Trainee Corner: Dr. Tamara Tal

Tamara Tal is a postdoctoral fellow in the United States Environmental Protection Agency’s Integrated Systems Toxicology Division where she works with Stephanie Padilla. One of the most challenging and rewarding aspects of Tal’s work is leading a developmental vascular toxicity research team, comprised of developmental biologists and aquatic and computational toxicologists, that is focused on developing higher throughput toxicity assays that detect vascular disruption. The vascular toxicity group’s research objectives are part of EPA’s chemical safety research efforts and embedded within the “Virtual Embryo” project that seeks to develop and evaluate rapid, cost-effective computational and experimental approaches to prioritize chemicals for further testing, particularly in the realm of developmental toxicity.

The group’s research focuses on the vascular system, which is the first functional organ to develop in the mammalian embryo. The vascular system forms by de novo synthesis of blood vessels or by angiogenic sprouting from preexisting blood vessels. Both rely on cellular processes that are governed by a constellation of molecular signaling pathways that may be sensitive to disruption by environmental chemicals.

Vascular toxicity team members leveraged EPA ToxCast™ data generated in hundreds of cell-based and biochemical high throughput assays to computationally identify chemicals predicted to exert toxicity in developing blood vessels. In addition to piloting the team, Tal’s research specifically seeks to generate a model of developmental vasculogenesis and angiogenesis and to test predictions generated by the computational vascular toxicity model in a relevant in vivo experimental system.

To tackle this problem, Tal uses embryonic zebrafish – a transparent vertebrate model of developmental toxicity with a rapid developmental profile and substantial genetic homology with mammals. She deploys transgenic zebrafish that express enhanced green fluorescent protein in blood vessels to both visualize and quantitate blood vessel formation during development.

Transgenic zebrafish are used to visualize different aspects of vessel toxicity following exposure to increasing concentrations of the anti-angiogenic reference compound PTK787.

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**PDA Events at the Annual Meeting**

- **Student/Postdoc Mixer:** Sunday, March 10, 7:30-9:00 PM. (Ticket and Meeting Badge required). The Graduate Student Leadership Committee hosts this opportunity for students and postdoctoral scholars to gather, meet new colleagues, and reestablish relationships in an informal atmosphere at the beginning of the meeting. Tickets are obtained at no cost by registering for this event on the Annual Meeting Registration Form. Complimentary refreshments and a cash bar will be available.

- **Poster Tour for Trainees:** A well-received, new event at the 2012 Annual Meeting, students and postdoctoral scientists will once again have the opportunity to participate in a one-hour guided poster tour with an expert toxicologist. Poster Tours for Trainees will allow trainees to take part in critical evaluation of cutting-edge toxicology methods and research findings, network with an expert, and perhaps even build a long-term mentoring relationship with a senior toxicologist. Options to sign up for specific times and areas of interest are available. Student and postdoc can sign up at: [https://www.surveymonkey.com/s/PQZKH9Y](https://www.surveymonkey.com/s/PQZKH9Y)

- **PDA Luncheon:** Tuesday, March 12, 12:00-1:00 PM. (Ticket required). Amidst scrambling to attend all of the events at the meeting, this will be time for postdocs to kick back and relax! All postdoctoral scholars are invited to a casual luncheon organized by the Postdoctoral Assembly (PDA). The Best Postdoctoral Publication Awards will be given to three postdoctoral scholars and postdoc award recipients from SOT and Regional Chapters, Special Interest Groups and Specialty Sections will be recognized. The PDA Board members will present an overview of accomplishments and future directions for the PDA, and will introduce the new board members for 2013–2014. There will be a drawing for prizes.

- **The Symbiosis of Mentoring: Getting the Most out of the Mentor-Mentee Relationship**
  Tuesday, March 12, 4:30-5:50 PM. Mentoring is a critical element in the career development of all toxicologists, both in terms of making the most of potential mentors and developing effective mentoring skills. Whether through involvement in academia, or helping to develop the expertise of an early-career scientist, most toxicologists will provide mentoring at some point in their career. The mentor role serves to transfer knowledge, give advice and provide support to a trainee or developing scientist, while the mentee is relied upon by the mentor to provide active participation and input into the relationship. Attendees of this session will learn to identify a healthy mentor-mentee relationship and understand the benefits to each member of the collaboration. Mentoring topics discussed in this session will be applicable to scientists at every career stage through highlighting the basics behind a strong, mutually-beneficial mentoring relationship.

- **Role of Systems Biology in Characterizing Risk of Developmental Origins of Disease:**
  **Application of Systems Biology to Toxicology.** Wednesday, March 13, 9:00-11:45 AM. Systems biology is the study of complex interactions of biological components, such as nucleic acids, proteins, chemical reactions, cells, and whole organisms, at multiple levels of organization. The National Research Council recommends implementing the use of systems biology approaches in the risk assessment process. While recent advances have been made to prioritize chemicals for further screening, to better understand mode of action, strengthen weight-of-evidence, and eventually replace traditional *in vivo* animal model data with *in vitro* and *in silico* methods, these data have not been systematically considered in mainstream approaches for risk assessment which also largely focuses on adult populations. The goal of this symposium is to consider emerging knowledge and information from systems biology to inform risk assessment and decision making in the arena of developmental origins of disease.
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Tal has developed and evaluated an *in vivo* quantitative assay of vascular toxicity and shown that that transient inhibition of vessel development is sufficient to trigger persistent structural abnormalities in the vascular system. These data support other work within the vascular toxicity research group showing that transient disruption of angiogenesis during development is linked to decreased survival in juvenile fish.

Ongoing efforts couple the developmental zebrafish vascular toxicity assay with automation for rapid assessment of environmental chemicals. In summary, this work fills a critical need for an *in vivo* platform that can be used to assess predictions generated by computational models of developmental vascular toxicity. *This research synopsis does not necessarily reflect EPA policy.*

PDA Events at the Annual Meeting, Continued from Page 2

- **Regulatory Science and Risk Assessment: Lessons for Early-Career Scientists on What to Expect and how to Pursue This Career Path.**

  Wednesday, March 13, 12:00-1:20 PM. During academic training, postdoctoral and graduate students generally are not provided with opportunities for interacting with toxicologists who are involved in risk assessment and regulatory affairs. The educational training mainly focuses on basic sciences or solving mechanistic problems and thus lacks the practical aspects of risk assessment and regulatory preparation. This concern was discussed at the Education Summit in October 2011, which was organized by the Education Committee of the SOT. Dr. John Doull’s comment that, “toxicology is what we do, but risk assessment is why we do it,” shows the importance for trainees to become aware of both.

“**Toxicology is what we do, but risk assessment is why we do it.”** –Dr. John Doull.
Careers in science seem to be more challenging with no definitive rules to ensure the payoff and move-on in to the next training level. For some trainees it is very difficult to identify the right career path or the right job. During the current economic recession, this lack of direction can become a tough obstacle to reach your career goals. To overcome this obstacle, it is imperative to have a well-designed career development plan or “a game plan” in order to succeed. This issue has triggered several discussions at the national level in terms of generating feasible solutions to promote the best academic and scientific training, including the implementation of a career development plan as part of graduate and postgraduate training.

At the 2012 National Postdoctoral Association annual meeting the American Association for the Advancement of Science (AAAS) gave a preview of the Individual Development Plan (IDP) and myIDP website, which was debuted during the summer 2012. The IDP is a free web-based planning tool designed to help graduate and postgraduate trainees to: (1) identify the long-term career goals that better fit the individual trainee’s unique skills, interest and values, (2) develop a plan to improve the individual trainee’s skills, (3) set specific short-term goals to improve efficiency and productivity and (4) promote and structure productive communication with the mentor(s) about the trainee’s career plans and development.

After this initiative went public, the National Institute of Health (NIH) started the discussion on the importance of an individual career plan for the success of the NIH-funded trainees. NIH will soon require an IDP of all postdoctoral fellows and graduate students who are directly funded by NIH. Some graduate institutions have already implemented a career development plan as part of their graduate and postdoctoral training. This will become a reality for most of the graduate institutions in the US.

Independent of the funding source or institutional requirements, trainees should develop and implement individual career development plans with specific strategies to reach their career goals. It will not only promote a better communication with the advisor/mentor, but will also result in more productivity, satisfaction and publications. Thus, the development and implementation of an individual career development plan will help trainees to achieve greater success that will translate into better job positions and salary.

See us at:
http://myidp.sciencecareers.org/
Election Results

- **Vice Chair**
  - Colleen McLoughlin, CDC/NIOSH

- **Secretary**
  - Karin Streifel, UC Davis School of Veterinary Medicine

- **Treasurer**
  - Kellie Fay, U.S. Environmental Protection Agency

- **Councilors**
  - Katie Paul, U.S. Environmental Protection Agency
  - Rhiannon Hardwick, UNC-Chapel Hill

Meet incoming Board members at the PDA Luncheon!
Tuesday, March 12 at Noon

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**Register for the SOT Job Bank before heading out to San Antonio!**

https://www.toxicology.org/ai/newcrad/

The Society of Toxicology CRAD Job Bank provides employers and candidates who are seeking jobs with the opportunity to establish contacts relating to their specific needs and areas of interest. Registrations will be valid for four months and all registrants may access the system as often as they wish. In addition to this service, the traditional Career Resource and Development Service program will be offered at the 2013 SOT Annual Meeting in San Antonio, Texas, March 10–14, 2013. Please complete the online survey, located on the main menu, as this provides the feedback needed to make improvements or enhancements to the Job Bank service.

You may also be interested in [Mentor Match](#), the SOT Online Mentoring Program for SOT members.
Gordon Research Seminars
Cellular & Molecular Mechanism of Toxicology
August 10-11, 2013, Proctor Academy, Andover, NH

Overview:
An unique forum for graduate students and post-docs organized by the SOT PDA to present and exchange new data and cutting edge ideas.

Application Deadline: July 13, 2013
Students/Postdoc Speakers Deadline: May 2013

Session Topics:
- Modeling the Toxic Response: From molecular alterations and metabolic fingerprints to predictive toxicology
- Genes - Environmental interactions: Environmental exposure and the toxicological mechanisms leading to diseases
- Epigenetic Regulations as a Mechanism for Gene-Environment Interaction: Toxicological Implications
- “How to build effective curriculum vitae for industry, government or academia” & “Finding grants for early career scientists”.

Fellowships for Minority Available: Carl Storm Underrepresented Minority (CSURM) Fellowships
Carl Storm International Diversity (CSID) Fellowships

Gordon Research Conferences
Cellular & Molecular Mechanism of Toxicology
August 11-16, 2013, Proctor Academy, Andover, NH

Apply for both GRS and GRC Cellular and Molecular Mechanism of Toxicology!
Sponsors: GRC and The Society of Toxicology