

Invitation to the Keynote Lecture Faculty of Biology

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How does the brain decide which way to turn?

Abstract: The ability to act voluntarily is fundamental to animal behavior. For example, self-directed movements are critical to exploration, particularly in the absence of external sensory signals that could shape a trajectory. However, how neural networks might plan future changes in direction in the absence of salient sensory cues is poorly understood. Here we use volumetric two-photon imaging to map neural activity associated with walking across the entire brain of the fruit fly *Drosophila*, register these signals across animals with micron precision, and reveal that turning is associated with widespread asymmetric activity between brain hemispheres. Strikingly, this asymmetry in interhemispheric dynamics emerges more than 10 seconds before a turn within a specific brain region associated with motor control, the Inferior Posterior Slope (IPS). This early local difference in neural activity predicts the direction of future turns on a trial-by-trial basis, revealing long term motor planning. As the direction of each turn is neither trained, nor guided by external sensory cues, it must be internally determined. We therefore propose that this pre-motor center contains a bistable circuit that stochastically biases a future movement direction.

Monday, 24 June 2024, 2-4 pm

Host: Prof. Dr. Marion Silies

The keynote lecture will be presented at the
Biozentrum 1, HS BZ1, 00.187, Hanns-Dieter-Hüsch-Weg 15, Ground Floor

Please note! Would you like to receive invitations to future lectures? Your registration is required!
Please register for the talks-sympalists at: https://lists.uni-mainz.de/sympa/info/talks_fb10

