

## Professional experience

---

- 08/2018 - present      Emmy Noether group leader at the department of Molecular and Cellular Neuroscience and Buchmann Institute for Molecular Life Sciences, Goethe University Frankfurt, Germany
- Characterisation of comorbidity mouse models with a focus on pericytes.
  - Building and establishing *in vivo* 2-Photon imaging setup (custom made).
  - *In vivo* 2 Photon imaging, primary cell culture and single cell RNA sequencing during the comorbid state of Alzheimer's Disease and vascular cognitive impairment.
- 03/2016 - 08/2018      Postdoctoral Research Fellow department of Molecular and Cellular Neuroscience and Buchmann Institute for Molecular Life Sciences, Goethe University Frankfurt, Germany
- DFG return stipend to re-integrate into German research landscape.
  - Preparation of Emmy Noether proposal.
  - Establishing comorbidity models of Alzheimer's Disease and vascular cognitive impairment.
  - Establishing *in vivo* 2-Photon imaging setup (adapted Leica SP8).
- 03/2015 - 10/2015      Maternity leave
- 02/2013 - 03/2016      Postdoctoral Research Fellow at Djavad Mowafaghian Centre for Brain Health, University of British Columbia, Canada:
- Responsible for planning, experimentation and analysis of project: "Mapping synaptic glutamate transporter dysfunction *in vivo* to regions surrounding A $\beta$  plaques by iGluSnFR Two-Photon imaging".
  - Responsible for planning, experimentation and analysis of project: "A role for brain pericytes in cerebrovascular regeneration after stroke."
  - Responsible for the area of *in vivo* imaging and analysis in the following collaborative research projects:
    1. "Activation of neuronal NMDA receptors triggers transient ATP-mediated microglial process outgrowth."
    2. "Microglia rapidly adopt a filopodia-rich phenotype upon oxygen depletion by sensing tissue acidosis."
  - Supervision of 2 technical assistants.
  - Supervision of student part time assistant

- Teaching within the program: “Undergraduate Research Opportunities.”

12/2011 - 02/2013

Postdoctoral Research Fellow at Hertie-Institute for Clinical Brain Research, University Tübingen, Germany:

- Responsible for planning, experimentation and analysis of the projects:
  1. “Homeostatic and injury-induced microglia behavior in the aging brain”.
  2. “Microglia turnover with aging and in an Alzheimer’s model via long-term *in vivo* single-cell imaging”.
- Leadership of *in vivo* experiments and immunohistochemical analysis in an international Collaboration: Comment on “ApoE-Directed Therapeutics Rapidly Clear  $\beta$ - Amyloid and Reverse Deficits in AD Mouse Models.”
- Teaching complex surgical methods on rodent brains to master and PhD students.
- Supervision of student part time assistant.
- Supervision of PhD student.

12/2008 - 12/2011

PhD student at the Hertie-Institute for Clinical Brain Research, University Tübingen, Germany:

- Responsible for planning, experimentation and analysis of the projects: “Long-term *in vivo* 2-photon imaging of Alzheimer’s Disease and associated Microglia reactions.”
- Responsible for planning, experimentation and analysis of the projects: “Repeatable target localization for long-term *in vivo* imaging of mice with multiphoton microscopy.”
- „Modeling familial Danish dementia in mice supports the concept of the amyloid hypothesis of Alzheimer's disease. “
- Supervision of student part time assistant.
- Supervision of PhD student.
- Teaching of Master students during lab rotations.

03/2008 - 12/2008

Student assistant at the Wolfson Institute of Biomedical Research, Neural Computation, University College London, England:

- Establishing and scientific experimentation in project: „Short-term research project “Recall of learned behaviour driven by optical stimulation of functionally defined neuronal subpopulations”

10/2001 - 10/2003

Chemical laboratory assistant at the Institute for Human Genetics, University Essen-Duisburg, Essen, Deutschland:

- Manager of university DNA sequencing service.
- Experimental design, performance and analysis of DNA sequencing.
- Customer and analysis support.

03/2004 - 10/2007

Part time student worker at biomers.net, Ulm, Deutschland:

- Customer support and acquisition

## Education

---

|                     |   |
|---------------------|---|
| 12/2007 - 12/2008   | Diploma thesis at the Institute for Neurobiology in Collaboration with the Institute of Anatomy and Cell biology, University Ulm, Germany: <ul style="list-style-type: none"><li>Responsible for planning, experimentation and analysis of the projects: “Plasticity-associated protein expression in mice induced by maternal behaviour “.</li></ul> |
| 10/2003 - 10/2007   | Completed studies of biology with a major in neuroscience at the university in Ulm, Germany.<br>Parallel studies of Philosophy at the university in Ulm, Germany.   |
| 09/ 1998 - 09/ 2001 | Completed apprenticeship of chemical laboratory assistant at the Institute of Immunology at the university of Freiburg, Germany.  |
| 1998                | Abitur at the Gymnasium in Lahr, Germany.   |

## Awards and Honors

---

|                   |   |
|-------------------|---|
| 02/2019 - present | Member of the Interdisciplinary Centre for Neuroscience, Frankfurt  |
| 12/2018 - present | Member of the Early Research Council, Goethe University, Frankfurt  |
| 09/2018 - present | Member of the Johanna Quandt Young Academy at Goethe University Frankfurt   |
| 04/2019 - present | Principal Investigator in Forschergruppe 2325 – Neurovascular Interactions, Goethe University, Frankfurt.   |
| 10/2018 - present | Faculty member of Excellence Cluster “Cardio Pulmonary Institute”, Goethe University, Frankfurt.  |
| 02/2018 - present | Emmy Noether Award, Deutsche Forschungs Gesellschaft<br>Department of Molecular and Cellular Neuroscience, Buchmann Institute for Molecular Life Science, Goethe University Frankfurt.                                    |
| 09/2017 - present | Alzheimer's Association, Alzheimer's Association Research Fellowship<br>Department of Molecular and Cellular Neuroscience, Buchmann Institute for Molecular Life Science, Goethe University Frankfurt.                    |
| 09/2015 - 09/2017 | Michael Smith Foundation for Health Research (MSFHR)/The Pacific Alzheimer Research Foundation (PARF) Post-Doctoral Fellowship Partner Award, Djavad Mowafaghian Centre for Brain Health, University of British Columbia. |
| 03/2013 - 08/2016 | DFG Postdoctoral Fellowship award, Djavad Mowafaghian Centre for Brain Health, University of British Columbia   |
| 01/2014 - 03/2016 | GAIN (German Academic International Network) coordinator, Vancouver, Canada   |

|                   |   |
|-------------------|---|
| 06/2010           | Invitation and travel award to the Nobel laureate meeting, Lindau.  |
| 12/2008 - 12/2011 | PhD award from the charitable Hertie Foundation, Hertie-Institute for Clinical Brain Research, University Tübingen. |
| 2010-2011         | Elected student representative, Graduate School of Cellular & Molecular Neuroscience, University Tübingen.          |
| 07/2010           | Representative of the charitable Hertie Foundation at the FENS, Amsterdam   |

## Publication list

---

|   |  |
|---|--|
| 2019 Annual Review of Cell and Developmental Biology (in press) | Neurovascular interaction in the nervous system, Volume 35, M. Segarra, M. R. Aburto, J.K Hefendehl and A. Acker-Palmer  |
| 2019 Methods in Molecular Biology (in press)                    | Bookchapter: Long-term in vivo imaging of individual microglia cells. A.A. Skodras, J.K. Hefendehl and J.J. Neher  |
| 2019 Cell Reports   | Nanoscale Surveillance of the Brain by Microglia via cAMP-Regulated Filopodia. Bernier L.P., Bohlen C.J., York E.M., Choi H.B., Kamyabi A., Dissing-Olesen L., Hefendehl J.K., Collins H.Y., Stevens B., Barres B.A., MacVicar B.A. Cell Rep. 2019 Jun 4; doi: 10.1016/j.celrep.2019.05.010                    |
| 2017 Nature Neuroscience  | Longevity of microglia revealed by long-term in vivo imaging of individual cells. P. Fügen, J.K. Hefendehl, C. Schlosser, A.C.Wendeln, U.Obermüller, J.J.Neher, P. Martus, S. Kohsaka, S. Sisodia, M. Thunemann, R. Feil, A. Skodras, M.Jucker, Nature Neurosci 28 August 2017; doi:10.1038/nn.4631            |
| 2016 Nature communications                                      | Mapping synaptic glutamate transporter dysfunction in vivo to regions surrounding A $\beta$ plaques by iGluSnFR Two- Photon imaging. JK. Hefendehl, J. LeDue, R. Ko, T. Murphy, B.A. MacVicar. Nature Comm 7:13441   DOI: 10.1038  |
| 2014 Journal of Neuroscience                                    | Activation of neuronal NMDA receptors triggers transient ATP-mediated microglial process outgrowth. Dissing-Olesen L, LeDue J, Rungta R, Hefendehl JK, Choi H, and MacVicar B. J Neurosci. 2014, JN-RM-0405-14R1   |
| 2013 Aging Cell   | Homeostatic and injury-induced microglia behavior in the aging brain. Hefendehl JK, Neher JJ, Sühs RB, Kohsaka S, Skodras A, and Jucker M. Aging Cell 2013 Aug 16; pp1–10  |
| 2013 Science  | Comment on “ApoE-Directed Therapeutics Rapidly Clear b-Amyloid and Reverse Deficits in AD Mouse Models”. Veeraghavulu K,* Zhang C,* Miller S,* Hefendehl JK,* Rajapaksha TW,* Ulrich J,* Jucker M, Holtzman DM, Tanzi RE, Vassar R, Sisodia SS. (shared first authorship). Science 2013 Jan 22 340, 924 (2013) |

|                                      |   |
|--------------------------------------|---|
| 2011 Journal of Neuroscience         | Long-term in vivo Imaging of $\beta$ -Amyloid Plaque Appearance and Growth in a Mouse Model of Cerebral $\beta$ -Amyloidosis. Hefendehl JK*, Wegenast-Braun BM*, Liebig C, Eicke D, Milford D, Calhoun ME, Eichner M, Jucker M.. J Neurosci. 2011 Jan 12;31(2):624-9.   |
| 2011 Journal of Neuroscience Methods | Repeatable target localization for long-term in vivo imaging of mice with multiphoton microscopy. J.K. Hefendehl, Milford D.K., Eicke D., Grathwohl S.A., Wegenast-Braun B.M., Calhoun M.E., Jucker M., and Liebig C. Journal of Neuroscience Methods, 205 (2011) 357-363.  |
| 2010 PNAS                            | Modeling familial Danish dementia in mice supports the concept of the amyloid hypothesis of Alzheimer's disease. Coomaraswamy J, Kilger E, Wölfling H, Schäfer C, Kaeser SA, Wegenast-Braun BM, Hefendehl JK, Wolburg H, Mazzella M, Ghiso J, Goedert M, Akiyama H, Garcia-Sierra F, Wolfer DP, Mathews PM, Jucker M. PNAS 2010 Apr 27;107(17):7969-74. |

## Teaching

---

|  |   |
|--|---|
| 2019 Summer semester<br>Goethe University                | 2 master modules in Neuroscience (Interdisciplinary Neuroscience and Physical Biology of Cells and Cell interactions) <ul style="list-style-type: none"> <li>“Cellular and molecular mechanisms in Alzheimer’s Disease and stroke”</li> </ul> |
| 2018 Winter semester<br>Goethe University                | Lecture and course in master module for light microscopy and model systems. <ul style="list-style-type: none"> <li>“Principles of conventional and multiphoton microscopy – image acquisition and analysis”</li> </ul>                        |
| 2015 Winter semester<br>UBC                              | Research experience program: <ul style="list-style-type: none"> <li>Multidisciplinary Undergraduate Research Lectures – Basic Neuroscience.</li> </ul>  |
| 2009/2010 Winter semester<br>University Tübingen         | Laboratory rotation of master students: <ul style="list-style-type: none"> <li>Supervision, guidance and evaluation of master students in a 10-week laboratory course on 2-photon microscopy in neurodegenerative diseases.</li> </ul>        |
| 2004/2005/2006/2007<br>Winter semester<br>University Ulm | Teaching in basic neuroscience: <ul style="list-style-type: none"> <li>“Advanced methods in Neurobiology”,</li> <li>„Structures of the vertebrate brain “.</li> </ul>   |

## Other teaching activities

|           |  |
|-----------|--|
| 2016-2019 | Pre-school kids’ day – hands on experiments for 5-6-year-old children in the areas of zoology, neuroscience, physics and microscopy. |
|-----------|--|

## **Soft Skills Courses**

|                      |   |
|----------------------|---|
| Winter semester 2015 | Scientist Knowledge Translation Training<br>UBC, Vancouver  |
| Winter semester 2011 | Negotiation and Conflict Resolution in Science<br>Graduate School of Cellular & Molecular Neuroscience, University Tübingen |
| Summer semester 2011 | Scientific Presentation<br>Graduate School of Cellular & Molecular Neuroscience, University Tübingen                        |
| Winter semester 2010 | Leadership and Management skills<br>Graduate School of Cellular & Molecular Neuroscience, University Tübingen               |
| Winter semester 2009 | Time management in Science<br>Graduate School of Cellular & Molecular Neuroscience, University Tübingen                     |