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## Experimental studies

### Poster Session Red

**Chairs:**

**Date: Wednesday 27 May 2009**

**Time: 12:30 - 14:00**

**Room:**

#### 6. 14.1T magnetic resonance spectroscopic evaluation of metabolic changes in the mouse striatum following transient middle cerebral artery occlusion

Magnetic resonance imaging (MRI) and spectroscopy (MRS) allow establishing the anatomical evolution and neurochemical profiles of ischemic lesions. However only limited MRS studies have been reported to-date in mice due to the challenges of MRS in small organs. The aim of the current work was to study the neurochemical and imaging sequelae of ischemic stroke in a mouse model in a horizontal bore 14.1 Tesla system. ICR-CD1 mice were subjected to 30 minute transient middle cerebral artery occlusion. The extent of the lesion was determined by MRI. The neurochemical profile consisting of the concentrations of 22 metabolites was measured longitudinally following the recovery from ischemia at 3, 8 and 24h in the striatum. Our model produced very reproducible striatal lesions which began to appear on T2-weighted images 8h after ischemia. At 24h, they were well established and their size correlated with lesions measured by histology. Profound changes could be observed in the neurochemical profiles of the core of the striatal lesions as early as 3h post-ischemia, in particular, we observed elevated lactate levels, decreases in the putative neuronal marker N-acetyl-aspartate and in glutamate, and a transient two-fold glutamine increase, likely linked to excitotoxic release of glutamate and conversion to glutamine. With further ischemia evolution, other changes appeared at later time-points, mainly decreases of metabolites, consistent with disruption of cellular function. It is interesting to note that glutamine tended to return to basal levels at 24h. We conclude that early changes in markers of energy metabolism, glutamate excitotoxicity and neuronal viability can be detected with high precision non-invasively in mice following stroke. Such investigations should lead to a better understanding and insight into the sequential early changes in the brain parenchyma after ischemia, which could be used e.g. for identifying new targets for neuroprotection.

Graphic: \_

Table: \_

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