

ID No.	K1007		
Project Title	Mesenchymal Stromal Cell Therapy to Prevent Neurodevelopmental Disorders related to Low-Birth-Weight		
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Report			
In our rat model of prematurity and low birth weight (LBW), rat pups display hyperexcitability in the spinal cord and cortex, responsible for spasms and spasticity that have a deleterious impact on locomotion. These LBW rats also exhibit spontaneous hyperexcitability, deficits in information processing and memory deficits (Delcour et al., 2011, 2012ab; Ohshima et al., 2016; Coq et al., 2018, 2019; Tsuji et al., 2018). Compared to LBW rats induced by intrauterine hypoperfusion, LBW rats treated with mesenchymal stromal cells (MSCs) postnatally exhibit: • no significant improvement in hyperactivity assessed in empty open-field arena and partial improvement in the sociability tests. (Coq et al., paper in preparation) • no significant improvement in reduced signal intensities of neurotransmitters in the brain analyzed by imaging mass spectrometry. (Tsuji et al., paper in preparation) • We found no differences in the neuronal counts of the whole hippocampus and cytokine expression in cerebral spinal fluid and plasma between the 4 groups, including LBW and MSC treatment, indicative of no significant impact of MIUH and MSC administration in the two parameters • reduced hyperexcitability within the spinal cord network, characterized by control level rated-dependent depression using in vitro electrophysiological recordings but not completely restored expression of KCC2, a cotransporter of chloride that governs cell excitability (Coq et al., paper in preparation). These interesting results suggest an uncomplete restoration of normal organization of the sensorimotor circuitry within the spinal cord, but not of the hippocampal, cortical and cognitive network.			