



Leibniz Lecture

Magdalena Götz **Gottfried Wilhelm Leibniz Prize 2007**

Mechanisms of Neurogenesis and Neural Repair

Monday, November 05, 2018, 6:30 p.m.

*Hilton San Diego Bayfront (Aqua 300)
1 Park Blvd, San Diego, CA 92101*



Reception to follow!

To understand how such a complex and amazing organ like the brain develops is a fascinating and important task in itself – not the least to know how the huge variability of vertebrate brains came about or to help understanding function by knowing how the circuit is assembled. A further important aspect to understanding neurogenesis, when and where it works sufficiently, is to then be able to elicit it for neuronal replacement options. After all, at the moment, neurons cannot be replaced at all and hence any neurological defects due to lost neurons cannot be treated causally at present time.

I will present some of our latest findings regarding novel mechanisms of how neurogenesis is regulated in the developing and adult brain to then move towards the options for using this knowledge for repair. I will discuss the different strategies of neuronal replacement therapy and focus then on the road we have pioneered, namely to turn local reactive glial cells into neurons after brain injury. I will also discuss our latest findings on how new neurons can integrate in a brain region, such as the murine cerebral cortex, that normally never integrates new neurons. Taken together, our knowledge about basic mechanisms of neurogenesis allowed us to make great strides towards neuronal repair.



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Magdalena Götz studied biology at the University of Tübingen. Her Diploma and PhD work in the lab of Jürgen Bolz at the FMI in Tübingen focused on the mechanisms of how input connections to the cerebral cortex form during development as well as how specific neuronal subtypes are specified. She received the Otto-Hahn Award of the Max Planck Society for this work. She then joined the National Institute for Medical Research in London to use retroviral vectors for clonal analysis in the lab of Jack Price and identified mechanisms delineating neighboring forebrain regions. She started her own lab at the Max-Planck Institute for Neurobiology, where she made the breakthrough discovery that radial glial cells are neural stem cells. This inspired her to attempt turning adult mature glial cells into neurons, in 2002 in vitro and in 2005 in vivo. In order to determine which glial cells best to convert to neurons after traumatic brain injury, she systematically examined the roles of distinct glial subtypes after traumatic brain injury. She was appointed Director of the Institute of Stem Cell Research at the Helmholtz Center Munich in 2004 and Chair of Physiological Genomics, now at the Biomedical Center of the Ludwig-Maximilians University in Martinsried Munich. This work led to the discovery of a novel role of reactive astrocytes and the in vivo direct neuronal reprogramming reaching a very high efficiency and maturity. Magdalena Götz became a member of EMBO in 2006, of the Leopoldina National Academy of Sciences in 2008, and the Bavarian Academy of Sciences in 2017. She received the Familie Hansen Prize and the Gottfried Wilhelm Leibniz Prize of the DFG in 2007, followed by many other awards such as the Ernst Schering Prize in 2015 and the Roger de Spolberch Prize in 2017.

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.