Anne Maren Dahlhaus
Dr. med.

Synaptic input of rat spinal lamina I projection and unidentified neurones *in vitro*

Geboren am 14. Dezember 1979 in Essen
(Staats-)Examen am 05. Dezember 2007 an der Universität Heidelberg

Promotionsfach: Anatomie und Zellbiologie
Doktorvater: Herr Prof. Dr. med. S. Mense

Spino-parabrachial and spino-PAG lamina I neurones selectively exhibit synaptic LTP, a potential mechanism of spinal pain amplification. I have investigated and compared the properties of the synaptic input to projection and unidentified neurones to identify possible neuronal features which could favour the induction of LTP.

Global mEPSCs that represent a modulatory input to spinal neurones from the local neuronal network, occurred at significantly higher frequency in projection neurones than in unidentified neurones. Thus, projection neurones might be rendered more susceptible to nociceptive stimuli. This is all the more so as inhibitory modulation by the local network turned out to be relatively low in all investigated lamina I neurones.

However, the properties of primary afferent-evoked C-fibre responses were comparable for projection and unidentified neurones. Contrary to my initial hypothesis, the NMDA receptor-mediated transmission following application of single stimuli did not have special features in projection neurones. Interestingly, NMDA receptor-mediated currents of eEPSCs were found to exhibit a remarkable developmental decrease between postnatal day 18 and 27 that might contribute to spinal cord maturation and formation of the spinal synaptic network.

The results of the present study give further evidence for the particular role of lamina I projection neurones for the processing of nociceptive stimuli. However, additional studies will be necessary to elucidate all the interesting particularities of these neurones.