Alterations of ultrasonic vocalization (USV) in Purkinje cell specific TSC1 knockout mouse

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Mice, and other rodents, are able to communicate using sounds in the ultrasonic range called ultrasonic vocalizations (USV). Quantitative and qualitative analysis of this activity gives information about the social interactions, for example in animal models of autistic spectrum disorders (ASD). USV was analyzed in a mouse model of tuberous sclerosis complex (TSC), where progressive degeneration of Purkinje cells (PC) occurs. TSC is an inherited human disorder with autistic like behavioral manifestations.
To evaluate the influence of PC insufficiency on USV activity, recordings of USV were made in transgenic mouse line lacking expression of hamartin (TSC1) in PC. USV was recorded in newborns from 2 – 14 postnatal day (PND) with use of the isolation test protocol.
Transgenic mouse line used for the experiments was established by PC-specific knockout of the *TSC1* gene. All animal used in that experiment were bred in the animal facility of the Department of Experimental Medicine at the Medical University of Silesia in Katowice. All experimental procedures were planned and performed according to the permission obtained from the Local Committee for Animal Experiments and Welfare.
This approach resulted in a progressive degeneration of PC in the cerebellar cortex. Analysis of obtained data revealed developmental changes in the USV activity of the pups with some traits characteristic only for the TSC1 knockout animals.
We concluded, that the progressing impairment of PC physiology resulted in disturbance of motor functions of the vocal apparatus and cerebellum dependent alterations of the social behavior.