



Introductory Remarks to Symposium 5

Serotonin and its developmental role in shaping brain plasticity and neuropsychological phenotypes

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Serotonin is a monoamine that acts as a neurotransmitter with essential functions in the adaptation of organisms to their environment in the mammalian brain. Serotonin neurotransmission influences core neuropsychological processes including aversive processing, behavioural inhibition, and social interactions. Moreover, serotonin plays a key role in the development of neuropsychiatric disorders, and the serotonergic system is the most commonly used target of drugs in psychiatry. Even though decreased serotonergic neurotransmission has been classically related to the etiopathogenesis of these disorders, much controversy has arisen once genetically modified models appeared which challenged this serotonin-driven hypothesis.

Recently, a new wave of research revealed that serotonin has powerful neurotrophic actions and plays a key role in neurodevelopmental processes, in addition to being a neurotransmitter. Serotonin was found to control all basic developmental processes from proliferation, differentiation, migration, to the refinement of brain circuits. These serotonin-mediated neurodevelopmental processes interact with pre- and postnatal environmental factors and cause increased vulnerability to neuropsychiatric disorders, affect behaviour and cognitive functions. Whereas the neurodevelopmental role of serotonin is already well documented, the sources of serotonin during development and molecular bases of these processes are still not well studied. The talks in this symposium take profit of murine and rat models in which the serotonin system is modified by targeting different molecules like the serotonin transporter SERT, the transcription factor *Pet1*, or tryptophan hydroxylase (TPH) 1 and 2, the rate-limiting enzymes of serotonin synthesis in the brain and periphery, respectively, to evaluate the contribution of lowered/elevated serotonin levels during development to brain function and the pathogenesis of neuropsychiatric disorders.

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Symposium 5

Wednesday, March 20, 2019
14:30 - 16:30, Lecture Hall 105

Chairs: Natalia Alenina, Piotr Popik and
Francesca Calabrese,
Berlin, Crakow (Poland) and Milan (Italy)

- 14:30 **Opening Remarks**
- 14:35 Natalia Alenina, Berlin
SEROTONIN AND DEVELOPMENT: THE ROLE
OF THE PERIPHERAL SEROTONERGIC SYSTEM
(S5-1)
- 15:00 Sophie Scotto-Lomassese, Paris, France
ROLE OF SEROTONIN IN MATERNAL
BEHAVIOUR (S5-2)
- 15:25 Judith Homberg, Nijmegen, The Netherlands
INCREASED MATERNAL EXTRACELLULAR SERO-
TONIN LEVELS BENEFICIALLY INFLUENCES
OFFSPRING'S ANXIETY- AND ANHEDONIA-
LIKE BEHAVIOUR (S5-3)
- 15:50 Agnieszka Nikiforuk, Crakow, Poland
HIGH AND LOW SEROTONIN: IMPLICATIONS
FOR NEUROPSYCHIATRIC DISORDERS (S5-4)
- 16:15 Franziska E. Müller, Hannover
THE IMPACT OF SEROTONERGIC SIGNALING
IN ASTROCYTES (S5-5)
- 16:25 **Concluding Remarks**

