

## Benjamin Rost

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### Curriculum vitae

- 2014 Grass fellow at the Marine Biology Laboratory, Woods Hole, Ma, USA
- since 2013 Postdoc at the German Center for Neurodegenerative Diseases, (DZNE), laboratory of Prof. Dietmar Schmitz, Charité Berlin
- 2012-13 Postdoc in the laboratory of Prof. Christian Rosenmund, Neurocure / CCO, Charité Berlin
- 2006-11 PhD Thesis in the Neuroscience Research Centre, laboratory of Prof. Dietmar Schmitz, Charité Berlin
- 2005 Diploma / MSc. in biomedical science. Dept. of Pharmacology, Prof. Gudermann
- 2000-05 Studies in "Humanbiologie" (biomedical science), Philipps-University Marburg, Germany

### Research fields

I am interested in creating and applying new molecular tools to investigate signaling cascades underlying synapse function. Deciphering these pathways will allow us to understand how neurons communicate, process and shape information flow in the brain under physiological and pathophysiological conditions. I develop novel optogenetic tools, which we express in cultures of hippocampal neurons using lentiviral and adeno-associated viral particles. By combining optogenetic actuators and genetically encoded fluorescent indicators, these tools allow me to modulate and image neuronal activity with light.

### Activities in the scientific community, honors, awards

- 2016 Principle investigator (PI) in the Priority Programme "Next Generation Optogenetics: Tool Development and Application" (SPP 1926) by the German Research Foundation (DFG/ Deutsche Forschungsgemeinschaft); Co-PI: Prof. Peter Hegemann
- 2014 Grass fellowship for research stay at the Marine Biology Laboratory, Woods Hole, USA
- 2009 1st Price for Student's Talks, Berlin Brain Days 2009
- 2008 2nd Price for Poster Presentations, Berlin Brain Days 2008
- 2008-10 associated Fellow, Graduate Program 1123 (GRK1123), German Research Foundation (Deutsche Forschungsgemeinschaft, DFG)
- 2007-11 Fellow, PhD Program Medical Neuroscience, Charité Berlin
- 2001-10 Scholarship and Fellow, e-fellows.net, Germany
- 2000-05 Scholarship and Fellow, German National Merit Foundation (Studienstiftung des deutschen Volkes)

## Publications

- Kreye J, Wenke NK, Chayka M, Leubner J, Murugan R, Maier N, Jurek B, Ly LT, Brandl D, Rost BR, Stumpf A, Schulz P, Radbruch H, Hauser AE, Pache F, Meisel A, Harms L, Paul F, Dirnagl U, Garner C, Schmitz D, Wardemann H, and Pruss H. 2016. *Human cerebrospinal fluid monoclonal N-methyl-D-aspartate receptor autoantibodies are sufficient for encephalitis pathogenesis*. Brain 139(Pt 10):2641-52.
- Grauel MK, Maglione M, Reddy-Alla S, Willmes CG, Brockmann MM, Trimbuch T, Rosenmund T, Pangalos M, Vardar G, Stumpf A, Walter AM, Rost BR, Eickholt BJ, Haucke V, Schmitz D, Sigrist SJ, and Rosenmund C. 2016. *RIM-binding protein 2 regulates release probability by fine-tuning calcium channel localization at murine hippocampal synapses*. Proc Natl Acad Sci U S A 113(41):11615-20.
- Rost BR, Schneider F, Grauel MK, Wozny C, C GB, Blessing A, Rosenmund T, Jentsch TJ, Schmitz D, Hegemann P, and Rosenmund C. 2015. *Optogenetic acidification of synaptic vesicles and lysosomes*. Nat Neurosci 18(12):1845-52.
- Koo SJ, Kochlamazashvili G, Rost B, Puchkov D, Gimber N, Lehmann M, Tadeus G, Schmoranzner J, Rosenmund C, Haucke V, and Maritzen T. 2015. *Vesicular Synaptobrevin/VAMP2 Levels Guarded by AP180 Control Efficient Neurotransmission*. Neuron 88(2):330-44.
- Watanabe S, Trimbuch T, Camacho-Perez M, Rost BR, Brokowski B, Sohl-Kielczynski B, Felies A, Davis MW, Rosenmund C, and Jorgensen EM. 2014. *Clathrin regenerates synaptic vesicles from endosomes*. Nature 515(7526):228-33.
- Watanabe S, Rost BR, Camacho-Perez M, Davis MW, Sohl-Kielczynski B, Rosenmund C, and Jorgensen EM. 2013. *Ultrafast endocytosis at mouse hippocampal synapses*. Nature 504(7479):242-7.
- Vogt J, Glumm R, Schluter L, Schmitz D, Rost BR, Streu N, Rister B, Suman Bharathi B, Gagiannis D, Hildebrandt H, Weinhold B, Muhlenhoff M, Naumann T, Savaskan NE, Brauer AU, Reutter W, Heimrich B, Nitsch R, and Horstkorte R. 2012. *Homeostatic regulation of NCAM polysialylation is critical for correct synaptic targeting*. Cell Mol Life Sci 69(7):1179-91.
- Kaden D, Harmeier A, Weise C, Munter LM, Althoff V, Rost BR, Hildebrand PW, Schmitz D, Schaefer M, Lurz R, Skodda S, Yamamoto R, Arlt S, Finckh U, and Multhaup G. 2012. *Novel APP/Abeta mutation K16N produces highly toxic heteromeric Abeta oligomers*. EMBO Mol Med 4(7):647-59.
- Rost BR, Nicholson P, Ahnert-Hilger G, Rummel A, Rosenmund C, Breustedt J, and Schmitz D. 2011. *Activation of metabotropic GABA receptors increases the energy barrier for vesicle fusion*. J Cell Sci 124(Pt 18):3066-73.
- Rost BR, Breustedt J, Schoenherr A, Grosse G, Ahnert-Hilger G, and Schmitz D. 2010. *Autaptic cultures of single hippocampal granule cells of mice and rats*. Eur J Neurosci 32(6):939-47.
- Harmeier A, Wozny C, Rost BR, Munter LM, Hua H, Georgiev O, Beyermann M, Hildebrand PW, Weise C, Schaffner W, Schmitz D, and Multhaup G. 2009. *Role of amyloid-beta glycine 33 in oligomerization, toxicity, and neuronal plasticity*. J Neurosci 29(23):7582-90.
- Sel S, Rost BR, Yildirim AO, Sel B, Kalwa H, Fehrenbach H, Renz H, Gudermann T, and Dietrich A. 2008. *Loss of classical transient receptor potential 6 channel reduces allergic airway response*. Clin Exp Allergy 38(9):1548-58.
- Motazacker MM, Rost BR, Hucho T, Garshasbi M, Kahrizi K, Ullmann R, Abedini SS, Nieh SE, Amini SH, Goswami C, Tzschach A, Jensen LR, Schmitz D, Ropers HH, Najmabadi H, and Kuss AW. 2007. *A defect in the ionotropic glutamate receptor 6 gene (GRIK2) is associated with autosomal recessive mental retardation*. Am J Hum Genet 81(4):792-8.
- Heilborn U, Rost BR, Arborelius L, and Brodin E. 2007. *Arthritis-induced increase in cholecystokinin release in the rat anterior cingulate cortex is reversed by diclofenac*. Brain Res 1136(1):51-8.