Introductory Remarks to Symposium 18

From normal brain development to pathology: what role does the environment play?

Cristiana Cruceanu and Simone Mayer, Munich and Tübingen

During prenatal development, neural stem cells divide to produce neurons that assemble into complex neural networks. These processes are determined by an intimate interplay between intrinsic cellular programs and environmental cues. Various inputs from the environment, such as maternal drug use, or exposure to stress or pathogens, during critical periods of brain development could have tremendous cascading effects, leading to diverse pathologies, including mental disorders. This symposium aims to explore how environmental influences affect brain development during critical periods focusing on basic biological mechanisms of brain development, as well as translational and clinical questions.

We will open the symposium with a talk by Scott Yuzwa focusing on how the niche environment in the developing rodent brain instructs neural stem cells to become 'slow-dividing', enabling them to persist into the adult brain. Second, Simone Mayer, who studies the role of neurotransmitters in human cortical development, will highlight a novel single-cell-based approach that enables multimodal analysis. We will next focus on the impact of maternal stress on brain development in cerebral organoid models. Cristiana Cruceanu will explore how cell-type-specific responses to stress shape the developing brain and how these are linked to stress vulnerability and ultimately mental illness later in life. Claudia Buß will then explore how pathogens and the maternal immune system can affect human brain development, leading to behavioral deficits. Additionally, two students will share their latest research. Paola Brivio will highlight the importance of the serotonergic system for plasticity in postnatal brain development in the rodent prefrontal cortex. Rebecca Winter will show how transcranial direct current stimulation affects an animal model of schizophrenia during adolescence.

The synthesis of these diverse perspectives in a field of research that is rapidly gaining traction with new technologies and exciting insights will likely generate a stimulating and enriching discussion for an interdisciplinary neuroscience audience.

Symposium 18

Thursday, March 21, 2019
14:30 - 16:30, Lecture Hall 9

Chairs: Cristiana Cruceanu and Simone Mayer, Munich and Tübingen

14:30 **Opening Remarks**

14:35 Scott Yuzwa, Toronto, Canada
DEVELOPMENTAL EMERGENCE OF ADULT NEURAL STEM CELLS: UNRAVELLING THE INFLUENCE OF THE NICHE (S18-1)

14:55 Paola Brivio, Milan, Italy
ALTERATION OF SEROTONINERGIC SYSTEM ALTERS NEUROPLASTIC MECHANISMS FROM POSTNATAL DEVELOPMENT UNTIL ADULTHOOD (S18-2)

15:10 Simone Mayer, Tübingen
EARLY ACTIVE INTERCELLULAR SIGNALING NETWORKS IN THE DEVELOPING HUMAN BRAIN (S18-3)

15:30 Cristiana Cruceanu, Munich
STRESS HORMONES DURING PREGNANCY AND FETAL BRAIN DEVELOPMENT: WHAT WE CAN LEARN FROM PERINATAL TISSUES AND *IN VITRO* MODELS (S18-4)

15:50 Rebecca Winter, Dresden
PREVENTION OF SCHIZOPHRENIA DEFICITS VIA NON-INVASIVE ADOLESCENT FRONTAL CORTEX STIMULATION IN RATS (S18-5)

16:05 Claudia Buss, Berlin
MATERNAL INFLAMMATION DURING PREGNANCY AND FETAL BRAIN DEVELOPMENT (S18-6)

16:25 **Concluding Remarks**