NEURO GLOBAL
Seminar

Speaker

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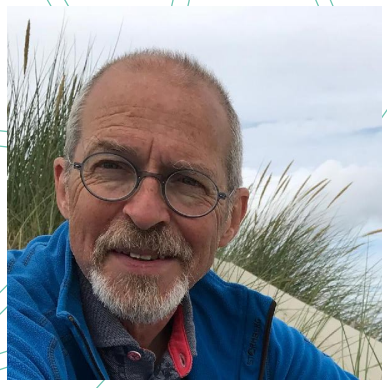

Title

Networks of the parahippocampal-hippocampal memory system in the healthy and diseased brain

Date

Dec 7 (Mon) 17:30-19:00

Registration form:

Refer to the message from NGP office.

Registration Deadline

Mon, Nov 30, 2020

Lab HP

https://www.ntnu.edu/employees/menno.witter

●Neuro Globalプログラム生（Neuro Global Program Students）
【脳科学セミナーシリーズEx】／【先進脳科学セミナーシリーズEx】セミナー 1ポイント
【Brain Science Seminar Series Ex】／【Advanced brain science seminar series Ex】 1 points
●医学系研究科（Graduate School of Medicine）
【医学履修課程】国際交流セミナー
この講演会は医学履修課程「国際交流セミナー（アドバンスド講義科目）」を兼ねています。（1回分の出席とみなします。）
興味のある方はどなたでも参加可能です。
【Medical Science Doctoral Course】 International Interchange Seminar
This lecture will be combined with “International Interchange Seminar (Advanced Lecture course)” for Medical Science Doctoral Course.
(It will be counted as 1 attendance.)
All students are welcome to join the seminar.
●生命科学研究科（Graduate School of Life Sciences）
【単位認定セミナー】
通常通り単位認定セミナーとしてポイントを付与します。
【Credit-granted seminar】
Some points will be granted as usual to the students who will attend this seminar.

東北大学 Neuro Global 国際共同大学院プログラム事務局
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Seminar

Abstract

The parahippocampal-hippocampal network is a crucial component of our conscious memory system, often referred to as the medial temporal lobe memory system. It comprises the hippocampal formation (HF) and the parahippocampal region. The latter comprises the entorhinal cortex as well as the perirhinal and parahippocampal (primates) or postrhinal (rodents) cortex, and the pre-and parasubiculum.

The quest to understand the system as a key player in learning and memory started in the late 1950th and was boosted by the discovery of spatially modulated neurons in the hippocampus in 1971. Subsequently, many spatially modulated neurons were discovered in the parahippocampal region, and research has focused on the pivotal position of the entorhinal cortex and its two subdivisions, the lateral and medial entorhinal cortex.

The current, generally accepted organizational scheme is that the medial entorhinal complex conveys spatial information to HF, the ‘where pathway’, whereas the lateral entorhinal complex conveys information concerning objects, the ‘what pathway’ to HF. In my presentation I aim to brief you on the development of this scheme and show recent connectional data indicating that this concept needs to be revised. I will elaborate on recent findings indicating that the local networks of the lateral and medial entorhinal cortex are remarkably similar, and emphasize the difference in extrinsic connectivity as a major defining feature for the known functional differences. The lateral entorhinal cortex is a high-order multimodal cortex appropriately positioned to integrate representations of the external world with motivational signals, modulated by planning and decision signals originating from amygdala, orbitofrontal, medial prefrontal and insular cortex. In contrast the medial entorhinal cortex seems to provide for information to faithfully map the subjects position in an environment over time.

In my lecture, I will detail some of the groundbreaking findings that led to this alternative functional view and emphasize the potential of multidisciplinary interactions between in vivo and in vitro electrophysiology and neuroanatomy. Adding the power of transgenic approaches combined with pharmacogenetic and optogenetic tools resulted in a grossly increased level of detailed knowledge on the networks and mechanisms involved in learning and memory.

I will finish with a short indication of the relevance of basic detailed knowledge on brain connectivity at the level of identified neuron type, in relation to understanding certain brain diseases inflicting our memory system, such as Alzheimer’s disease.

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