Deutsche Forschungsgemeinschaft
German Research Foundation

Leibniz Lecture

Frank Bradke **Gottfried Wilhelm Leibniz Prize 2016**

Mechanisms of Axon Growth and Regeneration

Monday, November 13, 2017, 6:30 p.m.

Washington Plaza Hotel (National Ballroom A)
10 Thomas Circle NW, Washington, DC 20005

Reception to follow!

Almost everybody who has seen neurons under a microscope for the first time is fascinated by their beauty and their complex shape. Early on during development, however, neurons look round and simple without any signs of their future complexity. How do neurons develop their sophisticated structure? How do they initially generate domains that later have distinct functions within neuronal circuits, such as the axon? And, can a better understanding of the underlying developmental mechanisms help us in pathological conditions, such as a spinal cord injury, to induce axons to regenerate?

In this lecture, I will discuss the cytoskeleton as a driving force for initial neuronal polarization and axon growth. I will then explore how cytoskeletal changes help to reactivate the growth program of injured CNS axons to elicit axon regeneration after a spinal cord injury. Finally, I will discuss whether axon growth and synapse formation could represent mutually excluding processes. Following this developmental hypothesis helps us to generate a novel perspective on regeneration failure in the adult CNS and to envisage new paths to overcome it. Thus, this talk will describe how we can exploit developmental mechanisms to induce axon regeneration in the adult after a spinal cord injury.

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Frank Bradke studied biochemistry, anatomy and developmental biology at the Freie Universität Berlin and the University College London. In 1994, he received a B.Sc. degree in anatomy and developmental biology and in 1995 a degree in biochemistry. During his thesis, he conducted research at the EMBL, Heidelberg. He earned his PhD in 1999 from the Ruprecht-Karls-Universität Heidelberg. Shortly thereafter in 2000, as a postdoctoral fellow, he moved to Prof. Marc Tessier-Lavigne's laboratory at the University of California, San Francisco and Stanford. Then, in 2003, he became a Max Planck Institute research group leader at the MPI of Neurobiology, Martinsried. In 2009, Frank Bradke habilitated in neurobiology at the Ludwig-Maximilians University Munich. He received the IRP-Schellenberg-Prize in 2011 and became full professor at the University of Bonn and senior research group leader for axonal growth and regeneration at the German Center for Neurodegenerative Diseases (DZNE) in Bonn. Frank Bradke was elected to the European science organization EMBO in 2013 and was elected a member of the Leopoldina, the German National Academy of Sciences, in 2014. In 2016, Frank Bradke received the Gottfried Wilhelm Leibniz Prize, the most important research prize in Germany.

The **Gottfried Wilhelm Leibniz Prize** is the highest honor awarded in German research. Established in 1985, the prize provides an unparalleled degree of freedom to outstanding scientists and academics to pursue their research interests. Up to ten prizes are awarded annually with a maximum of €2.5 million per award. Prize recipients are awarded the prize solely on the basis of the scientific quality of their work. The Leibniz Prize honors the well-known scientist and humanist Gottfried Wilhelm Leibniz (1646-1716), who was a leading figure in the fields of philosophy, mathematics, physics and theology.

The **German Research Foundation (DFG)** is the central, self-governing organization funding science and basic research in Germany. Serving all branches of science and the humanities, its members comprise German research universities, non-university research institutions, scientific associations and the Academies of Science and the Humanities.

The chief task of the DFG is to fund the best research projects by scientists and academics at universities and research institutions, which are selected on the basis of a multi-layered peer review process. The DFG is a cornerstone of Germany’s strength as a research nation and it plays a key role in structuring academic research in Europe.

The DFG organizes Leibniz Lectures in different regions across the world in order to promote the prize, the research conducted by the prize holders, and the high quality of German science in general.