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Appointments

2021 - present

Principal Investigator of Membrane Protein Structural and Chemical Biology
Centre for Medicines Discovery - Nuffield Department of Medicine
The University of Oxford

Education

2012 **Ph.D. in Molecular Biophysics**, University of Texas Southwestern Medical Center
Advisor: Youxing Jiang, Ph.D.

Dissertation: Protein Structure and Ion Binding in Potassium Selective Channels

2005 **B.S. in Chemistry** (ACS, Honors Degree), Purdue University

Advisor: Jennifer Hovis, Ph.D.

Honors Thesis: Effect of Micelle Forming Lipids on Membrane Stability

Research Experience

2012 - 2021

Postdoctoral Fellow, New York University School of Medicine - Skirball Institute
Mentor: Professor Da-Neng Wang

2006 - 2012

Graduate Research Assistant, UT Southwestern Medical Center – Dept. of Physiology
Advisor: Professor Youxing Jiang

2003 - 2005

Undergraduate Research Assistant, Purdue University – Dept. of Chemistry
Advisor: Professor Jennifer Hovis

2002 **Undergraduate Research Assistant**, Univ. of Missouri St. Louis – Dept. of Chemistry

Advisor: Professor Keith Stine

Publications

21. H.Z. Li, A.C.W. Pike, Y.N. Chang, D. Prakaash, Z. Gelova, J. Stanka, C. Moreau, H.C. Scott, F. Wunder, G. Wolf, A. Scacioc, G. McKinley, H. Batoulis, S. Mukhopadhyay, A. Garofoli, A. Pinto-Fernández, B.M. Kessler, N.A. Burgess-Brown, S. Štefanić, T. Wiedmer, K.L. Dürr[†], V. Puetter[†], A. Ehrmann[†], S. Khalid[†], A. Ingles-Prieto[†], G. Superti-Furga[†], **D.B. Sauer**[†]. "Transport and inhibition of the sphingosine-1-phosphate exporter SPNS2" (in review) DOI: [10.21203/rs.3.rs-3616536/v1](https://doi.org/10.21203/rs.3.rs-3616536/v1)
[†] - Co-corresponding author
20. T.C. Pascoa[†], A.C.W. Pike, C.S. Tautermann, G. Chi, M. Traub, A. Quigley, R. Chalk, S. Štefanić, S. Thamm, A. Pautsch, E.P. Carpenter[†], G. Schnapp[†], **D.B. Sauer**[†] "Structural basis of the mechanism and inhibition of a human ceramide synthase" (in review)
DOI: [10.1101/2023.12.02.569723](https://doi.org/10.1101/2023.12.02.569723)

19. H.Z. Li, A.C.W. Pike, G. Chi, J.S. Hansen, S.G. Lee, K.E.J. Rödström, S.R. Bushell, D. Speedman, A. Evans, D. Wang, D. He, L. Shrestha, C. Nasrallah, N.A. Burgess-Brown, T.R. Dafforn[†], E.P. Carpenter[†], **D.B. Sauer[†]** “Structure and function of the SIT1 proline transporter in complex with the COVID-19 receptor ACE2” (in revision)
DOI: [10.1101/2023.05.17.541173](https://doi.org/10.1101/2023.05.17.541173)
18. S. Raturi, H. Li, Y.N. Chang, A. Scacioc, T. Bohstedt, A. Fernandez-Cid, A. Evans, P. Abrusci, A. Balakrishnan, T.C. Pascoa, D. He, G. Chi, N. Kaur Singh, M. Ye, A. Li, L. Shrestha, D. Wang, E.P. Williams, N.A. Burgess-Brown[†], K.L. Dürr[†], V. Puetter[†], A. Ingles-Prieto[†], **D.B. Sauer[†]** “High-throughput expression and purification of human solute carriers for structural and biochemical studies” *J. Vis. Exp.* (2023)
DOI: [10.3791/65878](https://doi.org/10.3791/65878)
17. H. Tang, H. Li, D. Prakaash, C. Pedebos, X. Qiu, **D.B. Sauer**, S. Khalid, K. Duerr, C.V. Robinson “The solute carrier SPNS2 binds to PI(4,5)P2 to allosterically regulate transport of sphingolipid-1-phosphate” *Mol. Cell*, **83**, 1-14 (2023)
DOI: [10.1016/j.molcel.2023.06.033](https://doi.org/10.1016/j.molcel.2023.06.033)
16. C.D. Klinz-Thompson, M.L. Redondo, C. Mulligan, **D.B. Sauer**, J.J. Marden, J. Song, E. Tajkhorshid, J.F. Hunt, D.L. Stokes, J.A. Mindell, D.N. Wang, R.L. Gonzalez “Elevator mechanism dynamics in a sodium-coupled dicarboxylate transporter”
DOI: [10.1101/2022.05.01.490196](https://doi.org/10.1101/2022.05.01.490196)
15. **D.B. Sauer**, J.J. Marden, J.C. Sudar, J. Song, C. Mulligan, D.N. Wang “Structural basis of ion-substrate coupling in the Na⁺-dependent dicarboxylate transporter VcINDY” *Nature Comm.*, **13**:2644 (2022) DOI: [10.1101/2022.01.11.475879](https://doi.org/10.1101/2022.01.11.475879)
14. D.N. Brawley, **D.B. Sauer***, J. Li*, X. Zheng*, A. Koide*, G.S. Jedhe, T. Suwathee, J. Song, Z. Liu, P.S. Arora, S. Koide, V.J. Torres, D.N. Wang, N.J. Traaseth “Structural basis for inhibition of the efflux pump NorA from *S. aureus*” *Nature Chem. Bio.*, **18**, 706-712 (2022) DOI: [10.1038/s41589-022-00994-9](https://doi.org/10.1038/s41589-022-00994-9)
*- Authors contributed equally
Commented on by:
A. Penmatsa “A (Fab)ulous tool to block efflux” *Nature Chemical Biology* (2022)
13. **D.B. Sauer**, B. Wang, J.C. Sudar, J. Song, J. Marden, W.J. Rice, D.N. Wang “The ups and downs of elevator-type di-/tricarboxylate membrane transporters” *FEBS J*, **289**, 1515-1523 (2022) DOI: [10.1111/febs.16158](https://doi.org/10.1111/febs.16158)
12. **D.B. Sauer[†]** and D.N. Wang[†] “Using machine learning to predict quantitative phenotypes from protein and nucleic acid sequences” DOI: [10.1101/677328](https://doi.org/10.1101/677328)
11. **D.B. Sauer**, J. Song, B. Wang, J.K. Hilton, N.K. Karpowich, J.A. Mindell, W.J. Rice, D.N. Wang “Structure and inhibition mechanism of the human citrate transporter NaCT” *Nature*, **591**, 157-161 (2021) DOI: [10.1038/s41586-021-03230-x](https://doi.org/10.1038/s41586-021-03230-x)
10. **D.B. Sauer**, N. Trebesch, J.J. Marden, N. Cocco, J. Song, A. Koide, S. Koide, E. Tajkhorshid, D.N. Wang “Structural basis for the reaction cycle of DASS dicarboxylate transporters” *eLife*; **9**:e61350 (2020) DOI: [10.7554/eLife.61350](https://doi.org/10.7554/eLife.61350)
Commented on by:
A.W. Duster and H. Lin “Membrane Transport: Riding elevators into and out of cells” *eLife* **9**:e62925 (2020)
9. **D.B. Sauer[†]** and D.N. Wang[†] “Predicting the Optimal Growth Temperatures of Prokaryotes using only Genome Derived Features” *Bioinformatics*, **18**, 3224-3231 (2019)
DOI: [10.1093/bioinformatics/btz059](https://doi.org/10.1093/bioinformatics/btz059)

8. **D.B. Sauer**[†], N.K. Karpowich, J. Song, D.N. Wang[†] “Rapid Bioinformatic Identification of Thermostabilizing Mutations” *Biophys. J.*, **107**, 1420-1428 (2015)
DOI: [10.1016/j.bpj.2015.07.026](https://doi.org/10.1016/j.bpj.2015.07.026)
Commented on by:
C.G. Tate “Identifying Thermostabilizing Mutations in Membrane Proteins by Bioinformatics” *Biophys. J.*, **107**, 1307-1308 (2015).
7. Y.L. Lam*, W. Zeng*, **D.B. Sauer***, Y. Jiang “The Conserved Potassium Channel Filter Can Have Distinct Ion Binding Profiles - Structural Analysis of Rubidium, Cesium and Barium Binding in NaK2K” *J. Gen. Physiol.*, **114**, 181-192 (2014)
DOI: [10.1085/jgp.201411191](https://doi.org/10.1085/jgp.201411191)
6. **D.B. Sauer**, W. Zeng, J. Canty, Y. Jiang “Sodium and Potassium competition in Potassium-selective and Non-selective Channels” *Nature Comm.*, **4**:2721 (2013)
DOI: [10.1038/ncomms3721](https://doi.org/10.1038/ncomms3721)
5. C. Kong, W. Zeng, S. Ye, L. Chen, **D.B. Sauer**, Y. Lam, M.G. Derebe, Y. Jiang “Distinct Gating Mechanisms revealed by the structures of a multi-ligand gated K⁺ channel” *eLife*, **1**:e00184 (2012) DOI: [10.7554/eLife.00184](https://doi.org/10.7554/eLife.00184)
4. J. Liao, H. Li, W. Zeng, **D.B. Sauer**, R. Belemares, Y. Jiang “Structural Insight into the Ion Exchange Mechanism of Sodium/Calcium Exchanger” *Science*, **335**, 686-690 (2012)
DOI: [10.1126/science.1215759](https://doi.org/10.1126/science.1215759)
Commented on by:
J. Abramson, A. Paz, K.D. Philipson “It's All in the Symmetry” *Science*, **335**, 669-670 (2012).
3. **D.B. Sauer**, W. Zeng, S. Raghunathan and Y. Jiang “Protein Interactions Central to Stabilizing the K⁺ Channel Selectivity Filter in a 4-sited Configuration for Selective K⁺ Permeation” *Proc. Natl. Acad. Sci. USA*, **108**, 16634-16639 (2011)
DOI: [10.1073/pnas.1111688108](https://doi.org/10.1073/pnas.1111688108)
2. M.G. Derebe*, **D.B. Sauer***, W. Zeng, A. Alam, N. Shi and Y. Jiang “Tuning the Ion Selectivity of Tetrameric Cation Channels by Changing the Number of Ion Binding Sites” *Proc. Natl. Acad. Sci. USA*, **108**, 598-602 (2011) DOI: [10.1073/pnas.1013636108](https://doi.org/10.1073/pnas.1013636108)
1. M.C. Hull, **D.B. Sauer**, and J.S. Hovis “The Influence of Lipid Chemistry on the Osmotic Response of Cell Membranes: Effect of Non-Bilayer Forming Lipids,” *J. Phys. Chem. B*, **108**, 15890 -15895 (2004) DOI: [10.1021/jp049845d](https://doi.org/10.1021/jp049845d)

Funding

2023	Macular Society Seedcorn Grant (PI)
2023	Medical Research Council Research Grant (Co-PI)
2023	Medical Sciences Internal Fund: Pump-Priming (PI)
2022	Royal Society Research Grant (PI)
2017 - 2019	American Cancer Society Postdoctoral Fellowship (PI)
2016 - 2017	Department of Defense Horizon Award (PI)
2007 - 2010	NIH Predoctoral Institutional Research Training Grant (Awardee)

Peer Reviewer

Nature Communications
Journal of Molecular Biology
Microbes and Environments
Protein Expression and Purification
Structure

Honors and Awards

2020 Poster Award, New York Structural Biology Discussion Group
2014 Biophysics Wiki-edit Contest Winner, Biophysical Society
2014 Cover *Journal of General Physiology* Vol. 144 No. 2
2013 Outstanding Poster Presentation, NYU Medical Center Skirball Institute Retreat
2005 Dale W. Margerum Undergraduate Research Award, Purdue Univ. - Dept. of Chemistry
2005 Outstanding Research Award, Purdue University - Undergraduate Research Symposium
2004 Harrison M. Stine Memorial Scholarship, Purdue University - Dept. of Chemistry
2004 Best Science Paper Award, Butler University Undergraduate Research Conference

Professional Activities

2022-present Senior Radiation Protection Supervisor, Centre for Medicines Discovery
2022-present Member, Nuffield Department of Medicine Health and Wellbeing Steering Group
2022-2023 Representative of Centre for Medicines Discovery to Kavli Institute Board
2021-2023 Lead, Resolute Consortium Work Package 5
2021-present Organizer, Centre for Medicines Discovery Internal Seminar Series
2021 PI Lead, Centre for Medicines Discovery DPhil Symposium
2020 Co-organizer, Biophysical Society Membrane Transport Mini-Symposium
2019-2021 Organizer, NYU Medical Center CryoEM Discussion Group
2019 Organizing Committee, NYU Medical Center Skirball Institute Retreat
2018-2021 Associate Faculty Member, F1000Prime
2004 President, Purdue Science Student Council
2002-2005 Member, Purdue Science Student Council

Invited Seminars and Oral Presentations

2023 Resolute Consortium Final Conference
2023 Brain in Flux - MSCA NeuroTrans Satellite Symposium
2023 Medical University of Vienna – Center of Physiology and Pharmacology
2023 University of Kent – School of Biosciences
2022 University of Oxford – OxBacNet Symposium
2022 SLC13A5 International Research Roundtable
2022 EFMC-ACS MEDI Joint Symposium
2022 University of Oxford – Division of Structural Biology
2022 University of British Columbia – Department of Biochemistry
2021 Target2035 Webinar
2021 University of Oxford – Centre for Medicines Discovery
2020 Biophysical Society Membrane Transport Mini-Symposium
2012 Howard Hughes Medical Institute – Janelia Research Campus

Poster Presentations

- 2023 British Crystallography Association Biological Structures Group - Winter Meeting
- 2023 Resolute Consortium Final Conference
- 2023 Brain in Flux - MSCA NeuroTrans Satellite Symposium
- 2022 Ineos Institute Oxford - Multidisciplinary Approaches to Antimicrobial Resistance
- 2022 Biophysical Society Thematic Meeting - Physical and Quantitative Approaches to Overcome Antibiotic Resistance
- 2021 Biophysical Society - Annual Meeting
- 2020 New York Structural Biology Discussion Group - Winter Meeting
- 2019 New York Area CryoEM - Second Meeting
- 2019 New York Structural Biology Discussion Group - Summer Meeting
- 2019 New York Area CryoEM - First Meeting
- 2018 American Cancer Society - Jiler Conference
- 2015 Biophysical Society - Annual Meeting
- 2012 Gordon Research Conference Ion Channels - Annual Meeting
- 2011 Howard Hughes Medical Institute - Annual Meeting
- 2005 Biophysical Society - Annual Meeting
- 2004 Biophysical Society - Annual Meeting
- 2004 Butler University Undergraduate Research Conference