National Center for Advancing Translational Sciences

Early Translation Branch

The Early Translation Branch aims to uncover new small-molecule probes for disease targets and advance the process of therapeutic development through a collaborative research model. Our early translation teams have expertise in assay biology, high-throughput screening, medicinal chemistry, cheminformatics and data science to complement the disease-area expertise of our external collaborators. Specifically, the Early Translation Branch:

- Develops probe molecules to generate and test therapeutic hypotheses.
- Leverages expertise in assay design, quantitative high-throughput screening and medicinal chemistry.
- Collaborates to create first-in-class small-molecule probes.
- Pursues new platform technologies for target-based and phenotypic screening.
- Develops informatics tools and expertise to leverage new insight from existing data.
- Disseminates tools and technologies — such as the Assay Guidance Manual — to the global health community.
- Educates and trains the next generation of translational scientists.

Visit https://ncats.nih.gov/etb to learn more.

Contact

Matthew Hall, Ph.D.
Director, Early Translation Branch
matthew.hall@nih.gov

3-D Tissue Bioprinting Laboratory

Within the ETB, the 3-D Tissue Bioprinting Laboratory aims to advance the process of discovery and development of new therapeutics by developing in vitro 3-D organotypic cellular assays that better predict the effects of drugs in humans. The laboratory produces 3-D tissue models that mimic the morphological, physiological and pathological characteristics of live human tissues on microplates to enable predictive efficacy and toxicology testing of small molecules or other therapeutics. Specifically, the 3-D Tissue Bioprinting Laboratory:

- Creates a portfolio of normal and disease 3-D organotypic cellular models that have been validated and clinically benchmarked, including spheroids, organoids, biofabricated tissues and tissue-on-chip models.
- Establishes context of use for each 3-D organotypic cellular model developed for drug discovery and development.
- Assesses the applicability of available microphysiological systems for most impact (fit-for-purpose) throughout the different stages in drug discovery and development, including target identification, small-molecule lead identification, small-molecule lead optimization and preclinical development.

- Develops engineering solutions to operationalize the use of bioengineered assay platforms for medium-throughput screening.
- Adapts biological assay technologies to develop quantitative measurements for automated medium-throughput screening with 3-D organotypic cellular models.
- Implements efficacy, toxicology and metabolism screening of small molecules, antibodies, gene therapies and cell-based therapies with 3-D organotypic cellular models.
- Establishes “personalized” complex in vitro assay platforms for advancing research on racial and ethnic health disparities.

Visit https://ncats.nih.gov/bioprinting to learn more.

Contact

Marc Ferrer, Ph.D.
Director, 3-D Tissue Bioprinting Laboratory
ferrerm@mail.nih.gov