

Curriculum Vitae

PERSONAL INFORMATION

Professor Dr. rer. nat. Stephan J. Sigrist

Date of birth: 9 September 1967. Nationality: German

<http://genetik.bcp.fu-berlin.de/html/home.html>

• CURRENT POSITION(S)

Since 2014 Einstein Professor
Since 2012 Spokesperson of the Collaborative Research Center 958 “Membrane Scaffolding”
Since 2009 Co-Director of the DFG Cluster of Excellence NeuroCure, Charité
Universitätsmedizin Berlin, Germany
Since 2008 Full Professor (W3) in Genetics, Institute of Biology, Freie Universität Berlin,
Germany

• EDUCATION

2005 Habilitation, University Medical Center Göttingen, Georg-August-Universität
Göttingen, Germany (Award for Best Habilitation)
1997 PhD in the Field of Molecular Genetics and Biochemistry, Friedrich Miescher
Laboratory of the Max Planck Society, Tübingen, Germany; Advisor: Prof. Dr.
Christian F. Lehner
1993 Diploma in Biochemistry, Faculty of Medicine, Eberhard Karls Universität Tübingen,
Germany

• PREVIOUS POSITIONS

2006 – 2008 Associate Professor (W2) for Experimental Biomedicine and Bio-Imaging, Rudolf
Virchow Center of Excellence, Universität Würzburg, Germany
2001 – 2006 Principal Investigator of the Independent Junior Research Group “Neuroplasticity”
of the Max-Planck-Society at the European Neuroscience Institute Göttingen,
Germany
1997 – 2000 Postdoc at Friedrich Miescher Laboratory (FML) of the Max Planck Society,
Tübingen, Germany

• FELLOWSHIPS AND AWARDS

Since 2014 Einstein Professorship of the Einstein Foundation Berlin, Germany
2005 Best Habilitation Award awarded by the University Medical Center Göttingen,
Georg-August-Universität Göttingen, Germany
2000 EMBO Long-term Fellowship: Funding of Postdoc position by European Molecular
Biology Organization Heidelberg, Germany
2000 HFSP Long-term Fellowship: Funding of Postdoc position, Long-term Fellowship
Human Frontier Science Program Organization Strasbourg, France
1997-2000 Habilitation-Fellowship Claußen Foundation: Funding of Postdoc position, Germany

• SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

Since 2001 Supervision of 30 PhD theses in biology, biochemistry, neurosciences and
medicine, 8 of which are ongoing; supervision of 10 postdocs and 15 master
students.

- **TEACHING ACTIVITIES (selection)**

- 2008– 2016 Lecturer – Genetics for Bachelor Students, Freie Universität Berlin, Germany
2008– 2016 Lecturer – NeuroBiology and Neuro-Genetics MA-Program, Freie Universität Berlin, Germany
2013 Faculty Marine Biological Laboratory “Woodshole Summer course Neurobiology”

- **ORGANISATION OF SCIENTIFIC MEETINGS (selection)**

- 2014 Main Organizer of the international meeting “Membranes and Modules,” Berlin, Germany, (about 500 participants)
2010 Organization of the workshop “Trends in Microscopy” with Nobel Prize winner Professor Stefan Hell, Berlin, Germany

In addition, Stephan Sigrist hosted and organized many smaller events.

- **INSTITUTIONAL RESPONSIBILITIES**

- Since 2012 Spokesperson CRC 958 “Membrane Scaffolding,” Freie Universität Berlin, Germany
Since 2009 Directorial Board Member, NeuroCure Cluster of Excellence, Charité – Universitätsmedizin Berlin and Freie Universität Berlin, Berlin, Germany (first election period 2009-2014, re-elected for 2014-2019)
2002 – 2005 Spokesman of Junior Groups of Max Planck Society

- **COMMISSIONS OF TRUST**

Stephan Sigrist has been serving as an evaluator for the German Research Foundation and also on many occasions as an evaluator of research proposals in Spain, the Netherlands, France, Austria and the UK.

Permanent memberships of advisory boards and review panels:

- Since 2016 Head of Scientific Advisory Board of Leibniz Institute for Neurobiology, Magdeburg, Germany
Since 2012 Elected Member of the German Research Foundation (DFG) review board “Neurosciences,” Germany; re-elected 2016
Since 2012 Elected Member, German Research Foundation (DFG) “Emmy Noether Program” committee of the review board “Neurosciences” (re-elected in 2016)
Since 2011 Advisory Board BioTechMed-Graz, University of Graz, Austria
Since 2010 Advisory Board NaWi Graz, Austria (collaboration between University of Graz and Technical University of Graz)

- **MAJOR COLLABORATIONS**

Stefan Hell (Göttingen&Heidelberg) for super-resolution light microscopy

David Oswald (Berlin), Bertram Gerber (Magdeburg) and Andre Fiala (Göttingen) for learning assays and opto-physiological analysis of the *Drosophila* brain;

Jörg Geier (Berlin) for *Drosophila* CNS recordings;

David DiGregorio (Paris) for biophysics of Ca²⁺-secretion coupling;

Henri Jaspers (Buck Institute, USA) for aging in *Drosophila*;

Christian Rosenmund and Dietmar Schmitz (Berlin) for synapse genetics and electrophysiology in mouse model;

Benjamin Judkewitz (Berlin) for use of adaptive optics on biological samples

Frank Madeo (Graz) and Guido Kroemer (Paris) for mechanisms of aging in yeast and mouse

Alberto Bacci (Paris) for interneuron recordings of mouse cortex

Ongoing and submitted grants and funding

On-going Grants

<i>Project Title</i>	<i>Funding source</i>	<i>Amount (Euros)</i>	<i>Period</i>	<i>Role in the project</i>
Active Zone Transport and Autism	DFG – German Research Foundation (CRC 665)	331,200	2009 – 2017	PI
Synaptic Active Zone Scaffold. Organization of the synaptic zone scaffold by Bruchpilot and RIM binding protein	DFG – German Research Foundation (CRC 958)	984,160	2015 - 2019	Spokes-person of the CRC
Active zone core proteins in interaction with synaptic Ca ²⁺ channels	DFG – German Research Foundation	302,400	2013 – 2017	PI
Einstein Professorship	Einstein Stiftung	140,000	2014 – 2019	PI
Closing the cycle: Submodule in der Kopplung synaptischer Exo- und Endozytose	DFG – German Research Foundation (CRC 740)	575,760	2015-2018	PI
Die neurobiologischen Grundlagen Polyamin-induzierter Protektion gegen altersassoziierte Einschränkungen der Gedächtnisfunktionen (SMARTAGE)	Bundesministerium für Bildung und Forschung (BMBF)	470,131	2015-2020	Spokes-person of the joint project with 6 partners
Molecular Switches in the Spatio-Temporal Control of Cellular Signal Transmission	DFG – German Research Foundation (CRC TRR 186)	200,800	2016 - 2020	PI
Nanoscale cellular and molecular fingerprints of synaptic diversity	DFG – German Research Foundation (ANR NanoSynDiv)	333,100	2017-2021	PI

Completed Projects (selection)

<i>Project Title</i>	<i>Funding source</i>	<i>Role in the project</i>
Bernstein Fellows	Bernstein Center for Computational Neuroscience (BCCN), Göttingen	PI
Collaborative Research Center for Theoretical Biology: Robustness, Modularity and Evolutionary Design of Living Systems (awarded as best project)	DFG -German Research Foundation (CRC 618)	PI
Memory for Campus	Research Training Group	PI

Ten representative publications

- Reddy-Alla S, Böhme MA, Reynolds E, Beis C, Grasskamp AT, Mampell MM, Maglione M, Jusyte M, Rey U, Babikir H, McCarthy AW, Quentin C, Matkovic T, Bergeron DD, Mushtaq Z, Göttfert F, Oswald D, Mielke T, Hell SW, **Sigrist SJ**, Walter AM. Stable Positioning of Unc13 Restricts Synaptic Vesicle Fusion to Defined Release Sites to Promote Synchronous Neurotransmission. *Neuron*. 2017 Sep 13;95(6):1350-1364.e12.
- Gupta V.K., Pech, .U., Bhukel, A., Fulterer, A., Ender, A., Mauermann, S.F., Andlauer, T.F.M., Antwi-Adjei, E., Beuschel, C., Thriene, K., Maglione, M., Quentin, C., Bushow R., Schwärzel, M., Mielke, T., Madeo, F., Dengjel, J., Fiala, A., **Sigrist, S.J.** (2016). Spermidine suppresses age-associated memory impairment by preventing adverse increase of presynaptic active zone size and release. *Plos Biology*, 29;14(9):e1002563
- Böhme, M.A., C. Beis, S. Reddy-Alla, E. Reynolds, M.M. Mampell, A.T. Grasskamp, J. Lutzkendorf, D.D. Bergeron, J.H. Driller, H. Babikir, F. Gottfert, I.M. Robinson, C.J. O'Kane, S.W. Hell, M.C. Wahl, U. Stelzl, B. Loll, A.M. Walter, and **S.J. Sigrist**. (2016). Active zone scaffolds differentially accumulate Unc13 isoforms to tune Ca²⁺ channel-vesicle coupling. *Nature Neuroscience*. 19(10):1311-20
- Muhammad, K., S. Reddy-Alla, J.H. Driller, D. Schreiner, U. Rey, M.A. Bohme, C. Hollmann, N. Ramesh, H. Depner, J. Lutzkendorf, T. Matkovic, T. Gotz, D.D. Bergeron, J. Schmoranzner, F. Goettfert, M. Holt, M.C. Wahl, S.W. Hell, P. Scheiffele, A.M. Walter, B. Loll, and **S.J. Sigrist**. (2015). Presynaptic spinophilin tunes neurexin signalling to control active zone architecture and function. *Nature Communications* 6, 8362.
- Gupta, V.K., L. Scheunemann, T. Eisenberg, S. Mertel, A. Bhukel, T.S. Koemans, J.M. Kramer, K.S. Liu, S. Schroeder, H.G. Stunnenberg, F. Sinner, C. Magnes, T.R. Pieber, S. Dipt, A. Fiala, A. Schenck, M. Schwaerzel, F. Madeo, and **S.J. Sigrist**. (2013). Restoring polyamines protects from age-induced memory impairment in an autophagy-dependent manner. *Nature Neuroscience*. 16, 1453-1460.
- Matkovic, T., M. Siebert, E. Knoche, H. Depner, S. Mertel, D. Oswald, M. Schmidt, U. Thomas, A. Sickmann, D. Kamin, S.W. Hell, J. Burger, C. Hollmann, T. Mielke, C. Wichmann, and **S.J. Sigrist**. (2013). The Bruchpilot cytomatrix determines the size of the readily releasable pool of synaptic vesicles. *Journal of Cell Biology* 202, 667-683.
- Owald, D., O. Khorramshahi, V.K. Gupta, D. Banovic, H. Depner, W. Fouquet, C. Wichmann, S. Mertel, S. Eimer, E. Reynolds, M. Holt, H. Aberle, and **S.J. Sigrist**. (2012). Cooperation of Syd-1 with Neurexin synchronizes pre- with postsynaptic assembly. *Nature Neuroscience* 15, 1219-1226.
- Liu, K.S., M. Siebert, S. Mertel, E. Knoche, S. Wegener, C. Wichmann, T. Matkovic, K. Muhammad, H. Depner, C. Mettke, J. Buckers, S.W. Hell, M. Muller, G.W. Davis, D. Schmitz, and **S.J. Sigrist**. (2011). RIM-binding protein, a central part of the active zone, is essential for neurotransmitter release. *Science* 334, 1565-1569.
- Schmid, A., S. Hallermann, R.J. Kittel, O. Khorramshahi, A.M. Frolich, C. Quentin, T.M. Rasse, S. Mertel, M. Heckmann, and **S.J. Sigrist**. (2008). Activity-dependent site-specific changes of glutamate receptor composition in vivo. *Nature Neuroscience* 11, 659-666.

Kittel, R.J., C. Wichmann, T.M. Rasse, W. Fouquet, M. Schmidt, A. Schmid, D.A. Wagh, C. Pawlu, R.R. Kellner, K.I. Willig, S.W. Hell, E. Buchner, M. Heckmann, and **S.J. Sigrist**. (2006). Bruchpilot promotes active zone assembly, Ca²⁺ channel clustering, and vesicle release. *Science* 312, 1051-1054.

Cumulated citation of these 10 representative publications: > 1300
Total number of publications 95; Total number of citations > 60000; h-index 35

Invited Reviews and editorials in the last five years (selection)

Sigrist, S.J., and A.G. Petzoldt. 2016. Neuroscience: Nanocolumns at the heart of the synapse. *Nature*. 11;536(7615):151-2

Petzoldt, A.G., J. Lutzkendorf, and **S.J. Sigrist**. 2016. Mechanisms controlling assembly and plasticity of presynaptic active zone scaffolds. *Curr Opin Neurobiol*. 39:69-76.

Böhme, M.A., and **S.J. Sigrist**. 2015. Lights on for the molecular players of presynaptic plasticity. *Neuron*. 86:603-604.

Walter, A.M., V. Haucke, and **S.J. Sigrist**. 2014. Neurotransmission: spontaneous and evoked release filing for divorce. *Curr Biol*. 24:R192-194.

Maglione, M., and **S.J. Sigrist**. 2013. Seeing the forest tree by tree: super-resolution light microscopy meets the neurosciences. *Nature Neuroscience*. 16:790-797.

Sigrist, S.J., and B.L. Sabatini. 2012. Optical super-resolution microscopy in neurobiology. *Curr Opin Neurobiol*. 22:86-93.

Sigrist, S.J., and D. Schmitz. 2011. Structural and functional plasticity of the cytoplasmic active zone. *Curr Opin Neurobiol*. 21:144-150.

Haucke, V., E. Neher, and **S.J. Sigrist**. 2011. Protein scaffolds in the coupling of synaptic exocytosis and endocytosis. *Nature reviews. Neuroscience*. 12:127-138.

Invited presentations to peer-reviewed, internationally established conferences and/or international advanced schools

Stephan Sigrist has been invited to more than 100 presentations. Some examples:

- 5th European Synapse Meeting, Bristol, UK. 2015
- Gordon Research Conference "Polyamines," Waterville Valley NH, USA. 2015
- Gordon Research Conference "Excitatory Synapses and Brain Function," Newport RI, USA. 2015
- 17th International Neuroscience Winter Conference, Sölden, Austria. 2015
- 16th International Neuroscience Winter Conference, Sölden, Austria; 2014
- EMBO Conference "The Molecular and Developmental Biology of *Drosophila*," Crete, Greece. 2014
- 9th FENS Forum of Neuroscience, Milan, Italy. 2014
- 9th World Congress on Alternatives and Animal Use in the Life Sciences, Praha, Czech Republic. 2014
- ENINET Annual Meeting, Freiburg, Germany. 2014
- 14th European *Drosophila* Neurobiology Conference (Neurofly), Padua, Italy. 2012 (Plenary)
- EMBO Workshop, Crete, Greece. 2011

Supervision of junior researchers

As a team leader, Stephan Sigrist has played an important role in the early career of several young scientists, many of whom have pursued successful careers as researchers in academic science or in industry. Former graduate students examined under Stephan Sigrist's main supervision who went for an academic career:

- Dr. Robert Kittel*, Leader of an independent research group, Julius-Maximilians-Universität Würzburg, Germany

- Dr. David Owald*, DFG Emmy Noether Group Leader Laboratory, Heidelberg, Germany
- Dr. Manuela Schmidt*, currently: DFG Emmy Noether Group Leader, Max-Planck-Institut für Experimentelle Medizin, Göttingen, Germany
- Former postdocs who worked under his supervision:
 - Carolin Wichmann, Professor (W2) "Molecular architecture of synapses", Medical Faculty Göttingen
 - Dr. M.Sc. Alexander Walter*, currently DFG Emmy Noether Group Leader, Leibniz-Institut für Molekulare Pharmakologie (FMP), Berlin, Germany

* After finishing their PhD or postdoc at the Sigrist lab, these individuals were awarded the most prestigious German funding for young independent researchers ("Emmy Noether Group").

Stephan Sigrist hosted several postdoctoral guest scientists in his lab over the years. Some are recognized leaders in their fields, such as Alexander von Humboldt Fellow Dr. Dave Featherstone (University of Illinois at Chicago, USA) and Einstein Visiting Fellow Cecilia Clementi (Rice University, Houston, USA).