

**Kusch, Kathrin****Personal Data**

Title	Dr. rer. nat.
First name	Kathrin
Name	Kusch
Current position	Group Leader
Current institution(s)/site(s), country	Institut für Auditorische Neurowissenschaften Universitätsmedizin Göttingen Göttingen, Germany
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**Qualifications and Career**

Stages		Periods and Details
Degree programme	1999 - 2004	Diploma in Human Biology, University of Greifswald, Germany (Dr. S. Engelmann)
	2004 - 2010	Doctoral researcher, Institute for Microbiology, University of Greifswald, Germany (Prof. M. Hecker)
Doctorate	2012	Dr. rer. nat., supervisor: Prof. M. Hecker, "Characterization and regulation of virulence factors in <i>Staphylococcus aureus</i> ", University of Greifswald, Germany
Stages of academic/ professional career	Since 2021	Group Leader, Functional Auditory Genomics Group, Institute for Auditory Neuroscience, University Medical Center Göttingen, Germany
	2020 - 2021	Staff Scientist, Institute for Auditory Neuroscience, University Medical Center Göttingen, Germany
	2011 - 2020	Postdoctoral Fellow, Department of Neurogenetics, Max Planck Institute of Experimental Medicine (MPIEM), Göttingen, Germany

**Engagement in the Research System**

- Since 2024 Representative of Viral Vector Engineering Platform, Else Kröner Fresenius Center for Optogenetic Therapies
- 2019 & 2023 Local Organizing Team of the annual German Neuroscience Society (NWG) conference
- 2016 - 2017 Mentee of the KaWirMento-program, University of Göttingen
- 2015 - 2020 Member of the MPIEM Institutional Animal Care and Use Committee (IACUC) and the MPIEM animal house committee
- 2013 - 2020 Deputy Officer for Equal Opportunities, Max Planck Institute of Experimental Medicine, Göttingen

## Scientific Results

### Category A

1. Cepeda AP, Ninov M, Neef J, Parfentev I, **Kusch K**, Reisinger E, Jahn R, Moser T, Urlaub H (2023) Proteomic analysis reveals the composition of glutamatergic organelles of auditory inner hair cells. *Mol Cell Proteomics* 23(2):100704. doi: [10.1016/j.mcpro.2023.100704](https://doi.org/10.1016/j.mcpro.2023.100704) (OA)  
*Contribution:* Data analysis, review and editing of manuscript.  
*Significance:* Collaboration with Moser and Urlaub labs analysing the molecular architecture of the inner hair cell synapse.
2. Chen H, Monga M, Fang Q, Slitin L, Neef J, Chepurwar SS, Mingroni Netto RC, Lezirovitz K, Tabith A Jr, Benseler F, Brose N, **Kusch K**, Wichmann C, Strenzke N, Vona B, Preobraschenski J, Moser T (2023) Ca<sup>2+</sup>-binding to the C2E domain of otoferlin is required for hair cell exocytosis and hearing. *Protein Cell* 8:pwad058. doi: [10.1093/procel/pwad058](https://doi.org/10.1093/procel/pwad058) (OA)  
*Contribution:* Data acquisition, data analysis.  
*Significance:* Collaboration with Brose, Wichmann, Strenzke, Moser, Vona and Prebraschenski labs utilizing combined analyses for functional characterization of otoferlin C2E domain in Ca<sup>2+</sup> sensing.
3. Wolf BJ\*, **Kusch K\***, Hunniford V, Vona B, Kühler R, Keppeler D, Strenzke N, Moser T (2022) Is there an unmet medical need for improved hearing restoration? *EMBO Mol Med* e15798. doi: [10.15252/emmm.202215798](https://doi.org/10.15252/emmm.202215798) (OA)  
*Significance:* Collaborative review identifying limits and requirements in hearing restoration of patients.
4. Bali B, Gruber-Dujardin E, **Kusch K**, Rankovic V, Moser T (2022) Analyzing efficacy, stability, and safety of AAV-mediated optogenetic hearing restoration in mice. *Life Sci Alliance* 5:e202101338. doi: [10.26508/lsa.202101338](https://doi.org/10.26508/lsa.202101338) (OA)  
*Contribution:* Data acquisition, data analysis, edited manuscript.  
*Significance:* Collaboration with Moser lab validating long term biosafety of inner ear gene therapy in inner ear of mice.
5. Jablonska B, Adams KL, Kratimenos P, Li Z, Strickland E, Haydar TF, **Kusch K**, Nave KA, Gallo V (2022) Sirt2 promotes white matter oligodendrogenesis during development and in models of neonatal hypoxia. *Nat Commun* 13(1):4771. doi: [10.1038/s41467-022-32462-2](https://doi.org/10.1038/s41467-022-32462-2) (OA)  
*Contribution:* Generation of mouse model.  
*Significance:* Collaboration with Nave and Gallo labs untangling complex sirtuin 2 functions in CNS by conditional knockout mice.
6. Meschkat M, Steyer AM, Weil MT, **Kusch K**, Jahn O, Piepkorn L, Agüi Gonzalez P, Phan NTN, Ruhwedel T, Sadowski B, Rizzoli SO, Werner HB, Ehrenreich H, Nave KA, Möbius W (2022) White matter integrity requires continuous myelin synthesis at the inner tongue in mice. *Nat Commun* 13:1163. doi: [10.1038/s41467-022-28720-y](https://doi.org/10.1038/s41467-022-28720-y) (OA)  
*Contribution:* Conceptualization, experimental supervision, experimental design, data acquisition, data analysis, edited manuscript.  
*Significance:* Mechanistical insight in long term maintenance of CNS myelin by collaborative multiscale efforts with Möbius, Werner, Jahn, Ehrenreich, Rizzoli and Nave labs.
7. Rankovic V, Vogl C, Dörje NM, Bahader I, Duque Afonso CJ, Thirumalai A, Weber T, **Kusch K**, Strenzke N, Moser T (2021) Overloaded adeno-associated virus as a novel gene therapeutic tool for otoferlin-related deafness. *Front Mol Neurosci* 13:600051. doi: [10.3389/fnmol.2020.600051](https://doi.org/10.3389/fnmol.2020.600051) (OA)  
*Contribution:* Data acquisition, data analysis, edited manuscript.

*Significance: Collaboration with Strenzke and Moser labs to prove feasibility of a single vector approach for otoferlin gene therapy.*

8. Trevisiol A\*, **Kusch K\***, Steyer AM, Gregor I, Nardis C, Winkler U, Köhler S, Restrepo A, Möbius W, Werner HB, Nave KA, Hirrlinger J (2020) Structural myelin defects are associated with low axonal ATP levels but rapid recovery from energy deprivation in a mouse model of spastic paraplegia. *PLoS Biol* 18(11):e3000943. doi: [10.1371/journal.pbio.3000943](https://doi.org/10.1371/journal.pbio.3000943) **(OA)**  
*Significance: A main project from my time with the Nave lab. In collaboration with Möbius, Werner and Hirrlinger labs we identified functional consequences of a mutation modeling leucodystrophy.*
9. Moore S, Meschkat M, Ruhwedel T, Trevisiol A, Tzvetanova ID, Bettefeld A, **Kusch K**, Kole MHP, Strenzke N, Möbius W, de Hoz L, Nave KA (2020) A role of oligodendrocytes in information processing. *Nat Commun* 11(1):5497. doi: [10.1038/s41467-020-19152-7](https://doi.org/10.1038/s41467-020-19152-7) **(OA)**  
*Contribution: Experimental design, data acquisition, data analysis, edited manuscript*  
*Significance: Collaboration with de Hoz, Möbius, Nave and Strenzke labs analysing the impact of white matter disorders on function of the auditory pathway.*
10. **Kusch K**, Uecker M, Liepold T, Möbius W, Hoffmann C, Neumann H, Werner HB, Jahn O (2017) Partial immunoblotting of 2D-gels: a novel method to identify post-translationally modified proteins exemplified for the myelin acetylome. *Proteomes* 5(1). doi: [10.3390/proteomes5010003](https://doi.org/10.3390/proteomes5010003) **(OA)**  
*Significance: Pioneering work establishing a platform for identification of posttranslational modifications paving the way for later de-novo identification of sirtuin 2 functions (manuscript in preparation). Project was developed in close collaboration with Jahn lab.*

\*Equal contribution.

**(OA):** Publicly available (e.g. open access, open archive, preprint, free access, etc.).

### Academic Distinctions

2004 - 2008     Fellow of the Research Training Group GRK840, German Research Foundation (DFG), University of Greifswald, Germany