Rui Wang, M.Sc.

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Skills

Microscopy two-photon microscopy, confocal microscopy, transmission electron microscopy/electron tomography
Electrophysiology whole-cell patch-clamp, optogenetics, single-cell electroporation
Cell culture and animal experiments organotypic slice culture, virus transfection, animal surgery for transplantation
Molecular biology qPCR, immunohistochemistry, western blot, RNAscope, RNAseq

Programming MATLAB, Python (NumPy, SchPy, matplotlib).
Data Processing GraphPad Prism, ImageJ, Napari, Imaris, IMOD.
Presentation Adobe Illustrator, Powerpoint, LaTex.
Language English (IELTS 7.5), German (A2), Mandarin (Native).

Research Experience

PhD student supervised by Prof. Dr.Thomas Oertner — Aug 2019 – Dec 2024
Institute of Synaptic Physiology, Center for Molecular Neurobiology Hamburg. — Hamburg, DE

- Designed new synapse-specific electron microscopy labeling methods and Electron Microscopy/ Tomography data analysis pipeline.
- Implemented all-optical experimental procedures for investigating the mechanism of spike-timing-dependent synaptic plasticity; Designed MATLAB scripts for electrophysiology data analysis.
- Developed and optimized two-photon chronic imaging equipment, and designed MATLAB toolkits for large-scale time-lapse spine tracking data analysis.
- Supervised one master student.
- Delivered regular institute internal presentations and external presentations at international conferences.

Research Assistant — Jan 2017 – Jun 2019
Neuroscience, Physiology and Pharmacology, University College London. — London, UK

- Management of seven Alzheimer's disease rodent models for aging research.
- Collected bulk RNAseq samples and assisted in data analysis and visualization; collected data for publications.
- Supervised one master student.

MSc Student supervised by Prof. Dr. Frances Edwards, Dr. Dervis Salih — Jan 2017 – Jun 2019
Neuroscience, Physiology and Pharmacology, University College London. — London, UK

- Used immunohistochemistry, qPCR, and RNAscope methods to characterize a novel Alzheimer's disease model.
- Presented data to other scientific departments and at an international conference; integrated results for publications.

BSc Student supervised by Dr. Lei Zhang — Jan 2017 – Jun 2019
Blood Diseases Hospital, Chinese Academy of Medical Sciences — Tianjin, CN

- Used rodent surgery method and immunohistochemistry to evaluate an iPSC-based hemophilia B treatment strategy.

Education

PhD in Neuroscience — Aug 2019 – Dec 2024
Institute of Synaptic Physiology, Center for Molecular Neurobiology Hamburg
Thesis: All-optical investigation of the role of CaMKII in long-term plasticity in the hippocampus and the development of a method for ultrastructural analysis of synapses.

MSc in Neuroscience — Jan 2017 – Jun 2019
University College London (2:1 honors degree, Merit)
Thesis: A Characterisation of the effect of urinary tract infection on Alzheimer's disease pathology progression.

BSc in Biosciences — Jan 2017 – Jun 2019
Wuhan University (Major 89.6/100)
Thesis: An evaluation of the efficiency of a novel Haemophilia B treatment strategy.

Additional Education

Strategy Management and Formulation Coursera, Copenhagen Business School, 2022, ~30hours.
Computational Neuroscience Coursera, Washington University, 2022, ~30hours
18.06 Linear Algebra and **Highlights of Calculus** MIT OpenCourseWare, 2021, ~40 hours
Python I- IIII Coursera, University of Michigan, 2020 – 2021, ~100 hours.
Bioinformatic Methods I II Coursera, University of Toronto, 2020, ~40 hours.

Conference Contribution

Oral presentation

2025: Göettingen Meeting of the German Neuroscience Society, Göettingen.

2024: Society of Neuroscience Conference, Washington D.C: SfN.

2022: DFG Research Unit FOR 2419 Symposium, Hamburg.

2021: DFG Research Unit FOR 2419 PhD Seminar, Hamburg.

2018: Review of the multicentre study of the TgF344-AD model symposium, Manchester.

Poster

2025: Göettingen Meeting of the German Neuroscience Society 2025, Göettingen.

2024: Blankenese Conference 2024, Hamburg.
2023: EMBL Symposium: Seeing is believing 2023, Heidelburg.
2023: Meeting of the German Neuroscience Society, Gottingen.
2022: The FENS Forum Neuroscience, Paris.
2022: Unit FOR 2419 Symposium, Hamburg.
2018: Society of Neuroscience Conference, San. Diego.

Publications

Anisimova M, van Bommel B, **Wang R**, Mikhaylova M, Wiegert JS, Oertner TG, Gee CE. Spike-timing-dependent plasticity rewards synchrony rather than causality. Cereb Cortex. 2022 Dec 15;33(1):23-34. doi: 10.1093/cercor/bhac050. PMID: 35203089; PMCID: PMC9758582.

Benitez DP, Jiang S, Wood J, **Wang R**, Hall CM, Peerboom C, Wong N, Stringer KM, Vitanova KS, Smith VC, Joshi D, Saito T, Saido TC, Hardy J, Hanrieder J, De Strooper B, Salih DA, Tripathi T, Edwards FA, Cummings DM. Knock-in models related to Alzheimer's disease: synaptic transmission, plaques and the role of microglia. Mol Neurodegener. 2021 Jul 15;16(1):47. doi: 10.1186/s13024-021-00457-0.

Chaney AM, Lopez-Picon FR, Serrière S, **Wang R**, Bochicchio D, Webb SD, Vandesquille M, Harte MK, Georgiadou C, Lawrence C, Busson J, Vercouillie J, Tauber C, Buron F, Routier S, Reekie T, Snellman A, Kassiou M, Rokka J, Davies KE, Rinne JO, Salih DA, Edwards FA, Orton LD, Williams SR, Chalon S, Boutin H. Prodromal neuroinflammatory, cholinergic and metabolite dysfunction detected by PET and MRS in the TgF344-AD transgenic rat model of AD: a collaborative multi-modal study. Theranostics 2021; 11(14):6644-6667. doi:10.7150/thno.56059.

Liu W, Taso O, **Wang R**, Bayram S, Graham AC, Garcia-Reitboeck P, Mallach A, Andrews WD, Piers TM, Botia JA, Pocock JM, Cummings DM, Hardy J, Edwards FA, Salih DA. Trem2 promotes anti-inflammatory responses in microglia and is suppressed under pro-inflammatory conditions. Hum Mol Genet. 2020 Nov 25;29(19):3224-3248. doi: 10.1093/hmg/ddaa209.

Medawar E, Benway TA, Liu W, Hanan TA, Haslehurst P, James OT, Yap K, Muessig L, Moroni F, Nahaboo Solim MA, Baidildinova G, **Wang R**, Richardson JC, Cacucci F, Salih DA, Cummings DM, Edwards FA. Effects of rising amyloidβ levels on hippocampal synaptic transmission, microglial response and cognition in APPSwe/PSEN1M146V transgenic mice. EBioMedicine. 2019 Jan;39:422-435. doi: 10.1016/j.ebiom.2018.12.006. Epub 2018 Dec 13. PMID: 30555043; PMCID: PMC6354711.

Lyu C, Shen J, **Wang R**, Gu H, Zhang J, Xue F, Liu X, Liu W, Fu R, Zhang L, Li H, Zhang X, Cheng T, Yang R, Zhang L. Targeted genome engineering in human induced pluripotent stem cells from patients with hemophilia B using the CRISPR-Cas9 system. Stem Cell Res Ther. 2018 Apr 6;9(1):92. doi: 10.1186/s13287-018-0839-8.

Teaching

- University of Hamburg, Master Student Supervision. 2024.
- University of Hamburg, MSc Molecular Life Science, practice module: patch-clamp. 2022.
- University College London, Master Student Supervision. 2018.

Grants and Awards

- Selected for short talk, German Neuroscience Society (NWG), Göettingen, DE, 2025.
- Selected for short talk, Society of Neuroscience Conference, Washington D.C, 2024.
- UCL-ARUK Travel Award, London, UK, 2018.
- Undergraduate Scientific Research Program Grant, Wuhan, CN, 2014-2015.
- The Excellent Student and Merit Student Awards, 2013, 2014.