

## Engineering human brain organoids to study the biology underlying neurodevelopmental disorders

Veronica Krenn<sup>1,2</sup>

*E-mail: veronica.krenn@unimib.it*

<sup>1</sup> Human Technopole Early Career Laboratory of Developmental Neuroimmunobiology  
Department of Biotechnology and Bioscience, University of Milan-Bicocca,

<sup>2</sup> Early Career Fellow, Human Technopole

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**Abstract:** Neurodevelopmental and neuropsychiatric disorders (NNDs) are debilitating conditions that represent a considerable health burden worldwide. Recent progress has implicated an early developmental origin and a major role of fetal neuroinflammation in the pathophysiology of these conditions. Yet, the precise underlying mechanisms remain poorly understood. Given the limited experimental manipulation of primary tissue and the existence of unique features of the human brain that cannot be studied in animal models, human brain organoids recapitulating cell composition and tissue architecture of the human developing brain are increasingly appreciated as tractable human *in vitro* disease platforms. I will present how my laboratory, recently established in the department, uses these emerging technologies to precisely link disease risk factors and genetic variants to neuroimmune processes and to identify neurodevelopmental phenotypes relevant for NNDs. Furthermore, I will describe our current efforts to improve the accuracy of organoid systems and their applicability for disease modelling.