MaxWell Biosystems

Modeling Alzheimer's Disease with Brain Organoids: From Molecular Mechanisms to Functional Phenotyping

by Dr. Dasa Bohaciakova

Neurological and psychiatric disorders remain the leading cause of illness and disability worldwide, posing a major challenge to global health. Recent advances in stem cell biology, particularly the use of induced pluripotent stem cell (iPSC)-derived 2D and 3D models, have opened new possibilities for modeling human brain development and disease, along with exploring new therapeutic targets.

In this workshop, we will be joined by Prof. Dr. Dasa Bohaciakova (Masaryk University, Brno), who will present recent findings on the pathogenesis of Alzheimer's disease and avenues for therapy development. Her laboratory uses brain organoids to dissect the roles of PSEN1 and SORLA mutations and the APOE4 variant. These models also make it possible to study how viral infections influence Alzheimer's disease.

We will also highlight how our high-density microelectrode array (HD-MEA) platforms MaxOne and MaxTwo provide powerful, non-invasive tools to probe these complex systems. By enabling detailed analyses of morphology, maturation, connectivity, and functional dynamics, HD-MEAs bring unprecedented insights into disease-specific organoid models, linking molecular mechanisms to functional phenotyping.