Tactile sensory impairment of C-LTMR afferents in preterm children and interventional approaches (PreTouch)

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Affective touch is of central importance in social interactions and early development of mammals. It is transmitted by a neural pathway originating in the C-low-threshold mechanoreceptors (C-LTMRs). C-LTMRs are highly reactive to tactile stimulation observed in maternal care – licking behaviour in mice and slow stroking in humans. Thus, C-LMR mediated touch is one of the earliest forms of communication that enables the new-born to regulate arousal and emotions.

We aim to investigate sensory impairment of C-LTMR mediated touch in preterm-born infants and to map the time window of C-LTMR development (WP1 and 2). We will also investigate how such sensory impairment and parental characteristics affect the interaction of parents with their children. Using an animal model, WP3 will quantify how the selective inhibition/activation of C-LTMRs impairs/improves offspring reactions to arousal and social interaction. WP3 will also investigate if the negative consequences of maternal deprivation can be reversed by selective activation of C-LTMRs.

The project can provide results important for understanding tactile sensory and social impairments and their potential restitution by combining clinical research on pre-term born infants, innovative statistics and an entirely novel method of genetic engineering in mice. The results can provide ground-breaking insights in sensory developmental processes and lay the ground for a clinical intervention in preterm-born infants.