

医学セミナー

“Cortical neurodegeneration and regeneration in a rat stroke model”

演者： Prof. Dr. Gustav Jirikowki

ドイツ Friedrich-Schiller 大学 Jena



解剖学第 II 講座 教授

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筑波大学・ドイツ学術交流会 (DAAD)
パートナーシッププログラム

時間： 15:30 ~ 16:30

場所： 学系棟 2 階 272 室

Jirikowski 教授は視床下部を中心とする神経回路を、様々な標識方法を用いて明らかにしており、Science など主要なジャーナルに多くの論文を發表されています。今回、筑波大学とドイツ学術交流会とのプログラムに基づき来日されます。

要旨： Transient cerebral ischemia and subsequent reperfusion is known to induce irreversible tissue damage with the consequence of more or less pronounced impairments. The underlying cellular and molecular mechanisms however are far from being understood today. Here we employed a well established rat model MCAO (Medial cerebral artery occlusion), which uses a unilateral ligation of the middle cerebral artery for a defined period of time, prior to reperfusion. Animals develop symptoms, comparable to stroke in humans. Brains of such animals were used for histochemical and biochemical evaluation of markers of programmed cell death, (apoptosis) including tissue transglutaminase, DNA fragmentation and presence of cytochrome c in both cerebral hemispheres. Electron microscopy was employed to assess ultrastructure of tissue in the infarcted brain areas. We observed a remarkable functional recovery of MCAO rats within one week. Observations of brain sections revealed however that after 30, 60 and 90min of ischemia increasingly severe tissue damage had occurred not only on the ipsilateral but also on the contralateral hemisphere, indicating anterograde and retrograde degeneration. Proliferation of glial and neuronal cells was observed in the periinfarctal tissue of all experimental rats. It is unlikely that functionally relevant neuronal circuits had developed. We conclude that MCAO induces permanent damage in the affected brain regions, leading to progressing neuronal apoptosis. The observed functional recovery may be due to neuronal plasticity in young rats.

連絡先： 医学医療系 神経内科 詫間 浩 (7926, 3224)