The aim of the study was to examine effects of sensorimotor cortex stimulation on pain in animal. A behavioral model investigated pain thresholds in deafferentated rats depending on cortex stimulation and two neurophysiological models studied different components of the jaw opening reflex (JOR) and tooth pulp evoked potentials (TPEPs) following cortical stimulation.

The behavioral model used 18 deafferentated (dorsal root rhizotomy) rats and 14 controls. Pain thresholds were measured before and after cortical stimulation using plantar test and tail-flick latencies. In the neurophysiological model, rats were implanted with tooth pulp, cerebral cortex, and digastric muscle electrodes. 15 animals were divided into three groups, receiving 60 Hz, 40 Hz and no cortical stimulation, respectively. TPEPs were recorded before, one, three and fi ve hours after continuous stimulation. 10 other rats were submitted to recordings after a single tooth pulp stimulation, while in 5 more rats we administrated conditioning and test stimulation. TPEPs and digastric EMG were simultaneously recorded. A multiresolution denoising method was used for signal processing.

Our results show a similar effect of the stimulation in man and experimental animals despite the differences in the organization of the cerebral cortex. Our results identify the interaction between the different components of the jaw opening reflex and the correlation to the cortical evoked response. The decrease in amplitude of TPEPs after cortical stimulation may reflect its anti-nociceptive effect.