Prof. Dr. rer. nat. Carolin Wichmann

GENERAL INFORMATION

Name:	Carolin Wichmann, née Poc
Date of birth:	18.07.1973
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Address of institution:	Center for Biostructural Imaging of Neurodegeneration (BIN) University Medical Center Göttingen/ Institute for Auditory Neuroscience Molecular Architecture of Synapses Group Von-Siebold-Straße 3a 37075 Göttingen
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Current position:	Professor for "Molecular Ultrastructure of Synapses" at the Institute for Auditory Neuroscience, University Medical Center Göttingen

ACADEMIC EDUCATION

1999 – 2002	Doctoral studies, Institute for Microbiology and Genetics, University of Göttingen (Prof. Dr. F. Mayer)
1993 – 1999	Studies of Biology (Diploma), University of Göttingen

SCIENTIFIC DEGREES

2002	Dr. rer. nat., Institute for Microbiology and Genetics, University of Göttingen (Prof. Dr. F. Mayer)

PROFESSIONAL CAREER AFTER COMPLETING DEGREE

Dec. 2016	W2 Professorship "Molecular Ultrastructure of Synapses" at the Institute for Auditory Neuroscience, University Medical Center Göttingen
2011 - 2016	Group Leader in the InnerEarLab University Medical Center Göttingen (Group: Molecular Architecture of Synapses), Department of Otolaryngology (since January 1st 2015: Institute for Auditory Neuroscience)
2010 – 2011	Research Associate, Freie Universität Berlin (Prof. Dr. Stephan J. Sigrist)
2008 – 2010	Research Associate at the Charité Berlin (Prof. Dr. Stephan J. Sigrist)

2006 – 2008	Research Associate, Bio-Imaging Center, University of Würzburg (Prof. Dr. Stephan J. Sigrist)
2005 – 2006	Research Associate at the Clinical Neurobiology, University of Würzburg (Prof. Dr. Manfred Heckmann/Prof. Dr. Stephan J. Sigrist)
2002 – 2005	Research Associate at the European Neuroscience Institute (ENI), Göttingen (Dr. Stephan J. Sigrist)

PUBLICATIONS

Originalpublications:

1) Strenzke N[#*], Chakrabarti R[*], Al-Moyed H[*], Müller A, Hoch G, Pangrsic T, Yamanbaeva G, Lenz C, Pan K-T, Auge E, Geiss-Friedlander R, Urlaub H, Brose N, **Wichmann C[#]**, Reisinger E[#] **(2016)** Hair cell synaptic dysfunction, auditory fatigue and thermal sensitivity in otoferlin Ile515Thr mutants. **EMBO J** 35, 2519-2535.
2) Vogl C*, Panou I*, Yamanbaeva G*, **Wichmann C*,** Mangosing SJ*, Vilardi F*, Indzhykulian AA*, Pangršič T*, Santarelli R, Rodriguez-Ballesteros M, Weber T, Jung S, Cardenas E, Wu X, Wojcik SM, Kwan KY, Del Castillo I, Schwappach B, Strenzke N, Corey DP, Lin SY, Moser T **(2016)** Tryptophan-rich basic protein (WRB) mediates insertion of the tail-anchored protein otoferlin and is required for hair cell exocytosis and hearing. **EMBO J** 35, 2536-2552.
3) Jung SY*, Maritzen T*, **Wichmann C***, Jing Z, Neef A, Revelo NH, Al-Moyed H, Meese S, Wojcik SM, Panou I, Bulut H, Schu P, Ficner R, Reisinger E, Rizzoli SO, Neef J, Strenzke N, Haucke V & Moser T **(2015).** Disruption of adaptor protein 2µ (AP-2µ) in cochlear hair cells impairs vesicle reloading of synaptic release sites and hearing. **EMBO J**, 34:2686-702
4) Jung S*, Oshima-Takago T*, Chakrabarti R[§], Wong AB[§,], Jing S, Yamanbaeva G, Picher MM, Wojcik SM, Göttfert F, Predoehl F, Michel K, Hell SW, Schoch S, Strenzke N[#] , **Wichmann C[#]**, Moser T[#] **(2015)**. Rab3-interacting molecules 2α and ß (RIM2α and RIM2ß) promote the abundance of voltage gated $Ca_V1.3$ Ca^{2+} channels at hair cell active zones. **PNAS** 112:E3141-9.
5) Vogl C[#], Cooper BH, Neef J, Wojcik SM, Reim K, Reisinger E, Brose N, Rhee JS, Moser T[#], **Wichmann C[#] (2015)**. Unconventional molecular regulation of synaptic vesicle replenishment in cochlear inner hair cells. **J Cell Science**, 128, 638-44.
6) Chapochnikov NM*, Takago H*, Pangrsic T, Khimich D, Neef J, Auge E, Göttfert F, Hell SW, **Wichmann C[#]**, Wolf F[#], Moser T[#] **(2014).** Uniquantal release through a dynamic fusion pore is a candidate mechanism of hair cell excytosis. **Neuron** 83:1389-403.
7) Li L, Tian X, Zhu M, Bulgari D, Böhme MA, Goettfert F, **Wichmann C**, Sigrist SJ, Levitan ES, Wu C **(2014).** Drosophila Syd-1, Liprin-α, and Protein Phosphatase 2A B' Subunit Wrd Function in a Linear Pathway to Prevent Ectopic Accumulation of Synaptic Materials in Distal Axons. **J Neurosci** 34:8474-8.
8) Podufall J, Tian R, Knoche E, Puchkov D, Walter AM, Rosa S, Quentin C, Vukoja A, Jung N, Lampe A, **Wichmann C**, Böhme M, Depner H, Zhang YQ, Schmoranzer J, Sigrist SJ, Haucke V **(2014).** A presynaptic role for the cytomatrix protein GIT in synaptic vesicle recycling. **Cell Rep** 7:1417-25.
9) Mendoza-Schulz A, Jing Z, Sánchez Caro JM, Wetzel F, Dresbach T, Strenzke N[#], **Wichmann C[#],** Moser T[#] **(2014).** Bassoon-disruption slows vesicle replenishment and induces homeostatic plasticity at a CNS synapse. **EMBO J** 33:512-27.
10) Wong AB*, Rutherford MA*, Gabrielaitis M*, Pangršič T, Göttfert F, Frank T, Michanski S, Hell S, Wolf F[#], **Wichmann C[#]**, Moser T[#] (**2014).** Developmental

refinement of hair cell synapses tightens the coupling of Ca^{2+} influx to exocytosis. **EMBO J** 33, 247-64.

11) Neef J, Jung SY, Wong AB, Reuter K, Pangršič T, Chakrabarti R, Kügler S, Lenz C, Nouvian R, RM Boumil, Frankel WN, **Wichmann C**, Moser T **(2014).** Modes and regulation of endocytic membrane retrieval in mouse auditory hair cells. **J Neurosci** 34, 705-16.
12) Matkovic T*, Siebert M*, Knoche E*, Depner H, Mertel S, David Owald, Schmidt M, Thomas U, Sickmann A, Kamin D, Hell SW, Bürger J, Hollmann C, Mielke T, **Wichmann C**[#], Sigrist SJ[#] **(2013).** The Bruchpilot cytomatrix regulates the readily-releasable pool of synaptic vesicles. **J Cell Biol** 202, 667-83.
13) Owald D*, Khorramshahi O*, Gupta VK*, Banovic D, Depner H, Fouquet W, **Wichmann C**, Mertel S, Eimer S, Reynolds E, Holt M, Aberle H, Sigrist SJ **(2012).** Cooperation of Syd-1 with Neurexin synchronizes pre- with postsynaptic assembly. **Nat Neurosci** 15, 1219-26.
14) Liu KSY*, Siebert M*, Mertel S*, Knoche E*, Wegener S*, **Wichmann C**, Matkovic T, Muhammad K, Depner H, Mettke C, Bückers J, Hell SW, Müller M, Davis GW, Schmitz D, Sigrist SJ **(2011)**. RIM-Binding Protein, a Central Part of the Active Zone, Is Essential for Neurotransmitter Release. ***Science*** 334, 1565-1569.
15) Christiansen F*, Zube C*, Andlauer TF, **Wichmann C**, Fouquet W, Owald D, Mertel S, Leiss F, Tavosanis G, Luna AJ, Fiala A, Sigrist SJ **(2011)**. Presynapses in Kenyon cell dendrites in the mushroom body calyx of Drosophila. **J Neurosci** 31:9696-707.
16) Hallermann S*, Kittel RJ*, **Wichmann C***, Weyersmüller A, Fouquet W, Mertel S, Owald D, Eimer S, Depner H, Schwärzel M, Sigrist SJ, Heckmann M **(2010).** Naked dense bodies provoke depression within milliseconds. **J Neurosci** 30,14340-14345.
17) Banovic D*, Korramshahi O*, Owald D, **Wichmann C**, Riedt T, Fouquet W, Tian R, Sigrist SJ, Aberle H **(2010).** Drosophila Neuroligin 1 promotes growth and postsynaptic differentiation at glutamatergic neuromuscular junctions. **Neuron** 66, 724-738.
18) Bachmann A*, Kobler O*, Kittel RJ, **Wichmann C**, Sierralta J, Sigrist SJ, Gundelfinger ED, Knust E, Thomas U **(2010).** A Perisynaptic Ménage à Trois between Dlg, DLin-7, and Metro Controls Proper Organization of Drosophila Synaptic Junctions**. J Neurosci** 30, 5811-5824.
19) Owald D*, Fouquet W*, Schmid M, **Wichmann C,** Mertel S, Depner H, Christiansen F, Zube C, Quentin C, Körner J, Urlaub H, Mechtler K, Sigrist S J **(2010).** A Syd-1 homologue regulates pre- and postsynaptic maturation in Drosophila. **J Cell Biol** 188, 565-579.
20) Fouquet W*, Owald D*, **Wichmann C**, Mertel S, Depner H, Dyba M, Hallermann S, Kittel RJ, Eimer S, Sigrist SJ **(2009).** Maturation of active zone assembly by Drosophila Bruchpilot. **J Cell Biol** 186,129-45.
21) Besse F, Mertel S, Kittel RJ, **Wichmann C**, Rasse TM, Sigrist SJ, Ephrussi A **(2007)**. The Ig cell adhesion molecule Basigin controls compartmentalization and vesicle release at Drosophila melanogaster synapses. **J Cell Biol** 177, 843-55.
22) Schmid A*, Qin G*, **Wichmann C**, Kittel RJ, Mertel S, Fouquet W, Schmidt M, Heckmann M, Sigrist SJ **(2006).** Non-NMDA-type glutamate receptors are essential for maturation but not for initial assembly of synapses at Drosophila neuromuscular junctions. **J Neurosci** 26, 11267-77.
23) Kittel RJ, Hallermann S, Thomsen S, **Wichmann C**, Sigrist SJ, Heckmann M **(2006)**. Active zone assembly and synaptic release. **Biochem Soc Trans** 34, 939-41.
24) Ataman B, Ashley J, Gorczyca M, Mathew D, **Wichmann C**, Sigrist SJ, Budnik V **(2006).** Nuclear trafficking of Drosophila Frizzled-2 during synapse development requires the PDZ protein dGRIP. **PNAS** 103, 7841-7846.
25) Kittel RJ*, **Wichmann C*,** Rasse TM*, Fouquet W, Schmidt M, Schmid A, Wagh DA, Pawlu C, Kellner RR, Willig KI, Hell SW, Buchner E, Heckmann M, Sigrist SJ. **(2006).** Bruchpilot Promotes Active Zone Assembly, Ca^{2+} Channel Clustering, and Vesicle Release. **Science** 312, 1051-4.

26) Wagh DA*, Rasse TM*, Asan E, Hofbauer A, Schwenkert I, Durrbeck H, Buchner S, Dabauvalle MC, Schmidt M, Qin G, **Wichmann C**, Kittel R, Sigrist SJ, Buchner E. **(2006).** Bruchpilot, a protein with homology to ELKS/CAST, is required for structural integrity and function of synaptic active zones in Drosophila. **Neuron** 49, 833-44.
27) Swan LE*****, **Wichmann C***, Prange U, Schmid A, Schmidt M, Schwarz T, Ponimaskin E, Madeo F, Vorbruggen G, Sigrist SJ. **(2004).** A glutamate receptor-interacting protein homolog organizes muscle guidance in Drosophila. **Genes Dev** 18, 223-237.
28) **Wichmann C**, Naumann PT, Spangenberg O, Konrad M, Mayer F, Hoppert M **(2003).** Liposomes for micro-compartmentation of enzymes and their influence on catalytic activity. **Biochem. Biophys. Res. Commun** 310, 1104-1110.
29) Mayer F, Vogt B, **Poc C (1998).** Immunoelectron microscopic studies indicate the existence of a cell shape preserving cytoskeleton in prokaryotes. **Naturwissenschaften** 85, 278-282.

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Reviews:

Wichmann C, Sigrist SJ. **(2010)**. The Active Zone T-Bar-A Plasticity Module? **J Neurogenet** 24, 133-145.

Wichmann C, Moser T **(2015)**. Relating structure and function of inner hair cell ribbon synapses. **Cell & Tissue Research**, special issue: "AUDITORY SYSTEM: DEVELOPMENT, FUNCTION, AGING AND MALFUNCTION". Published online 22. Januar

Wichmann C (2015) Molecularly and structurally distinct synapses mediate reliable encoding and processing of auditory information. **Hear Res** 330:178-90, review.