

P4.24.

Comparison of MMP-9 activation in different absence epileptic rat models: brain zymography study

Szodorai, E.^{1*}; Takács, E.¹; Kovács, Z.²; Kékesi, A. K.^{1,3}; Czurkó, A.¹; Juhász, G.¹

1: Laboratory of Proteomics, Institute of Biology, Eötvös Lorand University, Budapest, Hungary

2: Department of Zoology, University of West Hungary, Savaria Campus, Szombathely, Hungary

3: Department of Physiology and Neurobiology, Eötvös Lorand University, Budapest, Hungary

There are two widely used genetic models of absence epilepsy: the GAERS strain is a selected strain from Wistars and the WAG/Rij strain is a selected single rat pair origin strain. The question is as follows: Are the two strains identical in terms of molecular mechanisms of seizure genesis? MMP-9 is an inducible metalloproteinase locating in the synapses and its role is the molecular tuning of synaptic transmission via protein degradation. In the present study we compared parietal and prefrontal cortices and the thalamus as well as hippocampus of 4 NEC, 4 GAERS, 4 WAG/Rij rats applying brain tissue zymography that showed the changes of pro-MMP-9, active-MMP-9 and MMP-2. We did not observed any changes in MMP-2 indicating the accuracy of protein quantification. In WAG/Rij rats we found higher level of active-MMP-9 in the cortical structures and also elevated pro-MMP-9 level in the thalamus and the cortex. Since the number of seizures is lower in WAG/Rij rats than in GAERS, we suggest that the elevated MMP activation in the cortical genesis sites of seizures could modulate the seizure genesis in WAG/Rij rats but not in GAERS. Our suggestion is supported by the fact that inhibiting MMP-9 activation by doxycycline in WAG/Rij rats increases the number of seizures. Thus we claim that significant differences can be in the molecular mechanisms of seizure genesis of the two strains developed by different selection methods.