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MEETING ABSTRACTS

ORGANOTYPIC AND MICROPHYSIOLOGICAL HUMAN TISSUE MODELS FOR TRANSLATIONAL TOXICOLOGY AND PHARMACOLOGY

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The number of successful drug development projects has been stagnant for decades despite major breakthroughs in chemistry, molecular biology and genomics. Unreliable translatability of preclinical *in vitro* and *in vivo* models has been identified as the cause of most failure. Organotypic and microphysiological culture of primary human cells has emerged as a set of promising tools for preclinical drug development to narrow this translation gap. In this talk I will provide an overview of our recent efforts in developing 3D human tissue cultures and microfluidic models for both efficacy and safety assessments. In addition, the talk will present recent use cases where the use of such organotypic cultures has had direct impacts on market authorizations.

Keywords: 3D human tissue models; translational pharmacology; precision drug development

References

1. Vorrink, S. U., Zhou, Y., Ingelman-Sundberg, M. & Lauschke, V. M. Prediction of Drug-Induced Hepatotoxicity Using Long-Term Stable Primary Hepatic 3D Spheroid Cultures in Chemically Defined Conditions. Toxicol Sci 163, 655–665 (2018).
2. Stebbing, J. & Lauschke, V. M. JAK Inhibitors — More Than Just Glucocorticoids. New Engl J Med 385, 463–465 (2021).
3. Oliva-Vilarnau, N., Vorrink, S. U., Ingelman-Sundberg, M. & Lauschke, V. M. A 3D Cell Culture Model Identifies Wnt/ β-Catenin Mediated Inhibition of p53 as a Critical Step during Human Hepatocyte Regeneration. Advanced Science 7, 2000248 (2020).