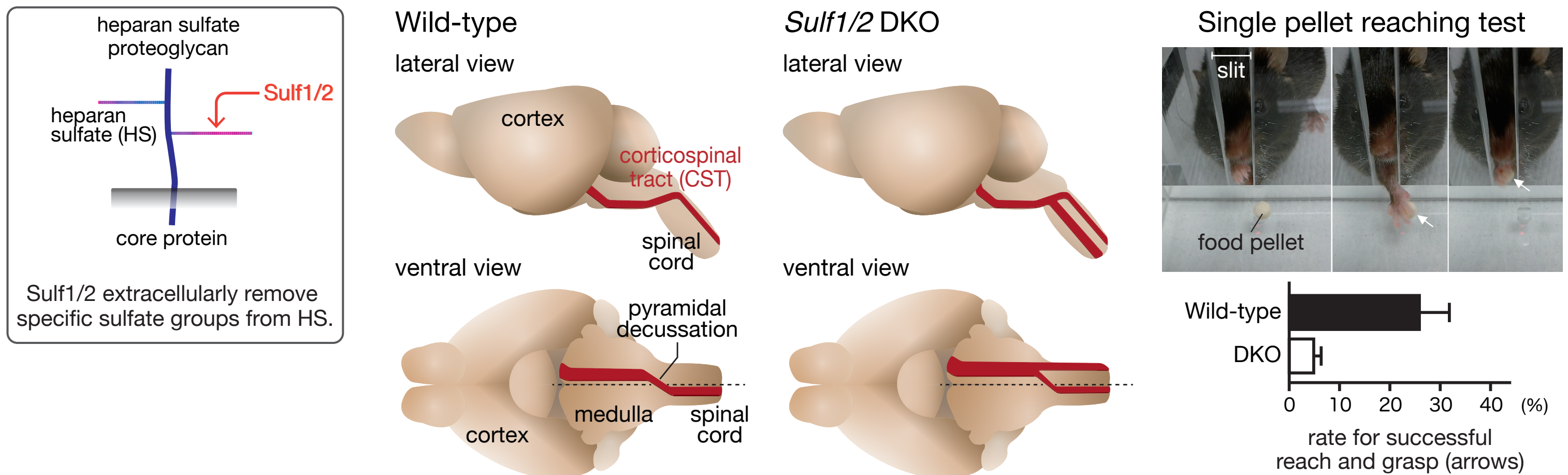


Abnormal pyramidal decussation and bilateral projection of the corticospinal tract axons in mice lacking the heparan sulfate endosulfatases, Sulf1 and Sulf2



Heparan sulfate (HS) interacts with a wide range of signaling molecules and their receptors. The endosulfatases, Sulf1 and Sulf2, regulate multiple signaling pathways positively or negatively through desulfation of HS. Here we report anatomical and functional defects of the corticospinal tract (CST) in *Sulf1/2* double knockout (DKO) mice. The CST plays an important role in controlling voluntary movement. In the wild-type mice, the CST fibers, originating in the motor cortex, extend onto the ventral medulla, and the majority of fibers cross the midline at the pyramidal decussation dorsally, then project to the contralateral spinal cord. In the DKO mice, some CST fibers normally cross the midline, whereas others extend ipsilaterally. Consistent with aberrant bilateral projections in the spinal cord, stimulation of 1 side of the motor cortex evokes bilateral responses in the forelimb muscles. Furthermore, the DKO mice perform poorly in skilled reaching and grasping tasks in a single pellet reaching test, indicating that they have impaired motor movements.

References: S Aizawa, T Okada et al., *Frontiers in Molecular Neuroscience* 12, 333, 2020

Contact: Prof. M Masu