Systematic Evaluation of the Application of Zebrafish in Toxicology (SEAZIT): Current and Proposed Activities

Jon Hamm
ILS

Disclaimer: ILS staff provide technical support for NICEATM, but do not represent NIEHS, NTP, or the official positions of any federal agency
Phase 2- In development (FY17)

- Develop protocol for assessing impact of specific identified protocol elements at several test sites
  - Impact of chorion
  - Exposure paradigm: Repeat dosing vs single
  - Use outputs to establish harmonized “approach” for Phase 3
- Development and procurement of a 30-chemical test set
- Ontologies and integration of data streams
  - Implementation of Zebrafish Ontologies for Toxicology Screening
    - Information gathering session planned for April 2017
    - Participants will discuss how to improve zebrafish screening data analysis using ontologies (standardized nomenclature).
  - Webinar series (Feb-Mar 2017) prior to the workshop
Upcoming Webinar Series

Using Informatics to Improve Data Analysis of Chemical Screening Assays Conducted in Zebrafish

- Webinar 1 (February 2): Introduction to Zebrafish Screening
  • This webinar will provide an overview of the SEAZIT program and review the variability found in zebrafish screening data
- Webinar 2 (February 16): Ontologies 101
  • This webinar will define ontologies and describe how they are employed to improve data analysis
- Webinar 3 (March 2): A Review of Relevant Ontologies and Application of Reasoners
  • This webinar will provide information on relevant zebrafish, phenotype, and anatomy ontologies and provide an example of the application of ontologies and reasoners.

• All webinars will begin at 11:30 a.m. EST.
Information Session: Implementation of Zebrafish Ontologies for Toxicological Screening

- Activities include:
  - Small group use case analysis
  - Defining data queries
  - Computing inferences via ontologies: reasoners and specific software

- Goal: Outline a recommendation document that captures best practices in data production, use, tool development, and needs to advance zebrafish applications in toxicology. A working group will be defined to continue working on the recommendations which will be presented at the Best Practices Workshop.
Tentatively planned for fall 2018

- Public forum to discuss continued development and standardization of assays, as well as practices for collecting, analyzing, and reporting of data.

- Objectives:
  - Identify best practices for conducting zebrafish screening assays
  - Define the state of the science for data analysis of zebrafish screening assays and develop guidelines for analyzing and reporting data
  - Define minimum essential endpoints for zebrafish screening assays
  - Develop common terminology for endpoints and effect phenotypes in zebrafish screening assays.

- The workshop will result in a recommendations document for the conduct and reporting of zebrafish screening assays to be published in the peer-reviewed literature.
• Create outreach to individuals with an interest in zebrafish model development

• Sign up for updates through the NICEATM News
  – To register for the NICEATM News email list, go to: https://tools.niehs.nih.gov/webforms/index.cfm/main/formViewer/form_id/361
  – check the box to subscribe to NICEATM News
• Contacts will be provided with information on:
  – Publication of the information group summary report
  – Outcomes of the ontology information session
  – Updates on the Best Practices Workshop
• NICEATM published a Request for Information at the end of 2016


• Requesting information on:
  – Zebrafish model development efforts
  – Data on protocol elements that influence toxicity measurements
  – Toxicokinetic data

Contact
Jon Hamm
hammjt@niehs.nih.gov
• Special thanks to:
  – Tamara Tal (US EPA)
  – Patricia Ceger (ILS)
  – Cathy Sprankle (ILS)
SEAZIT Program Development team

- Auerbach, Scott (BSB)
- Behl, Mamta (TB)
- Casey Warren (NICEATM)
- Foster, Paul (TB)
- Germolec, Dori (TB)
- Masten, Scott (OCNS)
- Maull, Elizabeth (NICEATM)
- McIntyre, Barry (TB)
- Merrick, Alex (BSB)
- Paules, Rick (BSB)
- Pelch, Katie (OHAT)
- Ryan, Kristen (TB)
- Rider, Cynthia (TB)
- Sipes, Nisha (BSB)
- Sutherland, Vickie (TB)
- Tal, Tamara (USEPA)
- Tice, Ray (Special Volunteer)
- Wadyanatha, Suramya (POB)
- Walker, Nigel (NTPO)

Phase 1 team

- Gregory Baker (Battelle)
- Patricia Ceger (ILS)
- Jon Hamm (ILS)
- Milt Hejtmancik (Battelle)
- Elizabeth Maull (BSB)
- Barney Sparrow (Battelle)
- Matt Stout, (POB)
- Nigel Walker (NTPO)

Phase 2 team

- Patricia Ceger (ILS)
- Jon Hamm (ILS)
- Grace Kissling (DIR)
- Elizabeth Maull (NICEATM)
- Alex Merrick (BSB)
- Georgia Roberts (POB)
- Kristen Ryan (TB)
- Keith Shockley (DIR/BSB)
- Nisha Sipes (BSB)
- Tamara Tal (USEPA)
- Suramya Waidyanatha (POB)
- Nigel Walker (NTPO)