Hindbrain Neurons in Breathing and Vocalization

Vortrag | 27.10. 2017 | 14.00 Uhr s.t. | Hörsaal H 13
Alle Interessenten sind herzlich eingeladen! / Everybody welcome!

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Development of dorsally emerging hindbrain and spinal cord neurons largely depends on the antagonistically activity of two well characterize transcription factors, Olig3 and Lbx1. In the first part of the talk, I will present recent data on hindbrain neurons critical for vocalization. By analyzing Olig3 mutant mice, we have recently identified the nucleus of the solitary tract (located in the dorsal hindbrain) as an essential component of the neuronal circuit that underlines mouse vocalization. Genetically engineered mice lacking the nucleus of the solitary tract are unable to produce calls and are neglected by their mothers. In the second part of the talk, I will show our recent identification of genes important in development and function of the Lbx1+ retrotrapezoid nucleus (located in the ventral hindbrain), a group of neurons known to be the principal CO2 sensor in the central nervous system. Mutation of such genes interferes with the proper response to CO2 in both humans and mice, and is causative of human pathologies as congenital hypoventilation syndromes.

Transverse section of the dorsal hindbrain depicting the nucleus of the solitary tract (red cells). This center receives sensory input from the periphery (axons label in green) and is essential for vocalization.

Transverse section of the ventral hindbrain displaying Lbx1 (green) and Phox2b (red) cells of the retrotrapezoid nucleus (yellow cells), a group of neurons, located underneath the ChAT+Phox2b+ (blue/red) facial motor (nVII) nucleus. Retrotrapezoid neurons are central in monitoring the levels of CO2 in blood.