

Neuroscience Lecture

Novel ligand-receptor interactions for axon guidance and neural circuit assembly

Prof. Alexander Jaworski, Brown University, USA.

Talk abstract:

Guidance of axons to their correct targets is a key step in neural circuit formation during development, and it is mediated by molecular cues that activate receptors on the axonal growth cone. The Netrin-DCC and Slit-Robo ligand-receptor pairs mediate axon attraction and repulsion, respectively, and they are highly conserved across bilaterians, where they mediate axon pathfinding at the nervous system midline. The DCC and Robo receptor families have expanded over the course of evolution and now include additional members that no longer bind Netrins or Slits, raising the question whether these orphan receptors interact with other ligands to instruct neuronal wiring. We have indeed discovered novel axon guidance cues – WFIKKN and NELL proteins – that signal through divergent DCC and Robo family members, and genetic experiments demonstrate essential functions for these molecules in wiring the embryonic mouse nervous system. Additional structural studies and *in vitro* experiments provide insights into the multifunctionality and signaling mechanisms of the ligand-receptor complexes. Our work has identified multiple new players in axon guidance and reveals a remarkable diversity of ligand interactions for the DCC and Robo receptor families in neural circuit assembly.

Research description:

The Jaworski lab studies the cellular and molecular mechanisms of nervous system wiring. Research in the lab integrates molecular, cell biological, and mouse genetics approaches to understand how nascent axons are guided towards their targets and neurons are assembled into functional circuits during embryonic development. More info: <https://www.jaworskilab.com/>

Tuesday, 13th June 2023, 11.30am (CEST)

Location: Seminar Room LIFE & BRAIN (Geb. 76)
Ground Floor, Room No. C076.EG.612
Venusberg Campus-1
53127, Bonn

Hybrid: <https://uni-bonn.zoom.us/j/64217123801?pwd=RldTNUZyT2FNemFmVjBQSWkzL3VFQT09>

Meeting ID: 642 1712 3801

Passcode: 190909

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