



NEURO GLOBAL Seminar

Date & Time

Tuesday, July 22, 2025
16:00~18:00

Speaker

Dr. Felix Beinlich

Assistant Professor
Center for Translational Neuromedicine
The University of Copenhagen



Title

**Oxygen imaging of hypoxic pockets in the
mouse cerebral cortex**

Venue

Espace, Katahira Kitamon Commons [A01] 2F, Katahira Campus

片平北門会館[A01] 2階 エスパス 片平キャンパス

【MAP】 https://www.tohoku.ac.jp/map/ja/?f=KH_A01

Format On-site

Registration Please contact NGP Office (neuroglobal@grp.tohoku.ac.jp)

Related websites <https://ctn.ku.dk/employees/?pure=en/persons/641378>

【Neuro Global生・[先進]脳科学セミナーシリーズEx】 【NGP students, [Advanced] brain science seminar series Ex】 1 point
【医学系研究科・医学履修課程】国際交流セミナー【Medical Science Doctoral Course】 International Interchange Seminar 1回分
【生命科学研究科・イノベーションセミナー（留学生）、単位認定セミナー】 【Innovation seminar, Credit-granted seminar】 2 points

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NEURO GLOBAL
Tohoku University



NEURO GLOBAL Seminar

Title

Oxygen imaging of hypoxic pockets in the mouse cerebral cortex

Abstract

Consciousness is lost within seconds upon cessation of cerebral blood flow, as the brain's inability to store oxygen leads to critical disruptions of oxidative phosphorylation within minutes. Despite its importance, our understanding of cortical partial oxygen tension (PO_2) dynamics under physiological conditions remains limited. Current methods assessing brain PO_2 dynamics lack sufficient spatio-temporal resolution. We recently introduced Green enhanced Nano-Lantern (GeNL), as a novel genetically encoded oxygen indicator for PO_2 imaging based on bioluminescence. We demonstrated that the bioluminescence intensity of GeNL in the living mouse brain is oxygen-dependent in a linear manner. Our research revealed spontaneous, spatially distinct "hypoxic pockets" in awake, active mice, linked to the abrogation of local capillary flow. Exercise reduced the burden of hypoxic pockets by 52% compared with rest. Our study provided insight into cortical oxygen dynamics in awake behaving animals and concurrently introduced a valuable tool for exploring the role of oxygen tension in physiological processes and neurological diseases, such as Alzheimer's disease.

Profile

Dr. Felix Beinlich is an Assistant Professor at the Center for Translational Neuromedicine at the University of Copenhagen, Denmark. He received his Ph.D. in 2018 from Heinrich Heine University Düsseldorf, with a specialization in Mathematics and Natural Sciences. His research focuses on cerebral blood flow and oxygen dynamics under both physiological and pathological conditions, as well as the development of fluorescent biosensors for in vivo applications in the rodent brain.