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)