



Colloquium

Unraveling Circuits for Movement: Insights into Gait Motor Control and Implications for Treatment for Parkinsonian Gait Disorders

Ole Kiehn

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Host: Maximilian Jösch

Abstract: Movement is the output of almost all brain functions. Among movement, locomotion is one of the most fundamental and universal to animals and humans. Locomotion is organised at many levels of the nervous system, with brainstem circuits acting as the gate between brain areas regulating innate, emotional, or motivational locomotion and the executing spinal motor circuits. To be executed, locomotion requires dynamic initiation and termination and appropriate directionality. This lecture will focus on recent advances that have elucidated the functional organization of brainstem command circuits in mammals needed to perform these roles. The lecture will provide a new framework for how basal ganglia circuits are acting via these brainstem circuits to elicit self-paced locomotion and how brainstem motor circuits may be used to define brain-wide networks involved in high-level behaviors. I will also discuss how locomotor disturbances following e.g. basal ganglia disorders may be alleviated by targeted activation of brainstem and basal ganglia circuits.

Biography: Ole Kiehn is Professor in Integrative Neuroscience at the Department of Neuroscience, University of Copenhagen, and Professor in Neurophysiology at the Department of Neuroscience, Karolinska Institutet. Ole Kiehn earned his medical degree from the University of Copenhagen in and his Doctorate of Science from the same institution. He conducted his postdoctoral work at Cornell University before returning to the University of Copenhagen as a group leader at the Institute of Neurophysiology. In 2001, he was recruited to Karolinska Institutet, where he became a professor in 2004. Since 2017, he has held a position as a professor at the Department of Neuroscience at the University of Copenhagen. Kiehn's published more than 120 papers in journals including Nature, Nature Neuroscience, Cell, PNAS, Science and Neuron among others. His research focuses on understanding the molecular, cellular, and functional organization of motor circuitries in mammals. His work has uncovered spinal circuits in mammals that control the ability to produce and coordinate locomotor movements, as well as brainstem command pathways that regulate the expression of movement in a context-dependent manner. His work links these brainstem circuits to motor circuits in the basal ganglia, and higher brain area. It provides novel insights into the role of brain circuits in the manifestation of motor disorders, like Parkinson's Disease. Kiehn has served or serve on distinguished evaluation committees, including the Nobel Committee in Physiology or Medicine, the Brain

Prize Committee and The Novo Nordisk Prize Committee. He is the currently the President of the Federation of European Neuroscience Societies. His research has been recognized with numerous honors, including the Torsten and Ragnar Söderberg's Professorship, The Novo Nordisk Laureate Program, The Lundbeck Foundation Professorship, Advanced ERC grants, the Schellenberg Prize, the Kirsten and Freddy Johansen Preclinical Prize, and the Brain Prize 2022. He is an elected member of Academia Europaea, EMBO, the Royal Swedish Academy of Science, and The Danish Academy of Sciences and Letters.

Monday, March 9, 2026 11:30am - 12:30pm

Raiffeisen Lecture Hall



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