

Illuminating the brain – genetically encoded sensors to explore neuronal circuitries

Prof. Dr. Olivia Masseck

University of Bremen, Synthetic Biology lab

Talk Abstract

Understanding how neural networks generate complex behaviour is one of the major goals of neuroscience. Neurotransmitters and neuromodulators are crucial for the flow of information between neurons, and understanding their dynamics is key to unravelling their role in behaviour. We have recently developed a new family of genetically encoded serotonin (5-HT) sensors (sDarken) based on the native 5-HT_{1A} receptor and circularly permuted GFP. sDarken 5-HT sensors are bright in the unbound state and decrease their fluorescence upon binding of 5-HT. Sensor variants with different affinities for serotonin have been developed to increase the versatility of imaging serotonin dynamics. Experiments *in vitro* and *in vivo* demonstrated the feasibility of imaging serotonin dynamics with high temporal and spatial resolution. The designed sensors have excellent membrane expression, high specificity and signal-to-noise ratio, detect endogenous serotonin release and are suitable for *in vivo* imaging. Furthermore, a new and improved red-shifted calcium sensor based on cpmScarlet (PinkyCaMP) is presented.

Prof. Dr. Olivia Masseck

The Masseck lab develops new tools to illuminate how neuronal circuits interact and combines optogenetics, electrophysiology, imaging and behavior to decipher the role of neurotransmitters in health and disease. With her work, Olivia Masseck pioneered the development of optogenetic tools to control activity of serotonergic receptors. Moreover, just recently her lab developed a fluorescent sensor to monitor serotonin *in vitro* and *in vivo*.

Thursday, 20th April 2023, 2 p.m. (hybrid)

In-Person:

Building A10 (Lehrgebäude), Seminar Room 1.05

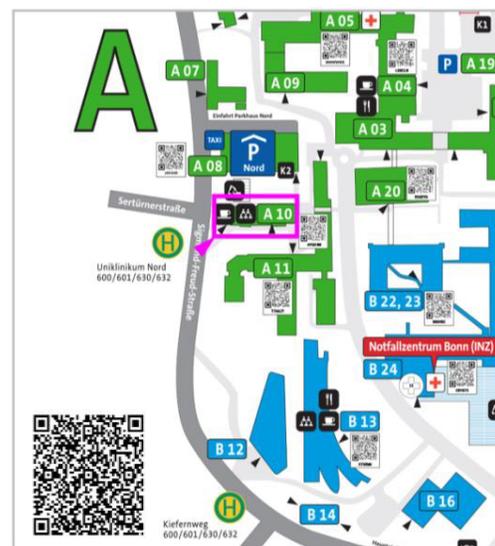
Join in person and enjoy snacks & refreshments

Online:

<https://uni-bonn.zoom.us/j/61340657076?pwd=b05pUk5KRkREZ29vYm1DejNqdTh6dz09>

Meeting-ID: 613 4065 7076

Passcode: 894358



Contact

Prof. Dr. Stefanie Poll, Cellular Neuropathology and Cognition lab
 Institute for Experimental Epileptology and Cognition Research (IEECR)
 University Hospital Bonn, Venusberg-Campus 1, Building C76
stefanie.poll@ukbonn.de