

## **Collaborative Workshop on Aquatic Models and 21st Century Toxicology**

### **Leveraging small aquarium fishes to advance understanding of environmentally influenced human disorders and diseases**

#### **Workshop Agenda**

##### **May 5, 2014 (8:00 am–5:00 pm)**

- 7:30–8:00 Registration
- 8:00-8:10 Welcome  
Daniel Solomon, Ph.D.  
Dean, College of Sciences  
North Carolina State University  
Raleigh, NC
- 8:10-8:15 Welcome  
Warren Casey, PhD, DABT  
National Toxicology Program (NTP) Interagency Center for the Evaluation of Alternative  
Toxicological Methods (NICEATM)  
National Institute of Environmental Health Sciences (NIEHS),  
Research Triangle Park, NC
- 8:15-8:30 Workshop Overview  
Antonio Planchart, PhD  
Assistant Professor  
Department of Biology  
North Carolina State University  
Raleigh, NC

##### **OPENING SESSION (8:30–9:45am)**

- 8:30-8:35 Introduction to Opening Session
- 8:35-9:00 Dan Villeneuve—Aquatic Models in Regulatory Testing for the U.S. Environmental  
Protection Agency  
Aquatic animal models – Not just for ecotox anymore
- 9:00-9:25 Jyotshna Kanungo—Using Aquatic Vertebrate Models at the U.S. Food and Drug  
Administration  
Zebrafish embryos in drug safety assessment

9:25-9:50 Matthew Winter—European Perspective on the Use of Aquatic Vertebrate Models  
The use of zebrafish for drug safety assessment within the pharmaceutical industry:  
An (ex) insider's perspective

9:50–10:05 **Break**

**SESSION 1 — Cardiovascular Toxicology (10:05am-12:10pm)**

**Session Chairs — Maria Bondesson and Seth Kullman**

10:05-10:10 Introduction to Session 1

10:10-10:40 Maria Bondesson—University of Houston  
Screening for vascular disruptor compounds *in vivo* and *in vitro*

10:40-11:10 Warren Heideman—University of Wisconsin–Madison  
TCDD and AHR in the zebrafish heart

11:10-11:40 Dave Volz—University of South Carolina  
High-content screening assay for identification of chemicals impacting cardiovascular  
function in zebrafish embryos

11:40-12:10 Kenneth Poss—Duke University  
Epicardial cells and heart regeneration

12:10–1:20 **LUNCH**

**SESSION 2 — Developmental Processes in Toxicology and Disease (1:20-2:55pm)**

**Session Chairs — Maria Bondesson and Seth Kullman**

1:20-1:25 Introduction to Session 2

1:25-1:55 Shawn Burgess—U.S. National Institutes of Health  
Development of a rapid *in vivo* chemical screening method for the identification of  
antimetastatic compounds

1:55-2:25 Mark Hahn—Woods Hole Oceanographic Institution  
Diversity as opportunity: Using fish models to understand the role of conditional  
transcription factors in mechanisms of developmental toxicity

2:25-2:55 Nancy Denslow—University of Florida  
Growth of the mosquitofish anal fin in response to androgens and progestins

2:55-3:15      **Break**

**SESSION 3 — Emerging Technologies (3:15-5:20pm)**

**Session Chairs — Keith Cheng and Carolyn Mattingly**

3:15-3:20      Introduction to Session 3

3:20-3:50      Keith Cheng—Penn State College of Medicine

Micron-scale synchrotron x-ray tomography as a tool for pancellular 3-D assessment of cellular and tissue architecture

3:50-4:20      Matthew Harris—Children's Hospital Boston

Evolution's experiments: use of teleost diversity to mine the genetic regulation of development, physiology, and behavior

4:20-4:50      David Reif—North Carolina State University

Rapid identification and characterization of neuromodulator chemicals using an embryonic zebrafish system

4:50-5:20      Rodolphe Barrangou—North Carolina State University

CRISPR-Cas9 systems and genome editing applications

**5:20-5:30      Day 1 Wrap Up**

**Sponsor-Hosted Reception and Poster Session (6:30-8:30pm)**

**May 6, 2014 (8:00 am–4:15 pm)**

**SESSION 4 — Models of Neurobehavior and Neurotoxicology (8:00-10:55am)**

**Session Chairs — Stephanie Padilla and Mamta Behl**

8:00-8:05      Introduction to Session 4

8:05-8:35      Michael Carvan—University of Wisconsin–Milwaukee

Assessing the subtle neurological effects of environmentally relevant methylmercury exposures in zebrafish

8:35-9:05      Marc Ekker—University of Ottawa

Transgenic zebrafish models for the study of dopamine neuron development, loss, and regeneration

9:05-9:35      Stephanie Padilla—U.S. Environmental Protection Agency

Functional assays and alternative species: Using larval zebrafish in developmental neurotoxicity screening

9:35-9:55      **Break**

9:55-10:25      Andrew Rennekamp—Massachusetts General Hospital

Zebrafish as a tool for rapid, *in vivo* detection of small molecule effects on the vertebrate brain

10:25-10:55 Jeff Bronstein—University of California, Los Angeles  
Studying Parkinson's disease-related environmental toxins using zebrafish

**SESSION 5 — Predicting Alterations to the Immune System (10:55am-12:00pm)**

**Session Chairs — Stephanie Padilla and Mamta Behl**

10:55-11:00 Introduction to Session 5

11:00-11:30 Carol Kim—University of Maine  
Gene-environment interactions: Effects of arsenic on the innate immune response

11:30-12:00 Jeff Yoder—North Carolina State University  
Strategies for *in vivo* immunotoxicology assays with zebrafish larvae

12:00-1:05 **LUNCH**

**SESSION 6 — Emerging Issues (1:05-3:10pm)**

**Session Chairs — Robert Tanguay and Jon Hamm**

1:05-1:10 Introduction to Session 6

1:10-1:40 Robert Tanguay—Oregon State University  
*In vivo* behavioral and morphological screening of a 1078 chemical library using zebrafish

1:40-2:10 Jared Goldstone—Woods Hole Oceanographic Institution  
Cytochrome P450 in fish

2:10-2:40 John Rawls—Duke University  
Zebrafish models for investigating environmental regulation of adiposity

2:40-3:10 John Colbourne—The University of Birmingham  
Towards a science-driven solution for cooperative and effective management of chemical risks

3:10-3:30 **Break**

**Workshop Summary Discussion and Closing Remarks (3:30 – 5:00pm)**