

# Biozentrum Lectures

## Neural stem cells and brain development – from *Drosophila* to humans Jürgen Knoblich

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Lecture Hall 1, Pharmazentrum  
Klingelbergstrasse 50/70, Basel

Molecular  
Life Sciences.

# Neural stem cells and brain development – from *Drosophila* to humans

The human brain is the most complex of all organs. Its huge complexity develops from a relatively small number of stem and progenitor cells. These undifferentiated cells are an inexhaustible source with the unique ability to continually renew themselves. When neural stem cells divide, one of the resulting daughter cells continues to divide in a stem-cell like manner while the other cell generates an enormous number and divergence of cell types found in the central nervous system.

The fruit fly *Drosophila* is an important model organism to study the underlying molecular mechanisms of how neural stem cells generate the right neurons at the right time. A newly established 3D cell culture system allows testing the conservation of the identified mechanisms in humans and modeling brain development starting from stem cells. The Biozentrum Lecture will focus on the transfer of knowledge from *Drosophila* to humans and how this knowledge can be applied to diseases such as human brain tumors.



Dr. Jürgen Knoblich is Senior Scientist and Deputy Director at the Institute of Molecular Biotechnology of the Austrian Academy of Sciences (IMBA) in Vienna. He studies neural stem cells and the development of the nervous system in *Drosophila* and vertebrates. He identified key regulators of asymmetric stem cell division and demonstrated that mutations in genes controlling cell division drive tumor development in the brain. For his outstanding scientific achievements he was awarded the Wittgenstein Prize (2009) and the Erwin Schrodinger Prize (2012). In 2010 Knoblich received an Advanced Research Grant of the European Research Council (ERC).

The biochemist received his PhD at the Friedrich Miescher Laboratorium of the Max Planck Society, Tübingen, Germany. Following postdoctoral research at the University of California, San Francisco, he was promoted to group leader at the Institute of Molecular Pathology in Vienna, Austria. In 2004, Knoblich became senior scientist at the IMBA and one year later Deputy Director of this institution. Furthermore, he is member of several scientific societies including the European Molecular Biology Organisation (EMBO), the Austrian Academy of Sciences and the Academia Europaea.

The Biozentrum Lectures are organized by the Biozentrum, University of Basel. The lectures present speakers who have made outstanding contributions in the field of Life Sciences. The goal of the series is to highlight the work of these individuals in an event that brings together researchers from the entire community in Basel and its surroundings.

Past speakers in the Biozentrum Lectures series:

**F. Ulrich Hartl**

Director of the Department of Cellular Biochemistry,  
Professor, Max Planck Institute of Biochemistry, Martinsried

**Elizabeth Blackburn**

Nobel Prize Laureate  
Professor, University of California, San Francisco

**Andrej Sali**

Vice Chair, Department of Bioengineering and Therapeutic Sciences  
Professor, University of California, San Francisco

**James E. Rothman**

Chairman, Department of Cell Biology  
Professor, Department of Chemistry, Yale University

**Thomas Walz**

Investigator, Howard Hughes Medical Institute  
Professor, Department of Cell Biology, Harvard Medical School

**Austin Smith**

Director, Wellcome Trust Centre for Stem Cell Research,  
University of Cambridge

**Tim Hunt**

Cancer Research UK,  
Clare Hall Laboratories, South Mimms, Hertfordshire

**Laurent Keller**

Department of Ecology and Evolution,  
University of Lausanne