receptors. The accumulation of CTH also suspended the MG132 insensitive (proteasome inhibitor), but PMSF (serine-type endopeptidase inhibitor) sensitive proteolytic degradation of the p54/Rpn10, Dsk2 and Rad23 during the early larval stages.

Interestingly, CTH carrying three active UIM sequences extra-proteasomally traps the Dsk2 protein, hindering its interaction with the 26S proteasome. Our *in vitro* and *in vivo* studies revealed that in *Drosophila* UIM motifs of p54 can selectively bound the N-terminal UBL (ubiquitin like) domain of Dsk2. We suppose that contrary to the yeast model in which Rpn1 and Rpn2 scaffold subunits of the RC anchor Dsk2, Rad23 and Ddi1, in *Drosophila* the major polyubiquitin receptor Dsk2 (Lipinszki et. al. manuscript in preparation) docs to the C-terminally localized UIMs of the p54. Nevertheless, is has been demonstrated that p54 is a shuttling subunit of the proteasome (Kiss et. al., Szabó et. al.). It is conceivable that under regulation (e.g. ubiquitilation) p54 dissociates from the proteasome, and forms a heteromer with the Dsk2/substrate dimer, which is followed by the reassociation of the whole complex to the proteasome for degradation of the substrate protein.

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Supervisor: Andor Udvardy
e-mail: lzoltan@brc.hu

Neuroprotection in ischemic adult rat brain

Máté Marosi

Department of Physiology, Anatomy and Neuroscience, University of Szeged, Szeged, Hungary

Transient global ischemia elicits selective, delayed neuronal death. If the ischemia is short, neuronal damage occurs only in vulnerable areas (Pulsinelli et al. 1985). The pyramidal neurons in the hippocampal CA1 region are very vulnerable. Global ischemia impairs memory and learning functions. It is widely accepted that activation of the excitatory amino acid receptors plays an important role in neuronal death in stroke (Choi 1988). It has recently been reported that glutamate-induced excitotoxicity and a cellular calcium overload are among the key factors of cell death in brain ischemia, especially in the gray matter. By definition, excitotoxicity is a result of overexcitation of the glutamate receptors. In turn, neuroprotective strategies have utilized antagonists of the glutamate receptors to prevent excitotoxic neuronal loss.

The neuroprotective effect of L-kynurenine sulfate (KYN) was studied. KYN pretreatment decreased the number of injured pyramidal cells in the CA1 region of the hippocampus in the four-vessel occlusion (4VO)-induced ischemic adult rat brain. KYN post-treatment proved to be much less effective. In parallel with the histology, a protective effect of KYN on the functioning of the CA1 region was observed: long-term potentiation (LTP) was abolished in the 4VO animals, but its level and duration were restored by pretreatment with KYN. It is concluded that the administration of KYN elevates the KYNA concentration in the brain to neuroprotective levels (Sas et al. 2008).

The excess Glu which causes neuronal death via excitotoxicity, is normally controlled by members of a family of Na^+-dependent Glu transporters. By pumping Glu, they guarantee the presence of Glu in brain fluids at levels at which its exerts neither excitotoxic nor unsolicited excitatory effects. Glu transporters located on the brain vasculature may also play an important role in controlling extracellular Glu levels via a brain-to-blood Glu efflux. The scavenging of blood Glu increases the driving force for the brain-to-blood Glu efflux and causes a decrease of the excess Glu present in the brain. (Teichberg et al. 2008)

In the second series of experiments we evaluated the effects of the blood glutamate scavenger oxaloacetate on the impaired LTP observed in the rat 2-vessel occlusion ischemia model. Transient incomplete forebrain ischaemia was produced 3 days before LTP induction. Although the short transient brain ischaemia did not induce histologically identifiable injuries, it resulted in an impaired LTP function in the hippocampal CA1 region without damaging the basal synaptic transmission between the Schaffer collaterals and the pyramidal neurons. This impairment could be fended off in a dose-dependent manner by the i.v. administration of oxaloacetate immediately after the transient hypoperfusion. These results suggest that oxaloacetate-mediated blood and brain glutamate scavenging contributes to the restoration of the LTP after its impairment by brain ischaemia. (Marosi et al. 2009)

Our results suggest that both agents have potential clinical usefulness for the prevention of neuronal loss in stroke conditions.

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Supervisor: Tamás Farkas
E-mail: marosi.mate@gmail.com