

Molecular mechanism contributing to neuronal circuit formation found

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German scientists at Helmholtz Zentrum München have discovered how sensory and motor fibers interact during development of neuronal circuits in the limbs: Both types of nerve fibers can guide this process. With this finding, the researchers have made an important contribution to understanding how neural networks are formed during embryonic development and have found a new approach to explaining neurological disorders.

During [embryonic development](#), sensory and motor fibers interact to form nerves in the limbs. The research team led by Dr. Andrea Huber Brösamle of the Institute of Developmental Genetics of Helmholtz Zentrum München has now elucidated how this interaction functions at the molecular level: The cell surface receptor neuropilin-1 is present in both sensory and motor [nerve](#) fibers and controls their interaction in order to correctly regulate growth.

"We observed that motor and sensory axons were both able to guide and lead the formation of the spinal nerves of the arms and legs," said Rosa-Eva Hüttl and Heidi Söllner, lead authors of the study and doctoral students in Dr. Andrea Huber Brösamle's research group. This finding surprised the authors because it had previously been assumed that the motor axons were always responsible for establishing the correct trajectories.

In the same study, the researchers created a model to better elucidate structural changes in human neurodegenerative disorders and following

trauma : "Our next goal," said Dr. Huber Brösamle, "is to find out to what extent neuropilin-1 also controls the formation of fiber tracts in the brain."

More information: Huettl R.E. et al. (2011). Npn-1 contributes to axon-axon interactions that differentially control sensory and motor innervation of the limb. *PLoS Biol* 9(2): e1001020.

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