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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

Peer-reviewed Publications

30. A. Li, A.C.W. Pike, R. Webster, S. Maxwell, W. Wei Liu, G. Chi, J. Palace, D. Beeson, **D.B. Sauer**, Y.Y. Dong “Structures of the human adult muscle-type nicotinic receptor in resting and desensitised states” (in review) DOI: [10.1101/2024.12.13.624530](https://doi.org/10.1101/2024.12.13.624530)
28. T. Wiedmer, S.T. Teoh, E. Christodoulaki, G. Wolf, C. Tian, V. Sedlyarov, A. Jarret, P. Leippe, F. Frommelt, A. Ingles-Prieto, S. Lindinger, B.M.G. Barbosa, S. Onstein, C. Klimek, J. Garcia, I. Serrano, D. Reil, D. Santacruz, M. Piotrowski, S. Noell, C. Bueschl, H. Li, G. Chi, S. Meireiter, T. Oliveira, J.M. Penninger, **D.B. Sauer**, C.M. Steppan, C. Viollet, K. Klavins, J.T. Hannich, U. Goldmann, G. Superti-Furga "Metabolic mapping of the entire human solute carrier superfamily" (in revision)
DOI: [10.1101/2024.09.23.614124](https://doi.org/10.1101/2024.09.23.614124)

27. M. Ye, Z. Liang, D. Zhou, A.C.W. Pike, S.Y. Wang, D. Wang, S. Bakshi, L. Brooke, E.P. Williams, J.M. Elkins, B.M. Kessler, D.I. Stuart, **D.B. Sauer** "Amino acid and viral binding by the high-affinity Cationic Amino acid Transporter 1 (CAT1) from *Mus musculus*" (in revision) DOI: [10.21203/rs.3.rs-4673967/v1](https://doi.org/10.21203/rs.3.rs-4673967/v1)
26. G. Yi, D. Mamalis, M. Ye[†], L. Carrique, M. Fairhead, H. Li, K.L. Duerr, P. Zhang, **D.B. Sauer**[†], F. von Delft[†], B.G. Davis[†], R.J.C. Gilbert[†]. "Di-Gluebodies: Rigid modular nanobody protein assemblies enabling simultaneous determination of high-resolution cryo-EM structures" (in revision) DOI: [10.1101/2024.06.13.598841](https://doi.org/10.1101/2024.06.13.598841)
[†] - Co-corresponding author
25. 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" (accepted) DOI: [10.21203/rs.3.rs-3616536/v1](https://doi.org/10.21203/rs.3.rs-3616536/v1)
24. 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" *Nat. Struct. Mol. Biol.* (2024) DOI: [10.1038/s41594-024-01414-3](https://doi.org/10.1038/s41594-024-01414-3)
23. Z. Gelova, A. Ingles-Prieto, T. Bohstedt, F. Frommelt, G. Chi, Y.N. Chang, J. Garcia, G. Wolf, L. Azzollini, S. Tremolada, A. Scacioc, J.S. Hansen, I. Serrano, A. Droce, J.C. Bernal, N.A. Burgess-Brown, E.P. Carpenter, K.L. Duerr, P. Kristensen, E.R. Geertsma, S. Stefanic, L. Scarabottolo, T. Wiedmer, V. Puetter, **D.B. Sauer**, G. Superti-Furga. "Protein binder toolbox for studies of solute carrier transporters" *J. Mol. Biol.* **436**: 168665 (2024) DOI: [10.1016/j.jmb.2024.168665](https://doi.org/10.1016/j.jmb.2024.168665)
22. D. Digles, A. Ingles-Prieto, V. Dvorak, T.A.M. Mocking, U. Goldmann, A. Garofoli, E.J. Homan, A. Di Silvio, L. Azzollini, F. Sassone, M. Fogazza, F. Bärenz, A. Pommereau, Y. Zuschlag, J.F. Ooms, J. Tranberg-Jensen, J.S. Hansen, J. Stanka, H.J. Sijben, H. Batoulis, E. Bender, R. Martini, A.P. IJzerman, **D.B. Sauer**, L.H. Heitman, V. Manolova, J. Reinhardt, A. Ehrmann, P. Leippe, G.F. Ecker, K.V.M. Huber, T. Licher, L. Scarabottolo, T. Wiedmer, G. Superti-Furga. "Advancing Drug Discovery through Assay Development: A Survey of Tool Compounds within the Human Solute Carrier Superfamily" *Front. Pharmacol.* **15**:1401599 (2024) DOI: [10.3389/fphar.2024.1401599](https://doi.org/10.3389/fphar.2024.1401599)
21. 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" *Nature Comm.*, **15**:5503 (2024) DOI: [10.1038/s41467-024-48921-x](https://doi.org/10.1038/s41467-024-48921-x)
20. Q. Liang, G. Chi, L. Cirqueira, L. Zhi, A. Marasco, N. Pilati, M.J. Gunthorpe, G. Alvaro, C.H. Large, **D.B. Sauer**, W. Treptow, M. Covarrubias "The binding site and mechanism of action of a selective positive allosteric modulator of Kv3 channels" *Nature Comm.*, **15**:2533 (2024) DOI: [10.1038/s41467-024-46813-8](https://doi.org/10.1038/s41467-024-46813-8)

19. L. van Veggel, T. Mocking, H. Sijben, R. Liu, M. Gorostiola Gonzalez, M. Dilweg, J. Royackers, A. Li, V. Kumar, Y. Dong, A. Bullock, **D.B. Sauer**, H. Diliën, G. van Westen, R. Schreiber, L. Heitman, T. Vanmierlo. "Still in search for an EAAT activator: GT949 does not activate EAAT2, nor EAAT3 in impedance and radioligand uptake assays" *ACS Chem. Neurosci.*, **15**, 1424-1431 (2024) DOI: [10.1021/acschemneuro.3c00731](https://doi.org/10.1021/acschemneuro.3c00731)
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.*, **199**, e65878, (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: [10.1038/s41467-022-30406-4](https://doi.org/10.1038/s41467-022-30406-4)
14. D.N. Brawley, **D.B. Sauer**^{*}, J. Li^{*}, X. Zheng^{*}, A. Koide^{*}, G.S. Jedhe, T. Suwatthee, 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)

Invited commentaries

4. D. Speedman and **D.B. Sauer** “Pho Pictures Provide Powerful Perspectives of Phosphate imPorting Proteins” *Structure*, **32**, 849-850 (2024) DOI: [10.1016/j.str.2024.06.006](https://doi.org/10.1016/j.str.2024.06.006)
3. **D.B. Sauer** and D.N. Wang F1000 DOI: [10.3410/f.736896727.793569133](https://doi.org/10.3410/f.736896727.793569133)
2. **D.B. Sauer** and D.N. Wang F1000 DOI: [10.3410/f.733640382.793551250](https://doi.org/10.3410/f.733640382.793551250)
1. **D.B. Sauer** and D.N. Wang F1000 DOI: [10.3410/f.733379480.793547266](https://doi.org/10.3410/f.733379480.793547266)

Patents

1. S. Koide, D.N. Wang, N. Traaseth, A. Koide, D. Brawley, D. Sauer U.S. Patent Application Number PCT/US22/39572 “NorA Inhibitors and Methods of Use” Published 2023

Funding

2024-2027 Medical Research Council Research Grant (Co-PI)
2024 Macular Society Seedcorn Grant (PI)
2023-2024 Medical Sciences Internal Fund: Pump-Priming (PI)
2022-2023 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)

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

2024-present Co-Organizer, Oxford CMD-STRUBI Mini-Symposium series
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

Peer Reviewer

Nature Communications
Proceedings of the National Academy of Sciences USA (PNAS)
Structure
Life Science Alliance
Journal of Molecular Biology
Microbes and Environments
Protein Expression and Purification
Computational and Structural Biotechnology Journal
Protein Science
International Journal of Biological Macromolecules

Teaching Experience

- 2024 Centre for Artificial Intelligence in Precision Medicine lecture
- 2004 Chemistry Tutor, Purdue University Department of Pharmacology

Invited Seminars and Oral Presentations

- 2024 Oxford AMR Network – October meeting
- 2024 SLC13A5 Research Conference
- 2024 University of Copenhagen –Transporter Collaborative meeting
- 2024 Gordon Research Conference – Ligand Recognition and Molecular Gating
- 2024 Baylor College of Medicine – Department of Biochemistry and Molecular Pharmacology
- 2024 Alzheimer’s Research UK – Oxford Drug Discovery Institute Collaborators Meeting
- 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

- 2024 EUbOpen Consortium Annual Meeting
- 2024 Gordon Research Conference - Ligand Recognition and Molecular Gating
- 2024 Gordon Research Conference - Glycolipid and Sphingolipid
- 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
- 2011 Howard Hughes Medical Institute Annual Meeting
- 2005 Biophysical Society Annual Meeting
- 2004 Butler University Undergraduate Research Conference

2004 Biophysical Society Annual Meeting
2003 Turkey Run Analytical Conference