Society of Toxicology
Carcinogenesis Specialty Section (CSS)

In this Issue

NEWSLETTER EDITORS

Krishna Allamneni, Jazz Pharmaceuticals, Inc., Palo Alto

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President's Note

Dear SOT CSS members,

This is Robert H. Schiestl, and I am happy to serve as your new president for 2016/2017. My first brief note comes with the summer 2016 newsletter attached and I hope to send you many more.
In this edition of the newsletter, you will find a brief review of the Annual reception for Carcinogenesis Specialty Section, our warm welcome to the new graduate student and post-doc representative and call for your participation in the CSS communications. We introduce you to the CHEAR program and invite you to a summary of novel tools currently available for carcinogenicity testing.

All the best,

Robert

SOT 2016 Annual Meeting Review

The reception for Carcinogenesis Specialty Section was held on March 15th during the SOT Annual Meeting in New Orleans.

We had a good turnout at the SOT CSS reception on the evening of March 15th and hope you had an enjoyable time renewing acquaintances and meeting new colleagues. If you have any suggestions as to how you would like the reception to be structured for the 2017 meeting, do not hesitate to contact us. We want the membership to enjoy the reception.
Please visit the **SOT CSS webpage** to find the Photo gallery
(https://www.toxicology.org/groups/ss/CSS/gallery.asp)

The CSS sincerely thanks Dr. Elaine Faustman and Dr. Joseph Landolph for their service in the CSS Executive team in the past few years. We look forward to your continued support going forward. Thank you once again!!

We look forward to working with you throughout the year. Please do not hesitate to contact us or any members of the executive committee with any suggestions or items of interest you would like to be included in the next newsletter

Welcome our graduate student and postdoc representative

- **Student representative:** Logeswari Ponnusamy
  PhD Candidate & Research Assistant at Texas Tech University

- **Postdoc representative:** Katherine Dunnick
  Postdoctoral Fellow at ScitoVation, LLC

Logeswari

Katherine

Call for volunteers for Communication Committee

CSS Communication Committee is highly active in publishing regular newsletters. We are also responsible for keeping our members updated about the various SOT award and proposal deadlines, new job postings in the SOT Job Bank, upcoming meetings while also providing other interesting feeds. We are on the lookout for motivated and interested volunteers, to join this committee.

Interested volunteers please contact the following members:

Dr. Klaunig: jklauni@indiana.edu AND

Krishna Allamneni: Krishna.allamneni@jazzpharma.com

CHEAR program

The National Institute of Environmental Health Sciences (NIEHS) established CHEAR to advance our understanding of the impact of the environment on children's health and development.

CHEAR provides selected children's health researchers access to laboratory and data analysis services to add or expand environmental exposures as a component of their research. CHEAR is particularly interested in expanding the range of environmental exposures assessed in NIH-funded children's health studies, including:

1. Studies wishing to expand their analysis to include environmental exposure analysis
2. Studies that have collected environmental exposure data but seek more extensive analysis

Exposures measured by CHEAR will cover the breadth of the "exposome," which encompasses all environmental exposures including chemical, physical, and biological stressors, as well as lifestyle and social environments, from conception through adolescence.

For more information, visit **https://chearprogram.org/**

Invited opinion:
Emergence of novel techniques, assays, and tools in carcinogenesis research

By: Sanket Gadhia & Logeswari Ponnusamy
Postdoctoral Fellow, NCATS/NIH

Genotoxic and non-genotoxic mechanisms, independently or in consensus, are capable of initiating, promoting and progressing chemical carcinogenesis. In fact, the potential of xenobiotics to interfere with the physiological processes of transcription, repair, immune response as well as PK-PD parameters further contributes to the extent of toxicity caused. An *ideal* carcinogenicity testing system should be able to test these paradigms single-handedly. Unfortunately, we do not have a single model or a tool that is capable of achieving this, at our disposal. In this section, we summarize novel tools currently available for carcinogenicity testing.

1. **Classification of carcinogens/genotoxicants:**
   a. Novel toxicogenomics-based approach to categorize non-genotoxic carcinogens: Gene expression profiling in primary mouse hepatocytes coupled with mouse embryonic stem cells as a second *in vitro* test system
   b. Comet Chip Technology for the Evaluation of Nanomaterial Mediated Genotoxicity

2. **Carcinogenicity prediction:**
   a. Novel BALB/c-E6E7 cell transformation assay for prediction performance of PAHs carcinogenicity
   b. Use of mechanistically relevant *in vitro* assay data in the identification of relevant biological descriptors and development of Quantitative Biological Activity Relationship (QBAR) models
   c. Nanocytological Field carcinogenesis detection method

3. **Novel *In vitro* models of carcinogenesis**
   a. UVB-induced skin carcinogenesis : UVB-transformed immortalized human epidermal keratinocytes (HaCaT) cells
   b. Innovative 3D *in vitro* bone model with biomimetic nanostructure and composition for Breast Cancer bone metastasis research

c. Novel fluorescence-activated cell sorting (FACS) method for cell line establishment: Technique to overcome the issues related to fibroblast overgrowth and failure of primary tumors *in vitro*

4. **Cancer modelling**
   a. Novel approach of 3D Tissue Modelling and Virtual Pathology to study Ductal Carcinoma *In Situ*
   b. Modelling cancer cell metabolism
   c. Novel dynamic modeling of colorectal cancer signaling-network regions
   d. Modeling carcinogenesis process using CRISPR-Cas9
   e. Retrograde viral vector delivery coupled with *in vivo* CRISPR/Cas9-mediated somatic genome editing to model Pancreatic cancer

5. **Mutation/ Cancer detection**
   a. Microfluidics tool for the capture/ characterization of circulating tumor cells (CTCs)
   b. Automated ALK gene rearrangement testing using fluorescence *in situ* hybridization (FISH)
   c. Nanoparticle Probes

6. **Sequencing/ Epigenetics/ Single cell analysis based emerging tools**
   a. Integrated Patient-Derived Xenograft Platform for lung cancer: It is an integrated preclinical-clinical modeling strategy that uses a large annotated NSG mouse resource of PDX models
   b. Micro-fluidic oscillatory washing–based ChIP sequencing (MOWChIP-seq)
   c. The true single molecule sequencer (tSMS)-heliscope DNA sequencer
   d. Single cell methylome and transcriptome sequencing
   e. Next-generation sequencing coupled with DNA methylation
   f. Single Molecule, Real-Time (SMRT) Sequencing : to evaluate clonal distribution of mutations in genes/genomic regions of interest

7. **Emerging technologies in cancer therapy**
   a. Antibody–Drug Conjugates
   b. Ex vivo culture of CTCs
   c. Cancer nanotheranostics using graphene nanocomposites
   d. Tumor-associated macrophages as a target

8. **DNA repair**

a. Interstrand crosslink (ICL) repair assay : An assay developed using a novel plasmid that contains synthetic ICLs between a CMV promoter region that drives transcription and a luciferase reporter gene, and an SV40 origin of replication and the large T antigen (LgT) gene that enables self-replication in mammalian cells.
b. Comet-FISH to Study Transcription-Coupled Repair
c. Electro chemi-luminescence based assay platform: measures activation of the DNA Damage Response
d. Quantitative Real-Time DNA Repair Analysis Tools

9. <u>Other complimentary tools</u>

a. CRISPR/Cas : moving forward to *in vivo* editing
b. Exposomics