

Advancing Human Organoid Models Toward Physiological Relevance: Challenges and Opportunities

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Human pluripotent stem cells (hPSCs) and organoid technologies have transformed human disease modelling and developmental research, providing unprecedented opportunities to study human biology in vitro currently counting with have the generation of increasingly complex and patient-relevant models.

We will trace the evolution of human brain organoids, from early self-organizing systems to current models designed to better reproduce the cellular diversity, architecture and function and complexity of the human brain from first generation organoids until latest developments in assembloid technology with their advantages and limitations.

These advances position brain organoids as promising New Approach Methodologies (NAMs) for human-relevant disease modelling, drug discovery and toxicology, with the potential to complement or reduce reliance on conventional animal models. However, their adoption as predictive NAMs requires robust benchmarking, reproducibility, defined functional endpoints and validation against human biology.

Laura Batlle Morera Short Biosketch

Dr. Laura Batlle holds a BSc in Biochemistry from the University of Barcelona and a PhD in Stem Cell Biology and Embryology from the University of Edinburgh. She has over 20 years of experience in stem cell research, technology development, and scientific service provision, with a particular focus on modelling human development and disease using advanced in vitro systems.

Since 2015, Dr. Batlle has led the Tissue Engineering Unit (TEU) at the Centre for Genomic Regulation (CRG), where she has established and consolidated a state-of-the-art technology platform providing advanced services in induced pluripotent stem cells (iPSCs), genome editing, stem cell differentiation, and organoid technologies.

Dr. Batlle has secured competitive grants as Principal Investigator, she has co-authored peer-reviewed publications in internationally recognized journals in the fields of stem cell biology and organoid technologies, has overseen the delivery of more than 1,000 specialized scientific services to academic, clinical, and industrial users and founded an chairs CorEUStem, the European Network for Stem Cell Core Facilities. CorEUStem brings together leading core facilities specializing in pluripotent stem cell biology, differentiation, organoids, genome editing, and quality control, with the aim of strengthening coordination and reproducibility across European infrastructures. <https://coreustem.eu>. Today, CorEUStem is widely recognized as the European reference network for stem cell core facilities and associated stakeholders. In recognition of its impact, the network has been awarded the 2026 ISSCR Public Service Award by the International Society for Stem Cell Research (ISSCR), highlighting its success in transforming a fragmented landscape of stem cell infrastructures into a coordinated, sustainable, collaborative, and impactful research ecosystem. <https://www.isscr.org/awards-2026>.

Link to institutional webpage:

<https://www.crg.eu/en/programmes-groups/tissue-engineering-unit-0>
www.coreustem.eu