



Southern California Regional Chapter OF THE SOCIETY OF TOXICOLOGY

NEWSLETTER



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PRESIDENT'S MESSAGE

A stirring welcome message from this year's SCCSOT regional chapter president, Keri Cannon

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CURRENT SCCSOT OFFICERS

2022-2023 SCCSOT current officers and their pictures!

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REGIONAL MEETING RECAP

On October 6, 2022, SCCSOT regional chapter members gathered for an annual meeting on "**Emerging Topics in Systems Toxicology**".

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SCCSOT SPONSOR SCIENTIFIC SPOTLIGHT

Ken Mullinix of Biomere provides an overview of CSF sampling to support diagnosis of brain tumors.



AWARDS

Congratulations to Thomas Kowal-Safron (UCLA) as winner of the SCCSOT Graduate Student Travel Award with a prize of \$1000 to offset expenses at the SOT Annual Meeting!

UPCOMING EVENTS

Society of Toxicology 62nd National Annual Meeting and ToxExp will be held in Nashville, TN March 19-23, 2023 at the Nashville Music City Center.

SCCSOT/NESOT regional chapter reception at [Martin's Bar-B-Que Joint](#) in Downtown Nashville, TN on March 21st, 2023 from 7-10 pm. Food and 2 drink tickets per person will be provided.

President's Message

It is an honor and privilege to serve as the SCCSOT Regional Chapter President for 2022-2023. I want to start by welcoming the new regional chapter officers, new chapter members, and welcoming back existing members and officers.

The past two years have been challenging both personally and professionally for everyone. However, we were able to continue the work of the chapter through virtual events and networking. As we start to emerge from our pandemic cocoon, the chapter officers and I are eager to build on the momentum of the virtual environments we have been operating in. More excitingly, we are ready to add to the legacy of our chapter by returning to in-person events, including our annual regional chapter meeting in the fall.

As this year progresses, feel free to reach out to me or other chapter officers if you would like to get involved or have ideas for the chapter. I look forward to interacting with chapter members and hearing feedback on what our membership would like to see the chapter engage in.

Keri E. Cannon, PhD, DABT
2022-2023 SCCSOT Regional Chapter President



INTRODUCING OUR REGIONAL SCCSOT 2022-2023 OFFICERS



2022 Annual SCCSOT Regional Chapter Meeting

On October 6, 2022, SCCSOT regional chapter members returned to The Alexandria Point in San Diego for the first time since the pandemic to listen to presentations covering “Emerging Topics in Systems Toxicology”.

After breakfast and a brief welcome message by SCCSOT President, Keri Cannon;

- Dr. Nicole Kleinstreuer (Acting Director of the National Toxicology Program’s Interagency Center for the Evaluation of Alternative Toxicology Methods) kicked off the morning talks with an enlightening presentation on “Augmented Intelligence Along the Computational Toxicology Consortium”.
- Dr. Jason Kwon (Broad Institute of MIT and Harvard) followed with an interesting presentation on “Latent Representation of Gene Function from Functional Genomic Screens Informs Compound Mechanism of Action”.
- Dr. Xia Yang (Integrative Biology and Physiology, UCLA) provided a fascinating talk on “Multi-Tissue Multiomics Systems Biology Approaches to Toxicology”.
- Dr. Mohan Rao (Neurocrine Biosciences) wrapped up the speaker presentations with a captivating talk on “AI/ML Models to Predict DILI Severity Using Chemical Properties and Predicted Off-Target Interactions”.

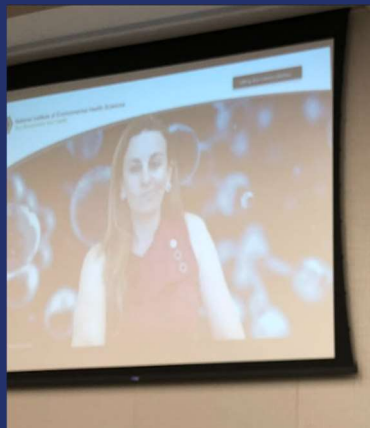
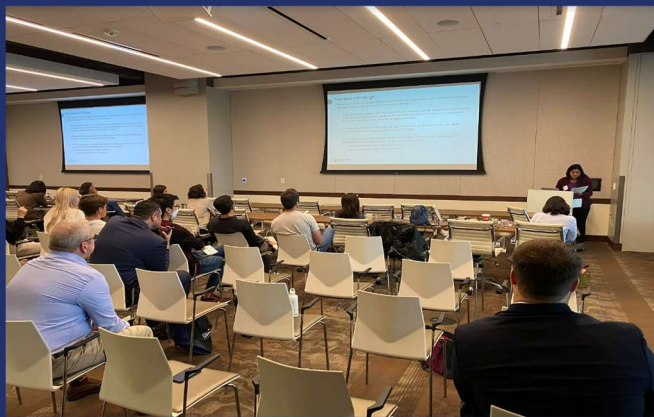
The afternoon presentation session concluded with four short platform presentations by students who did an impressive job presenting their research results.

- Maia Corpuz - USC, presented Alterations of immature Sertoli cell functions by exposure to genistein, acetaminophen and their mixture.
- Thomas Kowal-Safron - UCLA, presented ToxiOmics—A transcriptome-based database and web tool to query and understand associations between environmental toxicants and human disease
- Ashley Schwartz - SDSU, presented Machine learning and high-performance computing for the aggregation of publicly available data sets.
- Svasti Sharma, Neurocrine Biosciences presented Identifying biomarkers for acute neurotoxicity in female Sprague Dawley rat pilocarpine convulsion model

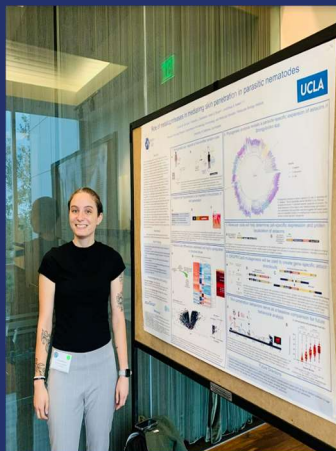
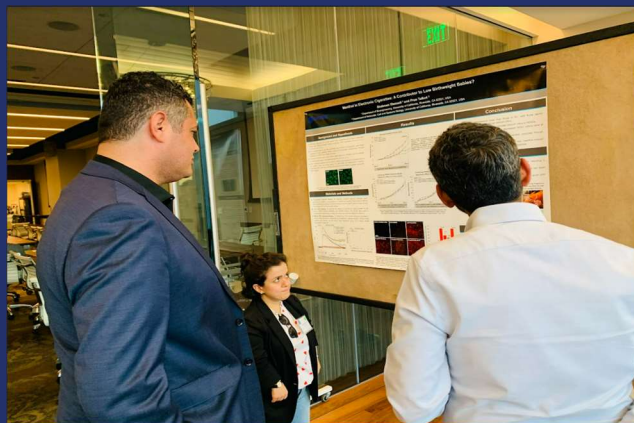
After the presentations, members proceeded to the reception area to view student posters, enjoy refreshments and engage in rousing conversations.

Before the end of meeting, the 2022 Graduate Student Poster Winners were announced:

- 1st place: My Hua, UC Riverside
- 2nd place: Rishaan Kenkre, Neurocrine Biosciences (summer intern)
- 3rd place (tie): Maia Corpuz, USC and Rajat Gupta, UCLA



2022 SCCSOT Regional Chapter Meeting Pictures



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SCCSOT Sponsor Scientific Spotlight

Ken Mullinix, MS

An Overview of CSF Sampling to Support Diagnosis of Brain Tumors

CNS (central nervous system) tumors are primarily located in the brain with some tumors in the spinal cord. CNS tumors can be of various types and are typically named for the cells that are involved - for example, astrocytomas are tumors growing in astrocytes¹. Globally, over 308,000 people are estimated to be diagnosed with a CNS tumor and about 25,000 adults in the US are expected to be diagnosed per year². Additionally, over 4,000 children are diagnosed with a brain tumor and most cases have a poor prognosis². Given the limited therapeutic options for CNS tumors, early and accurate diagnosis of tumors is critical to improve prognosis and survival rates.

Accessing the brain tissue directly is complicated and invasive but the cerebrospinal fluid (CSF) is a viable alternative to assess cancer biomarkers. CSF is a body fluid that circulates over the brain and down the spinal cord. Since it comes into contact with brain tissue and tumors, secreted biomolecules or cancer cells diffuse into the CSF and can be detected using established analytical or cell based assays³. CSF sampling is typically done using a lumbar puncture where a needle is inserted into the spinal cord between the vertebrae. However, cancer cells and secreted biomarkers are not typically found in abundance in the CSF and the analysis may not always be reliable. Therefore, there is a need for more sensitive assays to identify low abundance biomarkers or cancer cells³.

Current assays to identify cancer cells include cytology analysis where CSF samples are analyzed under a microscope, and flow cytometry analysis to identify cancer cell surface markers. A few recent studies have demonstrated that circulating tumor cells (CTCs) in the CSF can be detected using the FDA approved CellSearch[®] system⁴. The CellSearch system was originally approved to detect CTCs in breast, colorectal and prostate cancer⁵, but it has also been successfully used to identify CTCs in breast cancer related brain metastases⁶. It is likely that as more studies with larger patient cohorts are performed, CTC detection in the CSF may become a standard diagnostic tool to identify brain metastases as well as CNS tumors.

CSF samples are rich in different biomarkers that are typically proteins or microRNAs. Changes in protein composition in CSF from normal vs cancer patients can be measured using ELISA or IHC based assays as well as proteomic analysis or mass spectrometry. A study in 2006 used a mass spectrometry-based method to identify elevated levels of carbonic anhydrase as a marker for gliomas⁶. Several studies have compared normal and malignant patient samples and have identified levels of specific markers³. While the results of these studies show promise, it will be important to thoroughly validate tumor type specific biomarkers to meet regulatory requirements for diagnostic testing. MicroRNAs (miRs) are short noncoding RNA fragments that bind to the 3' end of mRNA and inhibit protein translation. There has been an explosion of interest in developing miR based therapies and several miRs have been identified as high potential drugs for specific tumor types. However, as of now, no miR based therapies have been approved by the FDA but the interest in the biopharma industry continues to grow. Identifying miRs in CSF samples is of high interest as diagnostic biomarkers especially since panels of miRs can be used to diagnose specific CNS tumor types. An example of this panel type approach was reported in 2012 where 7 miRs were used to accurately identify glioblastoma and metastatic brain cancer⁷.

Scientific Spotlight (continued)

Despite the active research in this area, there has been a high attrition rate in translating the exciting research findings into the clinic. There is a growing body of literature on the identification of novel biomarkers for specific CNS tumor types, but many of these findings have stalled at the research stage. One of the reasons is that lab to lab differences in sample preparation and analytical methods result in low correlation between studies. Additionally, standard guidelines for CSF collection, sample preparation and analysis are not available so the results are highly dependent on the expertise and experience of each lab. Another reason is that the biomarker analysis requires complex platforms and downstream analysis which is feasible in a research lab setting but may not translate well to clinical labs. In conclusion, CSF samples are a rich source of biomarkers to aid diagnosis of CNS tumors and brain metastases but a lot of process validation and standardization is required to translate research findings to the clinic.

About the author

Ken Mullinix is the U.S. Head of Surgical Services at Biomere. He has a degree in biomimetic design and developed novel orthopaedic instrumentation and surgical techniques during his career as an orthopaedic spine researcher. Among his many affiliations, Ken is currently a reviewer for the Global Spine Journal, and co-authored many published articles, even winning an award for “Best Oral Presentation” at the European Orthopaedic Research Society’s annual meeting.



References:

- 1) <https://www.mayoclinic.org/diseases-conditions/brain-tumor/symptoms-causes/syc-20350084>
- 2) <https://www.cancer.net/cancer-types/brain-tumor/statistics#>
- 3) <https://jcmtjournal.com/article/view/1321>
- 4) <https://academic.oup.com/clinchem/article/68/10/1311/6661459>
- 5) <https://www.cellsearchctc.com/>
- 6) <https://pubmed.ncbi.nlm.nih.gov/17078017/>
- 7) <https://pubmed.ncbi.nlm.nih.gov/22492962/>