



HESI Open Science Challenge: Innovation in Characterizing Drug Exposures During In Vitro Cardiovascular Safety Mechanistic Assay Systems

Background

HESI is a nonprofit organization based in Washington, DC. HESI's mission is to collaboratively identify and help to resolve global health and environmental challenges through the engagement of scientists from academia, government, industry, clinical practice, research institutes, and NGOs. The Cardiac Safety Committee is one of the groups within HESI that focuses to improve public health by reducing unanticipated cardiovascular-related adverse effects from drugs or chemicals and develop innovative approaches to support early detection and prediction as well as improved understanding of cardiovascular toxicology and pathobiology. Learn more about HESI: <https://hesiglobal.org/>

The HESI Cardiac Safety Committee is actively evaluating early mechanistic cell-based assay systems to identify drug induced cardiovascular toxicity. Defining human-relevant modeling systems for these failure modes is the first step towards improving the current paradigm to predict cardiotoxicities. The ideal assay systems to predict failure modes will require high confidence in the biology and in our capabilities for translation and extrapolation to human clinical experience, with a connection to exposure, dose and temporal response.

Because these are human-relevant, mechanistic assays, it is anticipated scalable multi-well plate or automated systems will be used. It will be critical to ensure accurate and precise results obtained from these systems. While there are many aspects to these studies that can and will result in variability issues, HESI has identified two components of particular interest:

1. A rigorously defined protocol for the experimental plate (including for example, plate preparation, cell characterization, culture conditions, and stability) to ensure consistent results.
2. Quantifying and understanding the exposure to test compounds – addressing variable loss in the fluid transfer system, or in the experimental plates/chambers, or effluent.

HESI is seeking ideas, whether theory or tested, to help solve these issues. The submissions should include a proposal that addresses the problem with background and/or evidence for why this might solve the issue and could include additional details such as a strawman protocol and a data analysis plan.

Following this competition, HESI will seek proposals to test the winning idea(s). Submitters will be eligible to apply for the funded proposal and should indicate this interest on the submission.

Submissions should be no more than 4 pages and 3 pages of appendices (for any references or figures.) Submission ideas from all countries/entities are eligible.

All submissions should be emailed to Jennifer Pierson (jpierson@hesiglobal.org) by **23 July 2021**. The Review Committee, listed below, will evaluate each idea and select the winning idea(s) by 31 August 2021.

Review Committee:

Norman Stockbridge, US FDA

William Mattes, US FDA

Tracy Chen, US FDA

Anthony Bahinski, GlaxoSmithKline

Gary Gintant, AbbVie

Sandy Eldridge, NIH-National Cancer Institute

Brian Berridge, NIEHS-National Toxicology Program

Yasunari Kanda, NIHS Japan