Prof. Jürgen A. Knoblich
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Most important awards, prizes and academies

Societies: 2020 Board of Directors, ISSCR (International Society for Stem Cell Research); 2014 EMBO council, elected member; 2013 Austrian Academy of Sciences, elected full member; 2012 Academia Europaea, elected member; 2002 EMBO (European Molecular Biology Organisation), elected member; 2002 ISSCR (International Society for Stem Cell Research), Member. *Research Awards:* 2016 Advanced Research Grant, European Research Council (ERC); 2015 Ernst Klenk Lecture, University of Cologne; 2015 Sir Hans Krebs Medal, Federation of European Biochemical Societies (FEBS); 2012 Erwin Schroedinger Prize, Austrian Academy of Sciences (ÖAW); 2010 Advanced Research Grant; European Research Council (ERC); 2010 Karl Friedrich Bonhoeffer Lecture, Max Planck Institute for Bio-physical Chemistry, Goettingen; 2009 Wittgenstein Prize Austrian Science Fund (FWF); 2003 Early Career Award, European Life Scientist Organization (ELSO); 2001 Young Investigator Award, European Molecular Biology Organisation (EMBO); 2001 Anniversary Award, Federation of the European Biochemical Societies (FEBS). *Fellowships*: 1994 Postdoctoral Fellowship (07/94-07/96), European Molecular Biology Organisation (EMBO); 1996 Postdoctoral Fellowship (07/96 – 09/97), Howard Hughes Medical Institute.

Summary of scientific research

Juergen Knoblich is a developmental neuroscientist studying human brain development and psychiatric disorders. His laboratory is interested in the development of the human brain and the mechanisms of neuro-developmental disorders. To analyze this process, they have developed cerebral organoids, a 3D culture method that recapitulates the early steps of human brain development starting from pluripotent stem cells. By growing organoids from disease patients, they were able to model microcephaly and demonstrate for the first time that human neurodevelopmental disorders can be studied in 3D culture. Using the new model system, they have developed in vitro models for the long-distance migration of human interneurons between brain areas. They were also able to recapitulate brain tumor formation and show that in vitro grown human brain tumors can be used for testing anti-tumor drugs. Their goal is to address more complex neuro-developmental disorders like epilepsy and autism and recapitulate long-range connections between functionally distinct brain areas.

Main publications

Esk C.*, Lindenhofer D.*, Haendeler S., Schroeder B., Pflug F., Elling U., Zuber J., von Haeseler A., Knoblich J.A. (2020). A human tissue screen identifies a regulator of ER secretion as a brain size determinant. *Science* 370(6519): 935-941. *equal contribution; Bonnay F., Veloso A., Steinmann V., Köcher T., Abdusselamoglu M.D., Bajaj S., Rivelles E., Landskron L., Esterbauer H., Zinzen R.P. and Knoblich J.A. (2020). Oxidative metabolism drives immortalization of neural stem cells during tumorigenesis. *Cell* (in press); Homem, C.C., Steinmann, V., Burkard, T.R., Jais, A., Esterbauer, H., and Knoblich, J.A. (2014). Ecdysone and mediator change energy metabolism to terminate proliferation in Drosophila neural stem cells. *Cell 158*, 874-888; Eroglu, E., Burkard, T.R., Jiang, Y., Saini, N., Homem, C.C., Reichert, H., and Knoblich, J.A. (2014). SWI/SNF Complex Prevents Lineage Reversion and Induces Temporal Patterning in Neural Stem Cells. *Cell 156*, 1259-1273; Lancaster, M.A., Renner, M., Martin, C.A., Wenzel, D., Bicknell, L.S., Hurles, M.E., Homfray, T., Penninger, J.M., Jackson, A.P., and Knoblich, J.A. (2013). Cerebral organoids model human brain development and microcephaly. *Nature 501*, 373-379; Mummery-Widmer, J.L., Yamazaki, M., Stoeger, T., Novatchkova, M., Chen, D., Dietzl, G., Dickson, B.J., and Knoblich, J.A. (2009) Genome-wide analysis of Drosophila external sensory organ development by transgenic RNAi, Nature *458*, 987-992; Wirtz-Peitz, F., Nishimura, T., and Knoblich, J.A. (2008). Linking cell cycle to asymmetric division: Aurora-A phosphorylates the Par complex to regulate Numb localization, *Cell 135*, 161-173; Neumüller, R.A., Betschinger, J., Fischer, A., Bushati, N., Poernbacher, I., Mechtler, K., Stephen M. Cohen, S.M. and Knoblich, J.A. (2008). Mei-P26 regulates micro RNAs and cell growth in the *Drosophila* ovarian stem cell lineage, *Nature 454*, 241-245; Betschinger, J., Mechtler, K., and Knoblich, J.A. (2006). Asymmetric segregation of the tumor suppressor brat regulates self-renewal in Drosophila neural stem cells. *Cell 124*, 1241-1253; Emery, G., Hutterer, A., Berdnik, D., Mayer, B., Wirtz-Peitz, F., Gonzalez Gaitan, M., and Knoblich, J.A.(2005). Asymmetric rab11 endosomes regulate Delta recycling and specify cell fate

in the Drosophila nervous system. *Cell 122*, 763-773; Betschinger, J., Mechtler, K. and Knoblich, J.A. (2003). The Par complex directs asymmetric cell division by phosphorylating the cytoskeletal protein Lgl. *Nature, 422*, 326-330.