

## **Establishing Cell-Based Assays and Implementing 3D Culture Models for Screening and Drug Testing**

### **Course Description**

This course will describe developing standard procedures for handling cultured cells to set up cell-based assays, describe techniques for measuring cell health and the mechanisms leading to cytotoxicity, and provide an overview of recent technological advances in 3D culture technologies that enable automation-compatible drug testing with more predictive and biologically relevant assays. Case studies will be presented which provide examples of using 3D model systems for screening and drug testing.

### **Who Should Attend?**

- Assay development scientists interested in establishing and troubleshooting cell-based assays
- Scientists seeking an overview of methods to confirm health and functionality of cells used in combination with other screening assays
- Industry and academic scientists wishing to get a concise overview about technologies, advantages, cost and application examples of 3D cell-based assays.

### **How You Will Benefit From This Course?**

#### **Participants will receive:**

- An overview of potential pitfalls to consider during design of cell-based assays.
- A description of the advantages and disadvantages of HTS-compatible assays for measuring cell viability & apoptosis as well as multiplexing assays for measuring cell stress pathways.
- A state-of-the-art overview of current methods in the rapidly evolving field of 3D cell-based assays.
- A solid starting point for introducing 3D cell-based assays in your organisation.
- Necessary expertise to use advanced cell culture models for substance testing.
- Copies of presentations and an opportunity to interact with experts in designing and implementing 3D cell-based assays.

## Course Topics:

- Techniques to characterise cell cultures used for high throughput screening assays
- Overview of various cytotoxicity assays, methods for multiplexing as an internal control, and measuring cell stress responses with biochemical and genetic reporter assays
- Overview of 3D cell culture technologies including advantages and disadvantages of scaffold-free and scaffold-based methods
- Validation of existing assay methods applied to 3D culture models
- Implementation of strategies for automation of assays and work flows
- Applying imaging technology to 3D culture models for growth-curve measurements, histology, immunohistochemistry, and high-content analysis
- Applications and cell-based models in oncology: 3D tumor models; co-culture systems; screening of large libraries
- Applications and cell-based models for toxicology including use of primary and stem cells for safety testing such as liver toxicology and inflammation-mediated toxicology

## Instructors:



**Dr. Terry Riss** started the Cell Biology program at Promega Corporation in 1990 and held several R&D and Project Management positions since. Dr. Riss managed development of cell viability, cytotoxicity, apoptosis, and protease assay systems and also lead efforts to identify and promote multiplexing of cell-based assays to determine the mechanism of cell death. Dr. Riss now serves as Senior Product Specialist, Cell Health involved in outreach educational training activities including validating assay systems applied to 3D cell culture models. Dr. Riss regularly participates in NIH study sections reviewing HTS grants and is Associate Editor of the cell health assays section of the Assay Guidance Manual hosted by NIH.



**Dr. Jens M. Kelm**, Chief scientific officer and co-founder of InSphero AG, Zurich, Switzerland (assays and applications in oncology and toxicology) and co-founder of the Swiss competence center for “Tissue Engineering for Drug Development TEDD”: 14 years’ experience in 3D cell culture using a wide variety of cells and technologies, previously director at the Center for Applied Biotechnology and Molecular Medicine at the University of Zurich CABMM.