

**BIOGRAPHICAL SKETCH**

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NAME: Neuberger, Arthur

eRA COMMONS USER NAME (credential, e.g., agency login): NEUBERGER

POSITION TITLE: Postdoctoral Research Scientist

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
University of Würzburg, Germany	BSc	10/2012	Business Management & Economics
University of Würzburg, Germany	Diplom	09/2013	Biology
University of Cambridge, UK	MPhil	07/2014	Management Science & Operations
University of Cambridge, UK	PhD	02/2019	Pharmacology & Biochemistry

**A. Personal Statement**

My research mission is to use cryo-electron microscopy in combination with biophysical methods to study the structure and function of membrane proteins involved in human health and disease. In my PhD at the University of Cambridge, I examined the structure and function of bacterial multidrug efflux pumps, which play a central role in the global spread of antibiotic resistance. Following a brief postdoctoral appointment at the Rockefeller University, where I used cryo-electron microscopy for a structural investigation of Huntingtin, I became interested in studying transient receptor potential (TRP) channels and joined the Sobolevsky lab. TRPs constitute a super-family of cation permeable ion channels that act as transducers of sensory modalities, incl. temperature, taste, olfaction, vision, hearing and touch. Malfunction of TRP channels such as TRPV6 are associated with numerous human diseases, including cancer.

**B. Positions and Honors****Positions and Employment**

2016 Visiting Junior Fellow (Murakami lab), Tokyo Institute of Technology, Japan  
 2019 – 2020 Postdoctoral Research Associate (Walz lab), The Rockefeller University, New York, USA.  
 since 01/2020 Postdoctoral Research Scientist (Sobolevsky lab), Columbia University Irving Medical Center, NY, USA

**Honors**

2011 **Deutschlandstipendium**, awarded by the Federal Ministry for Education and Research to the Top 8% of students in Germany.  
 2011 – '13 **Dean's List 2011/2012 und 2012/2013**, awarded to the Top 3% of BSc students at the Faculty of Business Management & Economics, University of Würzburg.  
 2013 **LyondellBasell Cambridge Scholarship**, awarded by the Cambridge Judge Business School – covering maintenance during MPhil studies (2013 – 2017).  
 2013 **The Economic and Social Research Council (ESRC) Scholarship**, awarded on recommendation from the faculty of the Cambridge Judge Business School (university & college fees for MPhil studies).  
 2014 **Cambridge European Scholarship**, awarded on recommendation from the Department of Pharmacology, University of Cambridge (Honorary Cambridge European Scholar).  
 2014 **The Herchel Smith Scholarship**, awarded on recommendation from the Department of Pharmacology, University of Cambridge (maintenance, university & college fees for PhD).

- 2015 **1st prize for poster presentation** at the Antibiotic Resistance Mechanisms Meeting, 26–27 Nov. 2015, British Society for Antimicrobial Chemotherapy & The Royal Society of Chemistry, Birmingham, UK.
- 2016 **Finalist** at SET for Britain 2016. Abstract & poster selected by expert jury from several hundred applications for presentation to the UK Parliament House of Commons, London, UK.
- 2016 **Selected by the Master of Jesus College Cambridge** for a private presentation to HRH Prince Edward, Earl of Wessex, Jesus College Cambridge on 6 May 2016, Cambridge, UK.
- 2016 **Sir Robbie Jennings Fund**, awarded by Jesus College Cambridge, sponsoring a junior visiting fellowship position at Tokyo Institute of Technology (Murakami lab), Japan, 2016.
- 2017 **CBMNet Early Career Researcher Grant**, awarded to attend the Gordon Research Conference & Seminar on "Multi Drug Efflux Systems", Galveston, TX, USA, March 2017.
- 2017 **Best oral presentation**, 1st prize, at the Gordon Research Seminar on Multi-Drug Efflux Systems, Galveston, TX, USA, March 2017.
- 2017 **Selected as delegate** to the Global Challenges Research Fund (Research Councils UK) "Global Engagement Meeting, New Delhi, India, 6–9 November 2017.
- 2021 **Walter Benjamin Fellowship**, awarded by the German Research Foundation (peer-reviewed funding proposal).

## C. Publications

I have a broad background in biochemistry with specific training and expertise in molecular pharmacology, cryo-electron microscopy, and biophysical methods of membrane protein characterization:

- a. Nadezhdin, K.D.\*, Neuberger, A.\*, Trofimov, Y.A., Krylov, N.A., Sinica, V., Kupko, N., Vlachova, V., Zakharian, E., Efremov, R.G., Sobolevsky, A.I. (2021). Structural mechanism of heat-induced opening of a temperature-sensitive TRP channel. Accepted for publication in **Nature Structural & Molecular Biology**. *\*equally contributing first-authors*
- b. Neuberger, A.\*, Nadezhdin, K.D.\*, Sobolevsky, A.I. (2021). TRPV3 Expression and Purification for Structure Determination by Cryo-EM. Accepted for publication in **Methods in Enzymology**, ISSN 0076-6879 (in Press). DOI: <https://doi.org/10.1016/bs.mie.2021.02.006>. *\*equally contributing first-authors*
- c. Nadezhdin, K.D.\*, Neuberger, A.\*, Nikolaev, Y.A., Murphy, L.A., Gracheva, E.O., Bagriantsev, S.N., Sobolevsky, A.I. (2021). Extracellular cap domain is an essential component of the TRPV1 gating mechanism. **Nature Communications**. 2021;12: 2154. DOI: <https://doi.org/10.1038/s41467-021-22507-3>. Article featured in Nature Communications Editors' Highlights. *\*equally contributing first-authors*
- d. Bhardwaj, R.\*, Lindinger, S.\*, Neuberger, A.\*, Nadezhdin, K.D.\*, Singh, A.K., Cunha, M.R., Derler, I., Gyimesi, G., Reymond, J.L., Hediger, M.A., Romanin, C., Sobolevsky, A.I. (2020). Inactivation- mimicking block of the epithelial calcium channel TRPV6. **Science Advances**. 2020;6(48):eabe1508. *\*equally contributing first-authors*
- e. Du, D.\*, Neuberger, A.\*, Orr, M.W.\*, Newman, C.E.\*, Hsu, P.C., Samsudin, F., Szewczak-Harris, A., Ramos, L.M., Debela, M., Khalid, S., Storz, G. (2020). Interactions of a bacterial RND transporter with a transmembrane small protein in a lipid environment. **Structure**. 2020;28(6):625-34.e6. *\*equally contributing first-authors*
- f. Du, D., Wang-Kan, X., Neuberger, A., van Veen, H.W., Pos, K.M., Piddock, L.J., Luisi, B.F. (2018). Multidrug efflux pumps: structure, function and regulation. **Nature Reviews Microbiology**. 2018;16(9):523- 39.
- g. Neuberger, A., Du, D., Luisi, B.F. (2018). Structure and mechanism of bacterial tripartite efflux pumps. **Research in Microbiology**. 2018;169(7):401-13.
- h. Okada, U., Yamashita, E., Neuberger, A., Morimoto, M., van Veen, H.W., Murakami, S. (2017). Crystal structure of tripartite-type ABC transporter MacB from *Acinetobacter baumannii*. **Nature Communications**. 2017;8(1):1336.

- i. Fitzpatrick, A.W.P., Llabrés, L., Neuberger, A., Blaza, J. N., Bai, X.C., Okada, U., Murakami, S., van Veen H.W., Zachariae, U., Scheres S.H.W., Luisi, B.F., and Du, D. (2017). Structure of the MacAB-TolC ABC-type tripartite multidrug efflux pump. **Nature Microbiology**. 2017;2(7):17070.
- j. Nair, A.V., Singh, H., Raturi, S., Neuberger, A., Tong, Z., Ding, N., Agboh, K., van Veen, H.W. (2016). Relocation of active site carboxylates in major facilitator superfamily multidrug transporter LmrP reveals plasticity in proton interactions. **Scientific Reports**. 2016;6(1):38052.
- k. Neuberger, A., van Veen, H.W. (2015). Hoechst 33342 Is a Hidden "Janus" amongst Substrates for the Multidrug Efflux Pump LmrP. **PloS One**. 2015;10(11):e0141991.
- l. Neuberger, A., Oraopoulos, N., Drakeman, D.L. (2018). Renovation as innovation: is repurposing the future of drug discovery research? **Drug Discovery Today**. 2019;24(1):1-3.
- m. Neuberger A., Oraopoulos N., Drakeman D.L. (2017). Lemons, or Squeezed for Resources? Information Symmetry and Asymmetric Resources in Biotechnology. **Frontiers in Pharmacology**. 2017;8(338).