45 PM
    - **Poster Session** – “Nanotoxicology: *In Vitro*”
- **Thursday, March 18**
  - 11:15 AM to 2:00 PM
    - **Workshop Session** – “Navigating Your Health and Wellness through Graduate School and Early Careers”
    - Workshop Session – “New Approach Methods for Cancer Risk Assessment”
  - 2:45 PM to 4:15 PM
    - Roundtable Session – “The Future of Uncertainty Factors with *In Vitro* Studies Using Human Cells”

- **Friday, March 19**
  - 11:00 AM to 2:45 PM
    - Continuing Education Course (CE08) – “Guidelines for Developing and Implementing Organ-on-a-Chip/Micro-physiological Systems for Toxicity Evaluation of Drug Candidates in Drug Development”
    - Continuing Education Course (CE10) – “Rapid Chemical Assessment Using Open Computational Methods”
- **Monday, March 22**
  - 11:15 AM to 2:00 PM
    - Symposium Session – “Applications of Novel High-Throughput Approaches for Mechanism-Based Chemical Safety Assessment”
    - Workshop Session – “New Approaches for the Identification and Evaluation of Chemical Respiratory Sensitizers”
  - 11:15 AM to 1:00 PM
    - Poster Session – “Biological Modeling”
  - 1:00 PM to 2:45 PM
    - Poster Session – “Bioinformatics”
    - Poster Session – “Computation Toxicology I”
- **Tuesday, March 23**
  - 11:15 AM to 2:00 PM
    - Symposium Session – “Opportunities for Human-Induced Pluripotent Stem Cell-Derived Neurons in *In Vitro* Neurotoxicity Safety Testing”
  - 1:00 PM to 2:45 PM
    - Poster Session – Computational Toxicology II
  - 2:45 PM 4:15 PM
    - Platform Session – “Biological Models for *In Vitro-In Vivo*” Extrapolation
- **Wednesday, March 24**
  - 11:45 AM to 2:30 PM
    - Symposium Session – “Application of Computational Genomic Approaches to Address Toxicity Mechanisms and Prediction”
    - Workshop Session – “Applicability Domains and Future of Nonanimal Test for Skin Sensitization”
- **Thursday, March 25**
  - 11:30 AM to 2:15 PM
    - Workshop Session – “Regulatory Learnings from the EU Flagship Nonanimal Toxicology Project, EU-ToxRisk”
- **Friday, March 26**
  - 11:00 AM to 2:45 PM
    - Continuing Education Course (CE11) – “Establishing Confidence in Organ-on-a-Chip Systems for Toxicity Testing: Lung-on-a-Chip as an Example”
    - Continuing Education Course (CE14) – “Understanding Tox21/ToxCast High-Throughput Screening Data and Applications to Modeling”

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## IVAM Research

### Research Highlights

Check out a special issue of *Chemical Research in Toxicology* on Computational Toxicology, co-edited by IVAMSS member Dr. Nicole Kleinstreuer. Find the full issue here: <https://pubs.acs.org/toc/crtoec/34/2>

Jong D, Wim H, Carraway JW, Liu C, Fan C, Liu J, Turley AP, Rollins TS, Coleman KP. **The Suitability of Reconstructed Human Epidermis Models for Medical Device Irritation Assessment: A Comparison of In Vitro and In Vivo Testing Results.** *Toxicology in Vitro*. 69: 104995. <https://doi.org/10.1016/j.tiv.2020.104995>

Reardon AJF, Rowan-Carroll A, Ferguson SS, Leingartner K, Gagne, R, Kuo B, Williams A, Lorusso L, Bourdon-Lacombe JA, Carrier R, Moffat I, Yauk CL, Atlas E. **High-throughput Transcriptomics and Benchmark Concentration Modeling for Potency Ranking of Per- and Polyfluoralkyl Substances (PFAS) in Exposed Human Liver Cell Spheroids.** *bioRxiv*. 2020.10.20.347328; doi: <https://doi.org/10.1101/2020.10.20.347328>

Nyffeler J, Willis C, Lougee R, Richard A, Paul-Friedman K, Harrill JA. **Bioactivity Screening of Environmental Chemicals Using Imaging-Based High-Throughput Phenotypic Profiling.** *Toxicology and Applied Pharmacology* 389: 114876. <https://doi.org/10.1016/j.taap.2019.114876>

Zhao L, Russo DP, Wang W, Aleksunes LM, Zhu H. **Mechanism-Driven Read-Across of Chemical Hepatotoxins Based on chemical Structures and Biological Data.** *Toxicological Sciences*. 174(2):178-188; <https://doi:10.1093/toxsci/kfaa005>

Richard AM, Huang R, Waidyanatha S, Shinn P, Collins BJ, Thillainadarajah I, Grulke CM, Williams AJ, Lougee RR, Judson RS, Houck KA, Shobair, M, Yang C, Rathman JF, Yasgar A, Fitzpatrick SC, Simeonov A, Thomas RS, Crofton KM, Paules RS, Bucher JR, Austin CP, Kavlock RJ, Tice, RR **The Tox21 10K Compound Library: Collaborative Chemistry Advancing Toxicology.** *Chemical Research in Toxicology*, <https://doi.org/10.1021/acs.chemrestox.0c00264>

Groff K, Allen D, Casey W Clippinger A. **Increasing the use of animal-free recombinant antibodies.** ALTEX - Alternatives to animal experimentation, 37(2), pp. 309-311. <https://doi: 10.14573/altex.2001071>

Avila, AM, Bebenek I, Bonzo JA, Bourcier T, Davis-Bruno KL, Carlson DB, Dubinion J, et al. **An FDA/CDER Perspective on Nonclinical Testing Strategies: Classical Toxicology Approaches and New Approach Methodologies (NAMs).** *Regulatory Toxicology and Pharmacology* 114 (July 1, 2020): 104662. <https://doi.org/10.1016/j.yrph.2020.104662>

Judson R, Houck K, Friedman KP, Brown J, Browne P, Johnston PA, Close DA, Mansouri K, Kleinstreuer N. **Selecting a Minimal Set of Androgen Receptor Assays for Screening Chemicals.** *Regulatory Toxicology and Pharmacology* 117 (November 1, 2020): 104764. <https://doi.org/10.1016/j.yrph.2020.104764>

Pellevoisin C, Cottrez F, Johansson J, Pedersen E, Coleman K, Groux H. **Pre-Validation of SENS-IS Assay for *in Vitro* Skin Sensitization of Medical Devices.** *Toxicology in Vitro*. (March 2021): 105068. <https://doi.org/10.1016/j.tiv.2020.105068>

## Upcoming and Past Webinars

- **IVAMSS Webinar:** “Big Data and Toxicology – The Future is Now”

This past January **Dr. Thomas Hartung** (Center for Alternative to Animal Testing, Johns Hopkins University) and **Dr. Thomas Luechtefeld** (Insilica, LLC) join the IVAMSS Webinar to talk about applications of big data in toxicology. A link here to view the webinar recording is available on the [IVAM events webpage](#).

- **IVAMSS Webinar:** “2020 IVAM Award Winners”

The **IVAMSS 2020 Award Winners** joined the IVAMSS seminar series this past Jan to present their award-winning research. **Dr. Phillip Clapp** (University of North Carolina Chapel Hill) presented his IVAM research project titled, “*An Inexpensive Open-Source In Vitro Exposure System for Uniform Sedimentation of Liquid Aerosols Generated by New and Emerging Tobacco Products*”. **Sarah Burnett** (Texas A&M) presented her work “*An In Vitro Human Population Model for Screening Environmental Chemicals for the Cardiotoxicity Hazard*”. A link here to view the webinar recording is available on the [IVAM events webpage](#).

- **IVAMSS Webinar:** “State of the Science: QSAR Modeling of Skin Sensitization”

Interested in QSAR and its application to predicting **skin sensitization**? The IVAMSS is planning for a webinar in **May 2021**, so monitor the IVAMSS website for details to be released.

## Expert On...Skin Sensitization



**Nicole C. Kleinstreuer**, PhD, is Acting Director of the NTP Interagency Center for the Evaluation of Alternative Toxicological Methods (NICEATM). Dr. Kleinstreuer received her PhD in bioengineering from the University of Canterbury in Christchurch, New Zealand, and BS degree in mathematics and biomedical engineering from the University of North Carolina at Chapel Hill.

### ***In Vitro Methods and Defined Approaches for Skin Sensitization: Scientific and Regulatory Progress***

By **Dr. Nicole Kleinstreuer**

**I**N 2013, THE Organization for Economic Cooperation and Development (OECD) published an adverse outcome pathway (AOP) for skin sensitization linking molecular initiating events and cellular and tissue effects in the sensitization process. Since then, several *in vitro* (i.e., cell-based) and *in chemico* (i.e., cell-free) testing methods for assessment of dermal hypersensitivity mapped to key events in the AOP have been validated in international interlaboratory ring-trials, and combinations of

these methods (so-called “defined approaches” or DAs) were submitted to the OECD as case studies. Initial work performed in collaboration with the Cosmetics Europe industry consortium demonstrated that the DAs provide superior performance to the existing animal tests when compared to human data. Based on this work, the US

EPA released a draft science policy in 2018 announcing the acceptance of multiple skin sensitization DAs as replacements for laboratory animal testing. Over the last three years, tremendous efforts have been put forth under an OECD project led by the US, Canada, and the EU to curate high-quality reference datasets

of unprecedented size and to develop a novel internationally harmonized DA guideline, the first phase of which covers DAs for hazard and potency category prediction. Other

DAs for future consideration provide point of departure estimates that can be used for quantitative risk assessment. To further investigate the applicability of these approaches across a diverse chemical landscape, the National Toxicology Program Interagency Center for the Evaluation of Alternative Toxicological Methods (NICEATM) solicited

chemical nominations for which there were existing *in vivo* data but only limited *in vitro* evaluation from US federal agencies that belong to the Interagency Coordinating Committee on Validation of Alternative Methods. Just under 200 substances, including pesticide formulations, excipients, and industrial agents, were nominated by partner agencies and have been tested to date in the *in vitro* methods, and analysis of the data is ongoing. A subset of this data and analysis provided by NICEATM has already been used by the US EPA in their 2020 “*Draft Human Health and Ecological Risk Assessments for Several Pesticides for Several Isothiazolinones*”. This is the first use of such information in regulatory risk assessment and marks a major milestone in the use of alternative methods. Overall, defined approaches have been demonstrated to be more reliable and human relevant than the commonly employed *in vivo* test methods for skin sensitization, and substantial progress has been made toward regulatory acceptance in the US and internationally.

**“While no individual *in vitro* test can recapitulate the hypersensitivity response in its entirety, it is clear from these analyses that integrated strategies using varying combinations of *in vitro*, *in chemico*, and/or *in silico* methods could be highly accurate in identifying potential skin sensitizers.”**

## Member Spotlight

### 2020 IVAM Award Winners



Dr. Phillip W. Clapp (left) and Sarah D. Burnett (right) were the 2020 Postdoctoral and Graduate Student Award Winners

**M**UCH TO THE DISMAY of tens of thousands of toxicology researchers, the 2020 Society of Toxicology annual meeting and ToxExpo was cancelled due to the COVID19 pandemic. However, just as remote work shifted to the norm for many scientists, so did IVAMSS. This past year, the annual IVAMSS business meeting was hosted virtually with IVAMSS research at the forefront – 2020 IVAMSS award winners Dr. Phillip W. Clapp and Sarah D. Burnett each presented talks on their award-winning projects.

Electronic cigarettes and other forms of new and emerging tobacco products (NETPs) are becoming increasingly popular, necessitating a need to evaluate their physiological and biological effects. Typically, these effects are evaluated via multi-well *in vitro* aerosol exposure systems which rely on electrostatic manipulation of diluted aerosols to achieve the appropriate particle deposition at the cell culture surface. However, reported particle sizes of NTEP emissions suggest

this method may not produce adequate depositions necessary for accurate toxicity testing. In addition, these systems are often proprietary and can be prohibitively expensive. Dr. Phillip W. Clapp, a postdoctoral researcher at the Center for Environmental Medicine, Asthma, and Lung Biology in the University of North Carolina Chapel Hill has developed an effective and inexpensive multi-well exposure system for *in vitro* toxicity testing of NETP aerosols. Dr. Ilona Jaspers, also of University of North Carolina, served as advisor on the project. The seminar about the project, titled “*An Inexpensive Open-Source In Vitro Exposure System for Uniform Sedimentation of Liquid Aerosols Generated by New and Emerging Tobacco Products*” can be found on [the IVAMSS events website](#).

While adverse cardiovascular events are routinely monitored for pharmaceuticals throughout drug development, testing industrial or environmental chemicals for potential cardiotoxicity is currently not part of the standard regulatory

requirements. In addition, the risk these chemicals pose to different individuals is confounded by genetic variability. Thus, the relative cardio-toxicity risk of thousands of environmental chemicals is uncharacterized. Sarah D. Burnett, a graduate student from Texas A&M in the lab of Dr. Ivan Rusyn, is aiming to reduce this number using an *in vitro* population model by characterizing >1,000 chemicals in induced pluripotent stem cell (iPSC)-derived cardiomyocytes from 5 healthy donors. While the majority of chemicals seem to pose little cardiovascular threat at expected exposure levels, the *in vitro* approach was shown to be a feasible model for high-throughput characterization of chemical cardiotoxicity. The seminar about the project, titled “*An In Vitro Human Population Model for Screening Environmental Chemicals for the Cardiotoxicity Hazard*,” can be found on [the IVAMSS events website](#).

## Postdoc and Grad Corner

*A Message to our fellow IVAMSS Graduate Student and Postdoc Members,*

**F**IRST AND FOREMOST, we welcome you to new a new year and wish you a happy, healthy, and productive 2021! As the whole world hopes to turn a corner on the COVID19 pandemic, this is especially true for graduate students and postdoctoral researchers. The pandemic has disrupted perhaps the most formative time in young scientists' careers. From reduced time in lab, to missed networking opportunities at the SOT annual meeting and other scientific conferences, to the decreased time, support, and encouragement from our fellow graduate students and post-docs garnered only from one-on-one interactions in the lab. We encourage you to join us in focusing on

**"As graduate and postdoc members and scientists of IVAM-SS, there is a lot to look forward to in the future. Interest in *in vitro* and *in silico* alternatives has never been higher."**

the current optimistic news of the vaccine and hope for a return to normalcy soon.

Still, as graduate and post-doc members and scientists of IVAMSS, there is a lot to look forward to in the future. Interest in *in vitro* and *in silico* alternative methods has never been higher. As many of you are aware, in late 2019 [the EPA announced a directive](#) to reduce mammalian study requests and funding by 30% by 2025, with complete elimination by 2035. Just this past summer, the FDA's Center for Drug Evaluation and Research released [their perspective on the future of new approach methodologies in nonclinical testing](#) (Reg. Tox and Pharm., Vol. 114, July 2020, 104662). I hope you share our enthusiasm for a bright future for important research.

While we hope our paths can cross at this year's Virtual SOT Annual Meeting, we remain optimistic we'll be able to gather again at the student/post doc mixer in 2022!



**GET INVOLVED!** Students are essential to the maintenance and growth of the IVAMSS. The entire IVAMSS is committed to creating opportunities for growth in their research careers. Becoming an IVAMSS member allows you access to these opportunities. Most graduate students, or even their mentors, aren't aware that SOT will provide a student's first membership to an SOT section for free! If you have any questions or are interested in getting involved in the specialty section, feel free to contact any of your grad student or postdoctoral representatives!

**Graduate Students:**

Amanda Dhaneshwar

([amanda.dhaneshwar10@my.stjohns.edu](mailto:amanda.dhaneshwar10@my.stjohns.edu))

**Postdocs:**

Megan Culbreth ([culbreth.megan@epa.gov](mailto:culbreth.megan@epa.gov))

Daniel Russo ([danrusso@camden.rutgers.edu](mailto:danrusso@camden.rutgers.edu))

Sincerely,

**Student Representative**

Amanda Dhaneshwar

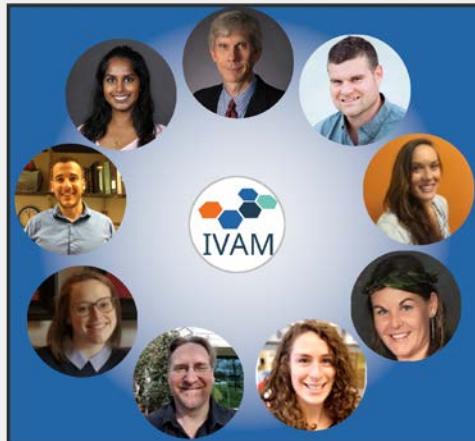
**Postdoctoral Representatives**

Megan Culbreth, Daniel P. Russo

## In Vitro and Alternative Methods Websites

<b>Applied In Vitro Toxicology</b>	<a href="https://home.liebertpub.com/publications/applied-in-vitro-toxicology/626">https://home.liebertpub.com/publications/applied-in-vitro-toxicology/626</a>
<b>Alternatives Research and Development Foundation</b>	<a href="https://www.ardf-online.org">https://www.ardf-online.org</a>
<b>Alternatives to Animal Experimentation (ALTEX)</b>	<a href="https://www.altex.org/index.php/altex">https://www.altex.org/index.php/altex</a>
<b>Alternatives to Laboratory Animals (ATLA)</b>	<a href="https://frame.org.uk/what-we-do/atla-journal/">https://frame.org.uk/what-we-do/atla-journal/</a>
<b>AltTox.org</b>	<a href="http://alttox.org">http://alttox.org</a>
<b>Center for Alternatives to Animal Testing (CAAT)</b>	<a href="https://caat.ihspn.edu">https://caat.ihspn.edu</a>
<b>European Centre for Validation of Alternative Methods (ECVAM)</b>	<a href="https://ec.europa.eu/jrc/en/eurl/ecvam">https://ec.europa.eu/jrc/en/eurl/ecvam</a>
<b>Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM)</b>	<a href="https://ntp.niehs.nih.gov/whatwes-tudy/niceatm/iccvam/index.html">https://ntp.niehs.nih.gov/whatwes-tudy/niceatm/iccvam/index.html</a>
<b>Japanese Center for Validation of Alternative Methods (JaCVAM)</b>	<a href="https://www.jacvam.jp/en/index.html">https://www.jacvam.jp/en/index.html</a>
<b>NTP Interagency Center for the Evaluation of Alternative Toxicological Methods (NICEATM)</b>	<a href="https://ntp.niehs.nih.gov/whatwes-tudy/niceatm/index.html">https://ntp.niehs.nih.gov/whatwes-tudy/niceatm/index.html</a>
<b>Toxicology In Vitro</b>	<a href="https://www.sciencedirect.com/journal/toxicology-in-vitro">https://www.sciencedirect.com/journal/toxicology-in-vitro</a>
<b>Tracking System for Alternative Methods Towards Regulatory Acceptance (TSAR)</b>	<a href="https://tsar.jrc.ec.europa.eu">https://tsar.jrc.ec.europa.eu</a>
<b>Centre for Documentation and Evaluation of Alternative Methods to Animal Experiments (ZEBET)</b>	<a href="https://www.bfr.bund.de/en/department_experimental_toxicology_and_zebet-53864.html">https://www.bfr.bund.de/en/department_experimental_toxicology_and_zebet-53864.html</a>

**Sincere thanks from the 2020-2021 IVAM Officers!**



Clockwise from top: Kelly Coleman (President), Sean Gehen (Vice President), Kathryn Page (Vice President-Elect), Helena Hogberg (Secretary/Treasurer), Samantha Faber (Councilor), Stephen Ferguson (Councilor), Megan Culbreth (Postdoctoral Representative), Daniel Russo (Postdoctoral Representative), and Amanda Dhaneshwar (Student Representative).



Questions? Comments? Feedback? Want to get involved? Please feel free to reach out.

A special thanks to the IVAM Newsletter Team!

Kelly Coleman, Stephen Ferguson, Amanda Dhaneshwar, Megan Culbreth, and Daniel Russo.