Daniel L. Kober

Assistant Professor
W.W. Caruth, Jr. Scholar in Biomedical Research
Department of Biochemistry
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Positions

- Assistant Professor, Department of Biochemistry — 2022-present
  - University of Texas Southwestern Medical Center
- Postdoctoral Fellow, Labs of Dan Rosenbaum and Arun Radhakrishnan — 2017-2022
  - University of Texas Southwestern Medical Center

Education

- **Washington University in St. Louis** — May 2017
  - Ph.D. in Biomedical Sciences — GPA: 3.81
  - Thesis: Structural, Biophysical, and Functional Studies of TREM2 In Neurodegenerative Disease
  - Mentor: Tom Brett
- **Evangel University** — May 2012
  - B.S. in Biology and Chemistry awarded Summa Cum Laude — GPA: 3.96

Awards and Honors

- **Postdoctoral**
  - NIGMS K99/R00 Pathway to Independence Award — 2021-present
  - American Heart Association Post-Doctoral Fellowship — 2018-2020
  - Helmsley Scholarship to attend the Cryo-EM course at Cold Spring Harbor — 2018
- **Graduate**
  - American Heart Association Pre-Doctoral Fellowship — 2017
  - American Heart Association Pre-Doctoral Fellowship — 2015-2017
  - Cell Molecular Biology Training Grant — 2012-2014
  - NSF-GRF Fellowship Honorable Mention — 2014
- **Undergraduate**
  - Outstanding graduate in Chemistry — 2012
  - Endowed Scholarship, Science and Technology — 2009-2012
  - Founder's Scholarship, Half Tuition Award — 2008-2012
  - Dean's list, Evangel University — 2008-2012

Current Research Support

- UT Southwestern Endowed Scholars Program — 2022
- **R01GM155152 (NIH)** — 2024-2029
  - Structural and mechanistic basis for the maturation of site-one protease in the secretory pathway
- **R00GM141261 (NIH)** — 2023-2026
  - The mechanistic basis for targeted protein degradation in lipid metabolism

Previous Research Support

- UT Science and Technology Acquisition and Retention Program (STARS) Award 2022
- American Heart Association (18POST34080141) 2018-2020
  - Structural and biophysical investigation of Scap-SREBP activation
- American Heart Association (17PRE32780001) 2017
  - Structural, biophysical, and functional investigation of TREM2 interaction with ligands
- American Heart Association (15PRE22110004) 2015-2017
  - Structural and functional consequences of TREM-2 mutants linked to neuroinflammation

Teaching and Service

- **Mentor Training**
  - UTSW Research Mentor Training Program Fall 2024
    - Four hour structured in-person training program
- **Teaching**
  - Grant writing course discussion group, Biological Chemistry program Fall 2024
  - Macromolecules and Metabolism: Fatty acid synthesis and oxidation Fall 2024
  - Core Course Discussion Leader, Proteins Module Fall 2023, 2024
  - Core Course Discussion Leader, Cell Biology Module Fall 2022, 2023
  - Discussion group leader, Responsible Conduct of Research Spring 2023
  - Enzymes & Disease Course: Lipid Metabolism and Disease Spring 2023, 2024
- **Graduate Programs**
  - Core course curriculum committee 2024-present
  - Thesis Committee Member: Louis Walton, MSTP 2024-present
  - Qualifying Exam Chair, Biological Chemistry Program (3 exams) 2023-2024
  - Qualifying Exam Committee Member, Molecular Biophysics Program (1 exam) Spring 2024
  - Graduate School Awards Committee, Molecular Biophysics Representative Fall 2023-26
  - Graduate Admissions Committee, Biological Chemistry Representative Fall 2023-26
- **Other Service**
  - NIH Early Career Reviewer Program Spring 2024
  - Faculty Search Committee, Dept of Biochemistry 2023-2025
  - Hosted Conrad Leadership Program undergraduate intern Summer 2023
  - Hosted STARS High School intern Summer 2023
  - Hosted NIH-funded PB2PHD Postbac students
    - Ashley Bullington 2024-2025
    - Ysidro Motto Summer 2023
  - Biochemistry Science and Society Committee 2023-present
- **Peer Review**
  - Early Career Reviewer, Journal of Biological Chemistry
  - Reviewed for: Science, eLife, Nature Cell Biology, Scientific Reports, Journal of Cell Biology, Biophysical Journal, Integrative Biology, Archives of Biochemistry and Biophysics, Frontiers in Bioengineering and Biotechnology, and Frontiers in Immunology.

Manuscripts as corresponding author

3. Structures of the multi-domain oxygen sensor DosP: remote control of a c-di-GMP phosphodiesterase by a regulatory PAS domain. Wu W, Kumar K, Brautigam CA, Tso S-C, **Kober DL***, and Gilles-Gonzalez MA*. **Nature Communications** (2024). PMID: 39511182.

* co-corresponding authors

2. *SPRING licenses S1P-mediated cleavage of SREBP2 by displacing an inhibitory pro-domain*. Hendrix S, Dartigue V, Hall H, Bawaria S, Kingma J, Bajaj B, Zelcer N*, and **Kober DL***. **Nature Communications** (2024). PMID: 38977690.
   * co-corresponding authors
1. *Development of a mutant aerosolized ACE2 that neutralizes SARS-CoV-2 in vivo*. **Kober DL***, Van Dyke MCC, Eitson JL, Rosenbaum DM*, and Schoggins JW* **mBio** (2024). PMID: 38771062.
   * co-corresponding authors

Other manuscripts as faculty

2. *Development of a monoclonal antibody for MARCH6, an E3 ligase that regulates proteins that control lipid homeostasis*. Xu S, Donnelly L, **Kober DL**, Mak M, and Radhakrishnan A. **Journal of Lipid Research**. (2024).
1. *SPRING is a dedicated licensing factor for SREBP-specific activation by S1P*. Hendrix S, Tan JME, Ndoj K, Kingma J, Valiloo M, Zijlstra LF, Ottenhoff R, Seidah NG, Loregger A, **Kober DL**, and Zelcer N. **Molecular and Cellular Biology**. (2024). PMID: 38747374.

Manuscripts prior to faculty position

12. *Scap Structures Highlight Key Role for Rotation of Intertwined Luminal Loops in Cholesterol Sensing.* **Kober DL**, Radhakrishnan A, Goldstein JL, Brown MS, Clark LD, Bai X-C, and Rosenbaum DM. **Cell**. (2021) PMID: 34139175.
11. *Identification of a degradation signal at the carboxy terminus of SREBP2: A new role for this domain in cholesterol homeostasis.* **Kober DL*,** Xu S*, Li S, Bajaj B, Liang G, Rosenbaum DM, and Radhakrishnan A. **Proceedings of the National Academy of Sciences**. (2020) PMID: 33106423.
    *Contributed equally.
10. *Functional insights from biophysical study of TREM2 interactions with ApoE and $A\beta_{1\text{-}42}$.* **Kober DL**, Stuchell-Brereton SD, Kluender CE, Dean HB, Strickland MR, Steinberg DF, Nelson SS, Baban B, Holtzman DM, Frieden C, Alexander-Brett J, Roberson ED, Song Y, and Brett TJ. **Alzhiemer's & Dementia.** (2021) PMID: 33090700.
9. *YbtT is a low-specificity type II thioesterase that maintains production of the metallophore yersiniabactin in pathogenic enterobacteria.* Ohlemacher SI, Xu Y, **Kober DL**, Malik M, Nix JC, Brett TJ, Henderson JP. **J Biol Chem**. (2018) PMID: 30355735.
8. *Limiting Respiratory Viral Infection by Targeting Antiviral and Immunological Functions of BST-2/Tetherin: Knowledge and Gaps.* Berry KN, **Kober DL**, Su A, Brett TJ. **Bioessays**. (2018) PMID: 30113067.
7. *TREM2-ligand interactions in health and disease.* **Kober DL** and Brett TJ. **Journal of Molecular Biology**. (2017) PMID: 28432014.
6. *Neurodegenerative disease mutations in TREM2 reveal a functional surface and distinct loss-of-function mechanisms.* **Kober DL**, Alexander-Brett JM, Karch CM, Cruchaga C, Colonna M, Holtzman MJ, Brett TJ. **eLife** (2016) PMID: 27995897.
    Highlighted: *Detailing the Molecular Roots of Alzheimer's Disease* https://www.aps.anl.gov/APS-Science-Highlight/2016-12-21/detailing-the-molecular-roots-of-alzheimers-disease
5. *First comprehensive structural and biophysical analysis of MAPK13 inhibitors targeting DFG-in and DFG-out binding modes.*

Yurtsever Z, Patel DA, **Kober DL**, Su A, Miller CA, Romero AG, Holtzman MJ, Brett TJ. **Biochimica et Biophysica Acta** (2016) PMID: 27369736.

4. *Efficient Mammalian Cell Expression and Single-step Purification of Extracellular Glycoproteins for Crystallization.*
   Kober DL*, Yurtsever Z*, Brett TJ. **Journal of Visualized Experiments** (2015) PMID: 26780656.
   *Contributed equally.
3. *TREM-2 promotes macrophage survival and lung disease after respiratory viral infection.*
   Wu K, Byers DE, Jin X, Agapov E, Alexander-Brett JM, Patel AC, Cella M, Gilfilan S, Colonna M, **Kober DL,** Brett TJ, Holtzman MJ. **Journal of Experimental Medicine** (2015) PMID: 25897174.
2. *Preparation, crystallization, and preliminary crystallographic analysis of wild-type and mutant human TREM-2 ectodomains linked to neurodegenerative and inflammatory diseases.*
   Kober DL, Wanhainen KM, Johnson BM, Randolph DT, Holtzman MJ, Brett TJ. **Protein Expression and Purification** (2014) PMID: 24508568.
1. *Microfibril-associated Glycoprotein 2 (MAGP2) Loss of Function Has Pleiotropic Effects in Vivo.*
   Combs MD, Knutsen RH, Broekelmann TJ, Toennies HM, Brett TJ, Miller CA, **Kober DL**, Craft CS, Atkinson JJ, Shipley JM, Trask BC, Mecham RP. **Journal of Biological Chemistry** (2013) PMID: 23963447.

Presentations

14. SPRINGing off the lock: Activation of site-one protease for lipogenic transcription. **ASBMB Deuel Conference on Lipids**. Jan 2025, Long Beach CA (Oral presentation).
13. Regulated maturation of secretory proteases. Jan 17th, 2025. **Department of Molecular Genetics Seminar Series**. UT Southwestern. (Oral presentation).
12. SPRINGing off the lock: activation of site-1 protease. May 13th, 2024. **Chemistry-Biology Interface 2024 Symposium.** University of Michigan. (Oral presentation).
11. SPRINGing off the lock: activation of site-1 protease. Jan 5th, 2024. **Department of Molecular Genetics Seminar Series**. UT Southwestern. (Oral presentation).
10. Structural and mechanistic basis for the maturation of Site-One Protease in the secretory pathway. **ASBMB Serine proteases in pericellular proteolysis and signaling**. Nov 2-3, 2023. (Oral presentation)
    **Best flash talk award*
9. Protein turnover and lipid metabolism. **New Faculty Research Forum.** UT Southwestern. Oct 30th, 2023. (Oral presentation)
8. Visualizing a Membrane Sensor: Structural Basis for Cholesterol Regulation by Scap. **DFW Young Investigator's Symposium.** February 2023. UT Arlington. (Oral presentation)
7. **Kober DL.** Xiaochen Bai, Arun Radhakrishnan, and Daniel M. Rosenbaum. *Structural basis of cholesterol regulation by Scap and Insig.* **The ASBMB Deuel Conference on Lipids**. March 2022. Monterey, CA. (Poster)
6. **Kober DL.** Xiaochen Bai, Arun Radhakrishnan, and Daniel M. Rosenbaum. Scap Structures Highlight Key Role for Rotation of Intertwined Luminal Loops in Cholesterol Sensing. **Three Dimensional Electron Microscopy Gordon Research Conference.** Oct 2021. Waterville Valley, NH. (Poster)
5. **Kober DL.** *Scap Structures Highlight Key Role for Rotation of Intertwined Luminal Loops in Cholesterol Sensing.* **Future Stars in CryoEM II**. June 16, 2021. Medical College of Wisconsin. (Talk)

4. **Kober DL**, Shimeng Xu, Shili Li, Bilkish Bajaj, Guosheng Liang, Arun Radhakrishnan, and Daniel M. Rosenbaum. *Functional and biophysical investigation of the Scap-SREBP pathway.* **The ASBMB Deuel Conference on Lipids**. March 2020. Coronado, CA. (Poster)
3. **Kober DL**, Shimeng Xu, Shili Li, Lindsay Clark, Guosheng Liang, Arun Radhakrishnan, and Daniel M. Rosenbaum. *A molecular dissection of the interaction between SREBP2 and Scap*. **Gordon Research Conference Molecular Membrane Biology**. July 2019. Andover, NH. (Poster)
2. **Kober DL**, Alexander-Brett J, Cruchaga C, Colonna M, and Brett TJ. *Neurodegenerative disease mutations in TREM2 reveal a functional surface and two distinct loss-of-function mechanisms*. Poster Presentation, **Gordon Research Conference Neuroimmune Communication in Health & Disease**. January 2017. Ventura Beach, CA. (Poster)
1. **Kober DL**, Brett TJ: *Structural Studies of TREM-2 Mutants Linked to Neurodegenerative Diseases*. Acta Crystallographica Section A: Foundations and Advances 08/2014; 70(a1). DOI:10.1107/S2053273314097514. Abstract for poster presentation, **23rd conference, International Union of Crystallography**. September 2014. Montreal, Canada. (Poster)