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

Session Chairs — Keith Cheng and Carolyn Mattingly

3:15-3:20 Introduction to Session 3
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

3:20-3:50 Keith Cheng—Penn State College of Medicine
Evolution’s experiments: use of teleost diversity to mine the genetic regulation of development, physiology, and behavior

3:50-4:20 Matthew Harris—Children’s Hospital Boston
Rapid identification and characterization of neuromodulator chemicals using an embryonic zebrafish system

4:20-4:50 David Reif—North Carolina State University
CRISPR-Cas9 systems and genome editing applications

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

5:20-5:30 Day 1 Wrap Up

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
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)