

Challenges and future perspectives for 3D cerebral organoids as a model for complex brain disorders

ABSTRACT

The human brain is made up of billions of neurons and glial cells which are interconnected and organized into specific patterns of neural circuitry, and hence is arguably the most sophisticated organ in human, both structurally and functionally. Studying the underlying mechanisms responsible for neurological or neurodegenerative disorders and the developmental basis of complex brain diseases such as autism, schizophrenia, bipolar disorder, Alzheimer's and Parkinson's disease has proven challenging due to practical and ethical limitations on experiments with human material and the limitations of existing biological/animal models. Recently, cerebral organoids have been proposed as a promising and revolutionary model for understanding complex brain disorders and preclinical drug screening.

Keyword: Cerebral organoids; 3D culture; Microfluidic platform; Precision medicine