



David S. Roberts

Postdoctoral Scholar, Chemistry

CONTACT INFORMATION

- **Alternate Contact**

David Roberts

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Bio

HONORS AND AWARDS

- Stanford University Libraries Data Sharing Prize, Stanford University Libraries (2025)
- Damon Runyon Fellow, Damon Runyon Cancer Research Foundation (2024 - Present)
- Postdoctoral Career Development Award, American Society for Mass Spectrometry (2024)
- Drs. Igor and Alben Ivanisevic Dissertator Award, University of Wisconsin-Madison (2023)
- Wisconsin Human Proteomics Symposium Rising Star Award, BioPharmaceutical Technology Center Institute and University of Wisconsin-Madison (2022)
- HUPO World Congress Travel Award, Human Proteome Organization (2022)
- AHA Predoctoral Fellow, American Heart Association (2021-2023)
- US HUPO Early Career Researcher Award, US Human Proteome Organization (2021)
- US HUPO Graduate Student Travel Award, US Human Proteome Organization (2022)
- Gary Parr Memorial Award, University of Wisconsin-Madison (2021)
- ASMS Graduate Student Travel Award, American Society for Mass Spectrometry (2021)
- UW-Madison GSFLC Travel Award, University of Wisconsin-Madison (2021)
- UW-Madison Student Research Travel Grant, University of Wisconsin-Madison (2019, 2020, 2023)
- UW SMPH CVRC Scientific Poster Fair Best Poster Award, Cardiovascular Research Center University of Wisconsin-Madison (2018, 2021)
- Charles L. Perrin Summer Fellowship, University of California, San Diego (2016)
- Joseph E. Mayer Award, University of California, San Diego (2016)
- Miguel Velez Scholarship, University of California, San Diego (2015-2016)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, American Society for Mass Spectrometry (2018 - present)
- Member, US Human Proteome Organization (2019 - present)
- Member, American Heart Association (2020 - present)
- Member, Human Proteome Organization (2021 - present)

- Member, Society for Glycobiology (2023 - present)

PROFESSIONAL EDUCATION

- Doctor of Philosophy, University of Wisconsin Madison (2023)
- Ph.D., University of Wisconsin-Madison, Materials Chemistry and Analytical Chemistry (2023)
- B.S. (Double Major), University of California, San Diego, Chemistry and Mathematics (2016)

STANFORD ADVISORS

- Carolyn Bertozzi, Postdoctoral Faculty Sponsor

PATENTS

- Ying Ge, Song Jin, Timothy-neil T. Tiambeng, David S. Roberts. "United States Patent 17/786,482 An accurate and comprehensive cardiac troponin I assay enabled by nanotechnology and proteomics", Wisconsin Alumni Research Foundation, Feb 2, 2023
- Daniel B. Roitman, Danielle R. Chamberlin, David S. Roberts. "United States Patent 10,767,016 Vapor-phase curing catalysis and passivation of siloxane resins in LED applications", Lumileds LLC, Sep 8, 2020

LINKS

- Bertozzi Lab Website: <https://bertozzigroup.stanford.edu/lab-members/david>
- Google Scholar: <https://scholar.google.com/citations?user=nn7CGXgAAAAJ&hl=en>
- Twitter: <https://twitter.com/DSRoberts007>
- LinkedIn: <https://www.linkedin.com/in/davidstephenroberts/>
- ORCID: <https://orcid.org/0000-0002-0478-4987>

Publications

PUBLICATIONS

- **The protease Cathepsin K can debulk the cancer glycoalyx.** *The Journal of biological chemistry*
Kuo, A., Tender, G. S., Chow, W. D., Riley, N. M., Wen, K. C., Park, S., Paek, J. H., Roberts, D. S., Peltan, E. L., Paszek, M. J., Bertozzi, C. R.
2026; 111206
- **Structural Heterogeneity of Proteoform-Ligand Complexes in Adenosine Monophosphate-Activated Protein Kinase Uncovered by Integrated Top-Down Mass Spectrometry.** *Journal of the American Chemical Society*
Chan, H., Krichel, B., Bandura, L. J., Chapman, E. A., Rogers, H. T., Fischer, M. S., Roberts, D. S., Gao, Z., Wang, M., Wu, J., Uetrecht, C., Jin, S., Ge, et al
2025
- **Rational Design of a Foldon-Derived Heterotrimer Guided by Quantitative Native Mass Spectrometry.** *Journal of the American Chemical Society*
Liu, X., Roberts, D. S., Bingman, C. A., Ge, Y., Gellman, S. H.
2025
- **Rational design of a foldon-derived heterotrimer guided by quantitative native mass spectrometry.** *bioRxiv : the preprint server for biology*
Liu, X., Roberts, D. S., Bingman, C. A., Jin, S., Ge, Y., Gellman, S. H.
2025
- **MFSD6 is an entry receptor for enterovirus D68.** *Nature*
Varanese, L., Xu, L., Peters, C. E., Pintilie, G., Roberts, D. S., Raj, S., Liu, M., Ooi, Y. S., Diep, J., Qiao, W., Richards, C. M., Callaway, J., Bertozzi, et al
2025
- **Top-down proteomics.** *Nature reviews. Methods primers*
Roberts, D. S., Loo, J. A., Tsybin, Y. O., Liu, X., Wu, S., Chamot-Rooke, J., Agar, J. N., Paša-Tolić, L., Smith, L. M., Ge, Y.
2024; 4 (1)

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- **Directed evolution of genetically encoded LYTAGs for cell-mediated delivery.** *Proceedings of the National Academy of Sciences of the United States of America*
Yang, J. L., Yamada-Hunter, S. A., Labanieh, L., Sotillo, E., Cheah, J. S., Roberts, D. S., Mackall, C. L., Bertozzi, C. R., Ting, A. Y.
2024; 121 (13): e2320053121
 - **Native Top-Down Mass Spectrometry for Characterizing Sarcomeric Proteins Directly from Cardiac Tissue Lysate.** *Journal of the American Society for Mass Spectrometry*
Chapman, E. A., Li, B. H., Krichel, B., Chan, H., Buck, K. M., Roberts, D. S., Ge, Y.
2024
 - **A Lectin-Drug Conjugate CRISPR Screen Identifies Sortilin as the Lysosomal Trafficking Receptor for Galectin-1**
Donnelly, J., Kamber, R., Wisnovsky, S., Roberts, D., Peltan, E., Bassik, M.
OXFORD UNIV PRESS INC.2023: 1055
 - **Identification of TAG-72 carriers and glycoproteomic mapping of the epitope**
Peltan, E. L., Roberts, D. S., Riley, N. M., Bertozzi, C. R.
OXFORD UNIV PRESS INC.2023: 1047
 - **Structure and dynamics of endogenous cardiac troponin complex in human heart tissue captured by native nanoproteomics.** *Nature communications*
Chapman, E. A., Roberts, D. S., Tiambeng, T. N., Andrews, J., Wang, M. D., Reasoner, E. A., Melby, J. A., Li, B. H., Kim, D., Alpert, A. J., Jin, S., Ge, Y.
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 - **Mass Spectrometry-Based Multiomics Identifies Metabolic Signatures of Sarcopenia in Rhesus Monkey Skeletal Muscle.** *Journal of proteome research*
Pergande, M. R., Osterbauer, K. J., Buck, K. M., Roberts, D. S., Wood, N. N., Balasubramanian, P., Mann, M. W., Rossler, K. J., Diffie, G. M., Colman, R. J., Anderson, R. M., Ge, Y.
2023
 - **Directed Evolution of Genetically Encoded LYTAGs for Cell-Mediated Delivery.** *bioRxiv : the preprint server for biology*
Yang, J. L., Yamada-Hunter, S. A., Labanieh, L., Sotillo, E., Cheah, J. S., Roberts, D. S., Mackall, C. L., Ting, A. Y., Bertozzi, C. R.
2023
 - **Galectin-3 does not interact with RNA directly.** *Glycobiology*
Peltan, E. L., Riley, N. M., Flynn, R. A., Roberts, D. S., Bertozzi, C. R.
2023
 - **Comprehensive Characterization of Endogenous Phospholamban Proteoforms Enabled by Photocleavable Surfactant and Top-down Proteomics.** *Analytical chemistry*
Rogers, H. T., Roberts, D. S., Larson, E. J., Melby, J. A., Rossler, K. J., Carr, A. V., Brown, K. A., Ge, Y.
2023
 - **Structure and dynamics of endogenous protein complexes in human heart tissue captured by native nanoproteomics.** *Research square*
Chapman, E. A., Roberts, D. S., Tiambeng, T. N., Andrews, J., Wang, M. D., Reasoner, E. A., Melby, J. A., Li, B. H., Kim, D., Alpert, A. J., Jin, S., Ge, Y.
2023
 - **Structure and dynamics of endogenous protein complexes in human heart tissue captured by native nanoproteomics.** *bioRxiv : the preprint server for biology*
Chapman, E. A., Roberts, D. S., Tiambeng, T. N., Andrews, J., Wang, M., Reasoner, E. A., Melby, J. A., Li, B. H., Kim, D., Alpert, A. J., Jin, S., Ge, Y.
2023
 - **Bromodomain-containing Protein 4 regulates innate inflammation via modulation of alternative splicing.** *Frontiers in immunology*
Mann, M. W., Fu, Y., Gearhart, R. L., Xu, X., Roberts, D. S., Li, Y., Zhou, J., Ge, Y., Brasier, A. R.
2023; 14: 1212770
 - **Top-down proteomics of myosin light chain isoforms define chamber-specific expression in the human heart.** *Journal of molecular and cellular cardiology*
Bayne, E. F., Rossler, K. J., Gregorich, Z. R., Aballo, T. J., Roberts, D. S., Chapman, E. A., Guo, W., Palecek, S. P., Ralphe, J. C., Kamp, T. J., Ge, Y.
2023

- **MASH Native: A Unified Solution for Native Top-Down Proteomics Data Processing.** *Bioinformatics (Oxford, England)*
Larson, E. J., Pergande, M. R., Moss, M. E., Rossler, K. J., Wenger, R. K., Krichel, B., Josyer, H., Melby, J. A., Roberts, D. S., Pike, K., Shi, Z., Chan, H. J., Knight, et al
2023
- **High sensitivity top-down proteomics captures single muscle cell heterogeneity in large proteoforms.** *Proceedings of the National Academy of Sciences of the United States of America*
Melby, J. A., Brown, K. A., Gregorich, Z. R., Roberts, D. S., Chapman, E. A., Ehlers, L. E., Gao, Z., Larson, E. J., Jin, Y., Lopez, J. R., Hartung, J., Zhu, Y., McIlwain, et al
2023; 120 (19): e2222081120
- **Integrated proteomics reveals alterations in sarcomere composition and developmental processes during postnatal swine heart development** *JOURNAL OF MOLECULAR AND CELLULAR CARDIOLOGY*
Aballo, T. J., Roberts, D. S., Bayne, E. F., Zhu, W., Walcott, G., Mahmoud, A. I., Zhang, J., Ge, Y.
2023; 176: 33-40
- **Bromodomain-containing Protein 4 Regulates Innate Inflammation in Airway Epithelial Cells via Modulation of Alternative Splicing.** *bioRxiv : the preprint server for biology*
Mann, M., Fu, Y., Xu, X., Roberts, D. S., Li, Y., Zhou, J., Ge, Y., Brasier, A. R.
2023
- **Synthesis, Self-Assembly Properties, and Degradation Characterization of a Nonionic Photocleavable Azo-Sulfide Surfactant Family** *LANGMUIR*
Brown, K. A., Gugger, M. K., Roberts, D. S., Moreno, D., Chae, P., Ge, Y., Jin, S.
2023: 1465-1473
- **Necroptosis is associated with Rab27-independent expulsion of extracellular vesicles containing RIPK3 and MLKL** *JOURNAL OF EXTRACELLULAR VESICLES*
Gupta, K., Brown, K. A., Hsieh, M. L., Hoover, B. M., Wang, J., Khoury, M. K., Pilli, V., Beyer, R. S. H., Voruganti, N. R., Chaudhary, S., Roberts, D. S., Murphy, R. M., Hong, et al
2022; 11 (9): e12261
- **Distinct core glycan and O-glycoform utilization of SARS-CoV-2 Omicron variant Spike protein RBD revealed by top-down mass spectrometry** *CHEMICAL SCIENCE*
Roberts, D. S., Mann, M., Li, B. H., Kim, D., Braiser, A. R., Jin, S., Ge, Y.
2022; 13 (36): 10944-10949
- **One-Pot Exosome Proteomics Enabled by a Photocleavable Surfactant** *ANALYTICAL CHEMISTRY*
Buck, K. M., Roberts, D. S., Aballo, T. J., Inman, D. R., Jin, S., Ponik, S., Brown, K. A., Ge, Y.
2022; 94 (20): 7164-7168
- **Sustainable Coproduction of Two Disinfectants via Hydroxide-Balanced Modular Electrochemical Synthesis Using a Redox Reservoir** *ACS CENTRAL SCIENCE*
Wang, R., Sheng, H., Wang, F., Li, W., Roberts, D. S., Jin, S.
2021; 7 (12): 2083-2091
- **Multiomics Method Enabled by Sequential Metabolomics and Proteomics for Human Pluripotent Stem-Cell-Derived Cardiomyocytes** *JOURNAL OF PROTEOME RESEARCH*
Bayne, E. F., Simmons, A. D., Roberts, D. S., Zhu, Y., Aballo, T. J., Wancewicz, B., Palecek, S. P., Ge, Y.
2021; 20 (10): 4646-4654
- **Structural O-Glycoform Heterogeneity of the SARS-CoV-2 Spike Protein Receptor-Binding Domain Revealed by Top-Down Mass Spectrometry** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
Roberts, D. S., Mann, M., Melby, J. A., Larson, E. J., Zhu, Y., Brasier, A. R., Jin, S., Ge, Y.
2021; 143 (31): 12014-12024
- **High-Throughput Multi-attribute Analysis of Antibody-Drug Conjugates Enabled by Trapped Ion Mobility Spectrometry and Top-Down Mass Spectrometry** *ANALYTICAL CHEMISTRY*
Larson, E. J., Roberts, D. S., Melby, J. A., Buck, K. M., Zhu, Y., Zhou, S., Han, L., Zhang, Q., Ge, Y.
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- **Ultrafast and Reproducible Proteomics from Small Amounts of Heart Tissue Enabled by Azo and timsTOF Pro** *JOURNAL OF PROTEOME RESEARCH*
Aballo, T. J., Roberts, D. S., Melby, J. A., Buck, K. M., Brown, K. A., Ge, Y.
2021; 20 (8): 4203-4211
- **Novel Strategies to Address the Challenges in Top-Down Proteomics** *JOURNAL OF THE AMERICAN SOCIETY FOR MASS SPECTROMETRY*
Melby, J. A., Roberts, D. S., Larson, E. J., Brown, K. A., Bayne, E. F., Jin, S., Ge, Y.
2021; 32 (6): 1278-1294
- **Discovery of RSV-Induced BRD4 Protein Interactions Using Native Immunoprecipitation and Parallel Accumulation-Serial Fragmentation (PASEF) Mass Spectrometry** *VIRUSES-BASEL*
Mann, M., Roberts, D. S., Zhu, Y., Li, Y., Zhou, J., Ge, Y., Brasier, A. R.
2021; 13 (3)
- **Functionally Integrated Top-Down Proteomics for Standardized Assessment of Human Induced Pluripotent Stem Cell-Derived Engineered Cardiac Tissues** *JOURNAL OF PROTEOME RESEARCH*
Melby, J. A., de Lange, W. J., Zhang, J., Roberts, D. S., Mitchell, S. D., Tucholski, T., Kim, G., Kyrvasilis, A., McIlwain, S. J., Kamp, T. J., Ralphe, J., Ge, Y.
2021; 20 (2): 1424-1433
- **Top-down proteomics: challenges, innovations, and applications in basic and clinical research** *EXPERT REVIEW OF PROTEOMICS*
Brown, K. A., Melby, J. A., Roberts, D. S., Ge, Y.
2020; 17 (10): 719-733
- **MASH Explorer: A Universal Software Environment for Top-Down Proteomics** *JOURNAL OF PROTEOME RESEARCH*
Wu, Z., Roberts, D. S., Melby, J. A., Wenger, K., Wetzels, M., Gu, Y., Ramanathan, S., Bayne, E. F., Liu, X., Sun, R., Ong, I. M., McIlwain, S. J., Ge, et al
2020; 19 (9): 3867-3876
- **Nanoproteomics enables proteoform-resolved analysis of low-abundance proteins in human serum** *NATURE COMMUNICATIONS*
Tiambeng, T. N., Roberts, D. S., Brown, K. A., Zhu, Y., Chen, B., Wu, Z., Mitchell, S. D., Guardado-Alvarez, T. M., Jin, S., Ge, Y.
2020; 11 (1): 3903
- **Quantum Ensembles of Silicon Nanoparticles: Discrimination of Static and Dynamic Photoluminescence Quenching Processes** *JOURNAL OF PHYSICAL CHEMISTRY C*
Holleth, G., Roberts, D. S., Sewell, M., Wensley, E., Wagner, J., Murray, W., Krotz, A., Toth, B., Vijayakumar, V., Sailor, M. J.
2019; 123 (29): 17976-17986
- **Reproducible large-scale synthesis of surface silanized nanoparticles as an enabling nanoproteomics platform: Enrichment of the human heart phosphoproteome** *NANO RESEARCH*
Roberts, D. S., Chen, B., Tiambeng, T. N., Wu, Z., Ge, Y., Jin, S.
2019; 12 (6): 1473-1481
- **Analysis of cardiac troponin proteoforms by top-down mass spectrometry** *POST-TRANSLATIONAL MODIFICATIONS THAT MODULATE ENZYME ACTIVITY*
Tiambeng, T. N., Tucholski, T., Wu, Z., Zhu, Y., Mitchell, S. D., Roberts, D. S., Jin, Y., Ge, Y.
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2019; 626: 347-374
- **Oriented Nanofibrous Polymer Scaffolds Containing Protein-Loaded Porous Silicon Generated by Spray Nebulization** *ADVANCED MATERIALS*
Zuidema, J. M., Kumeria, T., Kim, D., Kang, J., Wang, J., Hollett, G., Zhang, X., Roberts, D. S., Chan, N., Dowling, C., Blanco-Suarez, E., Allen, N. J., Tuszynski, et al
2018; 30 (12): e1706785
- **Preparation of Photoluminescent Porous Silicon Nanoparticles by High-Pressure Microfluidization** *PARTICLE & PARTICLE SYSTEMS CHARACTERIZATION*
Roberts, D. S., Estrada, D., Yagi, N., Anglin, E. J., Chan, N. A., Sailor, M. J.
2017; 34 (3)