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Education

2003-2007 Doctor of Philosophy (conferred January 2008)
MRC Laboratory of Molecular Biology; Trinity College, University of Cambridge, UK
- Advisor: Dr. Philip Evans, FRS
- Subject: Molecular Biology
- Thesis: "Structural and functional studies of vesicle coat components"

1999-2003 Bachelor of Science, *Summa cum laude* (conferred May 2003)
Vanderbilt University, Nashville, TN
- College of Arts and Sciences Founder's Medalist
- High Honors in Chemistry, Classical Studies minor, GPA: 3.989/4.000
- Honors thesis: "Fiber Diffraction Studies of Potexviruses and Potyviruses"

Employment

2014-present Assistant Professor of Biological Sciences, Vanderbilt University
2015-present Assistant Professor of Biochemistry, Vanderbilt University (secondary appointment)
- Two parental leaves (Spring 2016, Fall 2019)
- Affiliations: Center for Structural Biology, Molecular Biophysics Training Program, Chemical & Physical Biology Program, Epithelial Biology Center, Vanderbilt Brain Institute, Vanderbilt-Ingram Cancer Center

2009-2013 Postdoctoral Research Associate
Cambridge Institute for Medical Research, Cambridge, UK
- Advisor: Professor David Owen, FRS

2007-2009 Junior Consultant, The Boston Consulting Group, London, UK

Honors and awards

2019 Nordhaus Award for Excellence in Undergraduate Teaching
Vanderbilt College of Arts & Sciences
2017 Vanderbilt Faculty Cutting-Edge Flexner Discovery Lecture
2016 NIGMS Maximizing Investigators' Research Award (MIRA)
2016 Pew Biomedical Scholars Award
2016 Littlejohn Faculty Fellow, Vanderbilt Undergraduate Summer Research Program
2016 Provost Research Studio for Faculty Development, Vanderbilt University
2013 Gordon Research Conference travel award (Molecular Membrane Biology)
2012 Keystone Symposia Future of Science Fund Scholarship (Structural Biology of Cellular Processes)
2011 Protein Society Young Investigator Travel Grant/Finn Wold Travel Award
2010 Gordon Research Conference travel award (Lysosomes & Endocytosis)
2004 Academy of Achievement International Achievement Summit. Chicago, IL

2003	Postgraduate fellowship awards: Medical Research Council Laboratory of Molecular Biology Scholarship; Trinity College Honorary External Research Studentship; National Science Foundation Fellowship (declined); Gates Cambridge Scholarship (declined)
2003	Phi Beta Kappa, Alpha of Tennessee (Vanderbilt)
2003	Phi Beta Kappa Joel Tellinghuisen Award for Undergraduate Research (Vanderbilt)
2003	Outstanding Senior in Chemistry (Vanderbilt Dept. of Chemistry)
2003	Donald E Pearson Award for Undergraduate Research (Vanderbilt Dept. of Chemistry)

Research

Working papers

1. Date SS, Xu P, Hepowit NL, Diab NS, Best J, Xie B, Jiale Du, Strieter ER, **Jackson LP**, MacGurn JA, Graham TR. Ubiquitination regulates COPI-dependent retrieval of Golgi SNAREs. Under review, *Nature Communications*.

Role: I supervised B Xie (graduate student), who assisted with biochemical experiments, and provided reagents to support protein purification and biochemistry. I also provided feedback on the manuscript. This work was partly supported by my NIH NIGMS R35 grant.

2. Chandra M, Collins BM, and **Jackson LP**. Biochemical basis for an interaction between SNX27 and the flexible SNX1 N-terminus. Manuscript in preparation, *Advances in Biological Regulation* (due October 2021).

Role: I supervised and advised postdoctoral scholar, M Chandra, who originally conceived the project and carried out biochemical experiments. I performed structural modeling and wrote the manuscript with assistance from Dr. Chandra. This work was supported by my NIH NIGMS R35 grant.

3. Xie B, Guillem C, Date SS, Jung C, Kendall AK, Best J, Graham TR, and **Jackson LP**. An interaction between β'-COP and its ArfGAP, Glo3, is required to maintain post-Golgi cargo recycling. Manuscript in preparation. (Submission Oct/Nov 2021.)

Role: I conceived this project; conducted preliminary biochemical experiments; supervised B Xie (graduate student) and C Jung (undergraduate); and wrote the manuscript. Yeast work was completed in collaboration with the Graham lab (graduate students C Guillem and J Best). This work was supported by my NIH NIGMS R35 grant.

4. Kendall AK, Chandra M, Xie B, Wan W, and **Jackson LP**. Improved retromer single particle reconstructions reveal a new oligomeric interface mediated by VPS26. Manuscript in preparation. (Submission Nov/Dec 2021.)

Role: I conceived and supervised this project; assisted in structure determination and refinement; and wrote the manuscript. This work was supported by my NIH NIGMS R35 grant.

Articles in refereed journals

Jackson Lab publications (Vanderbilt)

22. Kai-En Chen, Qian Guo, Yi Cui, Amy K. Kendall, Joanna Sacharz, Timothy A. Hill, Ryan J. Hall, Suzanne J. Norwood, Natalya Leneva, Boyang Xie, Zhe Yang, Rajesh Ghai, Hiroaki Suga, David Fairlie, David A. Stroud, **Jackson LP**, Rohan D. Teasdale, Toby Passioura, Brett M. Collins. (2020). *De novo* macrocyclic peptides for inhibiting, stabilising and probing the function of the Retromer endosomal trafficking complex. *Science Advances*, accepted for publication. (*bioRxiv*. 12.03.410779; doi: https://doi.org/10.1101/2020.12.03.410779).

21. Chandra M†, Kendall AK, and **Jackson LP**†. (2021). Toward understanding the molecular role of SNX27/retromer in human health and disease. *Frontiers Cell & Developmental Biology* 9:642378. (†corresponding authors)

Role: I conceived and co-wrote this peer-reviewed review article with M Chandra (postdoc) and A Kendall (lab manager) for a special issue entitled "Protein Sorting in the Endosomal Hub: a WASH of Old and New Players". This article highlights recent advances in understand the structural and cell biology of SNX27 and retromer.

20. Xie B, Jung C, Chandra M, Engel A, Kendall AK, and **Jackson LP**. (2021). The Glo3 GAP crystal structure supports the molecular niche model for ArfGAPs in COPI coats. *Advances in Biological Regulation* 79:100781.

Role: I conceived and supervised the project in my laboratory; assisted in structure determination; and wrote the manuscript with input from co-authors. I supervised B Xie (graduate student) and two undergraduate co-authors (C Jung, A Engel). This work was supported by my NIH NIGMS R35 grant.

19. Snider CE, Chandra M, McDonald NA, Willet WH, Collier SE, Ohi MD, **Jackson LP**, and Gould KL. (2020). Opposite surfaces of the Cdc15 F-BAR domain create a membrane platform that coordinates cytoskeletal and signaling components for cytokinesis. *Cell Reports* 33(12): 108526.

Role: I supervised M Chandra (postdoctoral fellow) in determining the X-ray crystal structure of the Cdc15 F-BAR domain. I supported key biophysical experiments on our small volume ITC instrument. I helped conceive structure-based mutants, biochemical, and biophysical experiments, and I assisted in manuscript writing, revising, and editing. This work was partially supported by my NIH NIGMS R35.

18. Chandra M†, Kendall AK, and **Jackson LP**†. (2020). Unveiling the cryo-EM structure of Retromer. *Biochemical Society Transactions* 48(5): 2261-2272. (†corresponding authors)

Role: I co-wrote this invited article based on new single particle cryoEM structures generated in my lab. M Chandra (postdoc) and A Kendall (lab manager) co-wrote this perspective on retromer structure and function with me.

17. Crawley-Snowdon H, Yang J-C, Zaccai NR, Davis L, Wartosch L, Herman EK, Bright NA, Swarbrick JS, Collins BM, **Jackson LP**, Seaman MNJS, Luzio JP, Dacks JB†, Neuhaus D†, Owen DJ†. (2020). Mechanism and evolution of the Zn-fingernail required for interaction of VARP with VPS29. *Nature Communications* 11(1):5031. (†joint corresponding authors)

Role: I conducted initial structural and biophysical experiments on the VARP Zn fingernail as a postdoc in the Owen lab in 2012-2013. I assisted in manuscript writing and editing.

16. Gadbery JE*, Abraham A*, Needle C, Moth C, Sheehan J, Capra JA, **Jackson LP**. (2020). Integrating Structural and Evolutionary Data to Interpret Genetic Variation and Pathogenicity in Adaptor Protein Complex 4 (AP-4). *Protein Science* 29 (6):1535-1549. (*joint first authors)

Role: I conceived this project in collaboration with Tony Capra. I supervised JE Gadbery (postdoc) and C Needle (undergraduate) in building AP-4 homology models and analyzing patient pathogenic mutations. We collaborated with the Capra laboratory to investigate AP-4 through the lens of evolutionary history and human diversity. A Abraham (graduate student, Capra lab) undertook computational analyses, with support from J Sheehan and C Moth. This work was supported by my NIH NIGMS R35 grant.

15. Kendall AK, Xie B, Xu P, Wang J, Burcham B, Frazier MN, Binshtein E, Wei H, Graham TR, Nakagawa T, **Jackson LP**. (2020). Mammalian retromer is an adaptable scaffold for cargo sorting from endosomes. *Structure* 28(4):393-405.e4. (Featured on journal cover and in Preview article.)

Role: I conceived and supervised this project; assisted in structure determination; carried out refinement; and wrote the manuscript. AK Kendall and I determined structures. I supervised biochemical experiments carried out by graduate students (B Xie, R Burcham, MN Frazier, J Wang). Yeast experiments were conceived and carried out with help from the Graham lab. E Binshtein, H Wei and T Nakagawa provided EM data collection and processing expertise. This project was supported by my grants from NIH NIGMS (R35) and the Pew Charitable Trusts and was featured in a Preview article (Martínez-Núñez L & Munson M. Retro is cool: Structure of the Versatile Retromer Complex. *Structure* 28: 387-389.) We received multiple invitations to write perspective pieces based on the structures observed in this work.

14. Davies AK, Itzhak DN, Edgar JR, Archuleta TL, Hirst J, **Jackson LP**, Robinson MS, and Borner GHH. (2018). AP-4 vesicles contribute to spatial control of autophagy via RUSC-dependent peripheral delivery of ATG9A. *Nature Communications* 9(1): 3958.

Role: I supervised postdoc, TL Archuleta; provided key reagents (purified recombinant proteins); and undertook biochemical experiments to test interactions between purified AP4 proteins and RUSC proteins in cell lysates. I assisted in proofing and revising the paper. This work was partially supported by my NIH NIGMS R35.

13. Xu P, Hankins HM, Macdonald C, Erlinger SJ, Frazier MN, Diab NS, Piper RC, **Jackson LP**, MacGurn JA, and Graham TR. (2017). COPI mediates recycling of an exocytic SNARE from endosomes by recognition of a ubiquitin sorting signal. *eLife* 6:e28342.

Role: I supervised graduate student, MN Frazier, and generated and provided key reagents including wild-type and mutant plasmids, and purified recombinant wild-type and mutant proteins. I helped conceive experiments and contributed structural and biochemical experiments. I assisted in manuscript writing, revising, and editing. This work was partially supported by my NIH NIGMS R35.

12. Archuleta TL*, Frazier MN*, Monken A, Kendall AK, Harp J, McCoy AJ, Creanza N, and **Jackson LP**. (2017). Structure and evolution of ENTH and VHS/ENTH-like domains in tepsin. *Traffic* 18(9):590-603. (*joint first authors)

Role: I conceived this project and supervised multiple trainees including graduate student, MN Frazier, postdoc, TL Archuleta, and undergraduate, A Monken. I purified proteins and assisted in X-ray structure determination. I established a collaboration with Nicole Creanza to undertake phylogenetics and comparative genomics of tepsin. I wrote the manuscript with input from co-authors. This work was supported by two of my grants (R35 NIH NIGMS; Pew Charitable Trusts).

11. Frazier MN, Davies AK, Voehler M, Kendall AK, Borner GH, Chazin WJ, Robinson MS, and **Jackson LP**. (2016). Molecular basis for the interaction between Adaptor Protein Complex 4 (AP4) β4 and its accessory protein, tepsin. *Traffic* 17(4):400-415.

Role: I conceived this project; carried out initial biochemical and biophysical experiments; supervised graduate student, MN Frazier; and wrote the manuscript. Our collaborators (Robinson lab, Cambridge) used our reagents and results to conduct experiments in cell lines developed in their lab. This work was supported by my Vanderbilt faculty funds.

10. **Jackson LP**. (2014). Structure and mechanism of COPI vesicle biogenesis. *Curr Opin Cell Biol* 29:67-73. (Invited review.)

Role: I conceived and wrote this manuscript.

Postdoctoral, graduate, & undergraduate publications

9. Hesketh GG*, Pérez-Dorado I*, **Jackson LP**, Wartosch L, Schäfer IB, Gray SR, McCoy AJ, Zeldin OB, Garman EF, Harbour ME, Evans PR, Seaman MN, Luzio JP, Owen DJ. (2014). VARP is Recruited Onto Endosomes by Direct Interaction with Retromer, Where Together They Function in Export to the Cell Surface. *Developmental Cell* 29(5):591-606. (*joint first authors)

Role: I expressed and purified recombinant proteins and conducted all biochemical experiments. I verified a direct biochemical interaction between VARP and retromer; tested multiple VARP and VPS29 structure-based mutants to map the binding patch on both proteins; showed a VARP/retromer complex can interact simultaneously with Rab32 and VAMP7.

8. **Jackson LP**†, Lewis M, Kent HM, Edeling MA, Evans PR, Duden R, and Owen DJ†. (2012). Molecular basis for recognition of dilysine trafficking motifs by COPI. *Developmental Cell* 23(6):1255-62. (†corresponding authors)

Role*:* I determined multiple X-ray crystal structures of the β'-COP subunit with dilysine motifs; generated structure-based mutants; conducted all calorimetry experiments. I generated all figures and wrote the manuscript with supervision from DJ Owen (postdoctoral advisor).

7. **Jackson LP**†, Kümmel D†, Reinisch K, and Owen DJ. (2012). Structures and mechanisms of vesicle coat components and multisubunit tethering complexes. *Current Opinion in Cell Biology* 24(4):475-83. (†corresponding authors)

Role*:* I co-wrote this invited review with D Kümmel with input from K Reinisch and DJ Owen.

6. Borner GHH, Antrobus R, Hirst J, Bhumbra GS, Kozik P, **Jackson LP**, Sahlender DA, and Robinson MS. (2012). Multivariate proteomic profiling identifies novel accessory proteins of coated vesicles. *Journal of Cell Biology* 197(1):141-60.

Role*:* I provided purified recombinant proteins to test a direct interaction between AP-4 appendage domains and the newly characterized binding partner, tepsin.

5. **Jackson LP***, Kelly BT*, McCoy, AJ, Gaffry, T, James LC, Collins BM, Höning S, Evans PR, Owen DJ. (2010). A large scale conformational change couples membrane recruitment to cargo binding in the AP2 clathrin adaptor complex. *Cell* 141, 1220-29. (*joint first authors)

Role*:* I crystallized and determined an X-ray crystal structure of AP-2 in complex with cargo peptides. I expressed and purified recombinant proteins for biophysical studies, which were conducted by the co-first author. I assisted in manuscript writing, editing, and figure making.

4. Pryor PR, **Jackson LP**, Gray SR, Edeling MA, Thompson A, Sanderson CM, Evans PR, Owen DJ, Luzio JP. (2008). Molecular basis for the sorting of the SNARE VAMP7 into endocytic clathrin-coated vesicles by the ArfGAP Hrb. *Cell* 134, 817-27.

Role: I crystallized and determined the X-ray structure of the VAMP7/Hrb complex; introduced structure-based point mutations; and conducted all calorimetry experiments to quantify binding and confirm the interaction interface. This work constituted a major part of my Ph.D. thesis work.

3. **Parker L**, Kendall A, Berger, PH, Shiel, PJ, and Stubbs, G. (2005). Wheat streak mosaic virus—Structural parameters for a *Potyvirus*. *Virology* 340, 64-69 (featured on cover)

Role: I generated oriented sols of wheat streak mosaic virus (WSMV) for fiber diffraction studies.

2. Stubbs G, **Parker L**, Junn J, and Kendall, A. (2005). Flexible filamentous virus structures from fiber diffraction. *Fiber Diffraction Review* 13, 38-42

Role: I assisted in manuscript writing.

1. **Parker L**, Kendall A, and Stubbs, G. (2002). Surface Features of Potato Virus X from Fiber Diffraction. *Virology* 300, 291-5 (featured on cover)

Role: I generated oriented sols of potato virus X (PVX) and collected fiber diffraction patterns.

<u>Editorial and perspective articles</u>

2. **Jackson LP**. (2019). Overview: Traffic at atomic resolution. *Traffic* 20(12):889.

Role: I served as guest editor for a special issue in *Traffic* focusing on recent advances in understanding molecular details of cellular trafficking processes. The series included seven peer-reviewed articles from international experts across the USA and Europe. I invited all written submissions; oversaw peer review (including selecting external reviewers, evaluating manuscripts after receiving reviewer reports, and communicating with authors); and wrote this editorial piece highlighting the issue.

1. Frazier MN and **Jackson LP**. (2017). Spotlight: Watching real-time endocytosis in living cells. *Journal of Cell Biology* 216(1):9-11.

Role: I co-wrote this "Spotlight" with graduate student MN Frazier; we highlighted important new work featured in a paper from the Schmid lab (UT Southwestern)

Fellowships and grants

Current research grants

1. NIH/NIGMS R35GM119525 (PI: LP Jackson)
"Molecular mechanisms of coat protein assembly and regulation in membrane trafficking"
Role: Principal Investigator
Sept 2016-May 2022; Budget: $250,000/year ($1,250,000 direct; $691,580 indirect costs) (NCE)

Two supplement awards
1B. NIH/NIGMS 3R35GM119525-05S1 (PI: LP Jackson)
"The molecular role of tepsin in membrane trafficking pathways"
Role: Principal investigator
June 2020-May 2021; Budget: $49,121 direct; $28,490 indirect costs

1A. NIH/NIGMS 3R35GM119525-01S1 (PI: LP Jackson)—diversity supplement
"Molecular mechanisms of coat protein assembly and regulation in membrane trafficking"
Role: Principal Investigator
Sept 2016-May 2017; Budget: $21,520 direct costs; $12,266 indirect costs

2. NIH/NCI R01CA224188 (PI: Yashi Ahmed, Dartmouth; Vanderbilt PI: Ethan Lee)
"Targeting the Wnt Receptor Complex in APC-deficient Colorectal Cancers"
Role: Collaborator (5% total effort)
July 2020-June 2025; total direct costs to Vanderbilt: $625,000 ($125,000 in years 1-5)

Research grant under review
1. Renewal: NIH/NIGMS R35GM119525 (PI: LP Jackson)
"Molecular mechanisms of coat protein assembly and regulation in membrane trafficking"
Role: Principal Investigator
April 2022-March 2027; requested budget: $400,000/year ($2,000,000 direct; $1,138,000 indirect)
Submission date: May 17, 2021; MRAC study section review Nov 1-2, 2021

Completed research grants
1. NIH/NIGMS R01GM1184532 (PI: Todd Graham)
"Mechanisms of protein transport between Golgi and endosomes"
Role: Collaborator (12.1% effort: 5% annual year & 33% summer)
July 2016-April 2021; Budget: $10,472

2. Pew Scholars Award, Pew Charitable Trusts (PI: LP Jackson)
"Coat protein function in membrane trafficking and human disease"
Role: Principal Investigator
August 2016-2020; Budget: $285,000 total costs

3. Vanderbilt Reinvestment Award (PI: Teru Nakagawa)
"A Reinvestment in Cryo-Electron Microscopy at Vanderbilt"
Role: Faculty participant
July 2017-June 2018; Budget: $2,464,284

4. Vanderbilt University Beckman Scholars Program, Arnold and Mabel Beckman Foundation
Role: Associate Director
June 2016-August 2020; Budget: $156,000 (no effort allowance)

5. S10 Shared Instrumentation Grant Program (PI: Ben Spiller)
"NanoTemper Monolith NT.115 Microscale Thermophoresis (MST) instrument"
Role: Key Person/Future User

Invited presentations

Dept. of Biochemistry & Molecular Pharmacology, Univ. of Massachusetts. Amherst MA. April 2022.
Support: honorarium and travel
Title: Mechanisms of coat assembly & regulation in membrane trafficking.

Dept. of Pathology, Children's Hospital of Philadelphia. Philadelphia, PA. November 2021.
Support: honorarium
Title: Mechanisms of coat assembly & regulation in membrane trafficking.

Linton Traub Memorial Symposium. Department of Cell Biology, Univ. of Pittsburgh. October 2021.
Support: travel
Title: An interaction between β'-COP and the ArfGAP, Glo3, maintains post-Golgi cargo cycling

Dept. of Biological Chemistry, University of Michigan, MI. Sept 2020.
Support: honorarium
Title: Mechanisms of coat assembly & regulation in membrane trafficking

Dept. of Biochemistry, University of Washington. Seattle, WA. May 2020. Canceled, COVID-19.
Support: travel & hotel
Title: Mechanisms of coat assembly & regulation in membrane trafficking.

Dept. of Chemistry, Dartmouth College. Hanover, NH. July 2019.
Support: travel & hotel
Title: Mechanisms of coat assembly & regulation in membrane trafficking.

Dept. of Cellular Biochemistry, University Medical Center Göttingen. Göttingen, Germany. June 2019.
Declined, travel restrictions during pregnancy

Vanderbilt Dept. of Biochemistry Retreat. February 2018. Nashville, TN.
Selected from abstracts
Title: Architecture of mammalian retromer by electron microscopy.

Cornell University, Biophysics Colloquium Series. November 2017. Ithaca, NY.
Support: travel & hotel
Title: Mechanisms of coat assembly & regulation in membrane trafficking.

Flexner Discovery Lecture, Vanderbilt University Medical Center. Sept 2017. Nashville, TN.
Title: Membrane trafficking proteins in cell biology and human disease.

Vanderbilt Molecular Biophysics Training Program. May 2017. Nashville, TN.
Title: Mechanisms of coat assembly & regulation in membrane trafficking.

Vanderbilt Dept. of Biochemistry Retreat. February 1, 2017. Nashville, TN.
Title: Structures of the tepsin ENTH & VHS-like domains in membrane trafficking.

Vanderbilt Center for Structural Biology, External Advisory Board Meeting. December 2016. Nashville, TN.
Title: Membrane trafficking proteins in cell biology and human disease.

Vanderbilt University Medical Center, Biomedical Science Advisory Board Meeting. December 2016. Nashville, TN.
Title: Membrane trafficking proteins in cell biology and human disease.

Vanderbilt Dept. of Biological Sciences Annual Retreat. October 2015. Nashville, TN.
Faculty keynote lecture
Title: Molecular mechanisms of coated vesicle assembly.

Epithelial Biology Center Symposium, Vanderbilt University. May 2015, Nashville, TN.
Title: A retromer/VARP complex sorts VAMP7 at endosomes.

Frontiers in Biochemistry, Vanderbilt Dept. of Biochemistry. December 2014, Nashville, TN.
Title: Mechanisms of coat assembly in post-Golgi trafficking.

Tennessee State University Dept. of Biological Sciences. November 2014, Nashville, TN.
Title: Mechanisms of coat assembly in post-Golgi trafficking.

Vanderbilt Association of Biology Students, Dept. of Biological Sciences. April 2014, Nashville, TN.
Title: Molecular mechanisms of vesicle assembly in membrane trafficking pathways.

Vanderbilt Molecular Biophysics Training Program. February 2014, Nashville, TN.
Title: Molecular mechanisms of vesicle coat assembly in membrane trafficking.

Cambridge Institute for Medical Research Annual Retreat. March 2013, Cambridge, UK.
Title: Molecular basis for dilysine cargo recognition by COPI.

Vanderbilt University Dept. of Biological Sciences. January 2013, Nashville, TN.
Support: travel & hotel; job interview.
Title: Mechanisms of cargo sorting in membrane trafficking pathways.

University of Pittsburgh Dept. of Biological Sciences. January 2013, Pittsburgh, PA.
Support: travel & hotel; job interview.
Title: Mechanisms of cargo sorting in membrane trafficking pathways.

Vanderbilt University Department of Biological Sciences. August 2011, Nashville, TN.
Title: Structural basis for endocytic cargo recognition at the plasma membrane.

UK membrane trafficking meeting. December 2009, London, UK. (Selected from abstracts)
Title: Structure and function of AP2 at the plasma membrane.

Conference presentations

FASEB Phospholipids Meeting. August 2022. Jupiter, FL.

62nd Symposium, Advances in Biological Regulation. Oct 3-5, 2021. Bologna, Italy.
(Hybrid meeting; virtual presentation.)
Title: Structure and function of tepsin in AP-4 coated vesicles

Molecular Membrane Biology Meeting. July 19-20, 2021. Online meeting.
(Organized by GRC Chair following GRC meeting cancellation; talk selected from abstracts.)
Title: An interaction between β'-COP and its ArfGAP, Glo3, maintains post-Golgi cargo sorting

Pew Scholars Virtual Meeting. March 25, 2021.
Title: Coat assembly & regulation in membrane trafficking

Royal Society Hooke Discussion Meeting. Nov 2020. London, UK.
Support: travel & hotel; moved online due to COVID-19
Title: Endosomal coat assembly and regulation in neurodegeneration

61st Symposium, Advances in Biological Regulation. Oct 2020. Bologna, Italy.
Support: hotel; moved online due to COVID-19.
Title: An interaction between β'-COP & Glo3 is required to maintain post-Golgi cargo recycling

FASEB Phospholipids Meeting, Steamboat Springs, CO. August 2020.
Support: travel; canceled due to COVID-19.

Pew Scholars Annual Meeting. March 2020. Bermuda.
Support: travel & hotel; canceled due to COVID-19.

Biophysical Society Annual Meeting, Exocytosis & Autophagy session. Feb 2020. San Diego, CA.
Support: hotel
Title: Retromer is an adaptable plastic scaffold for cargo sorting from endosomes.

60th Symposium, Advances in Biological Regulation. Oct 2019. Bologna, Italy.
Support: hotel; declined because of parental leave.

Gordon Research Conference on Molecular Membrane Biology. July 2019, Andover, NH.
(Selected from abstracts)
Title: Retromer is an adaptable plastic scaffold for cargo sorting from endosomes.

ASCB/EMBO Annual Meeting. Dec 2018. San Diego, CA.
(Selected from abstracts)
Title: Architecture of mammalian retromer by cryo-electron microscopy.

Pittsburgh Local Traffic Meeting. May 2018. Pittsburgh, PA.
Support: travel & hotel
Title: Architecture of mammalian retromer by electron microscopy.

38th Steenbock Symposium. June 2017. Madison, WI.
(Selected from abstracts)
Title: Structure and evolution of ENTH and VHS/ENTH-like domains in tepsin.

Pew Scholars Annual Meeting. March 6, 2017. Santa Barbara, CA.
Support: travel & hotel
Title: Mechanisms of vesicle coat assembly in cell biology and human disease.

Gordon Research Conference on Molecular Membrane Biology. July 2013, Andover, NH.
Support: GRC travel award; selected from abstracts
Title: Molecular basis for recognition of dilysine-based cargo by the COPI coat.

The Protein Society 25th anniversary symposium. July 2011, Boston, MA.
Support: Protein Society travel award; selected from abstracts
Title: Structure and function of AP2 at the plasma membrane.

Gordon Research Conference on Lysosomes and Endocytosis. June 2010, Andover, NH.
Support: registration fee
Title: Structure and function of AP2 at the plasma membrane.

Published abstracts and poster presentations

19. Kendall AK, Xie B, Frazier MN, Wang J, Burcham R, Binshtein E, Collier S, Wei H, Potter C, Carragher B, Nakagawa T, and **Jackson LP**. Architecture of mammalian retromer by single particle cryoEM.

- FEBS Golgi Meeting, Sorrento, Italy. October 2018.
- Purdue Cryo-EM Symposium, West Lafayette, IN. November 2018.
- ASCB/EMBO meeting, San Diego, CA. December 2018
- Pew annual meeting, Sarasota, FL. March 2019.

18. Burcham RB, Kendall AK, Xu P, Binshtein E, Collier S, Graham T, and **Jackson LP**. Architecture of mammalian retromer by electron microscopy. Pew Annual Meeting, Dove Mountain, AZ, March 2018.

17. Droege K, Eichman B, **Jackson LP**, Singleton C, and Brame CJ. Case-study homework format in a biochemistry course increases students' final exam performance and interest in course material. Society for the Advancement of Biology Education Research, Minneapolis, Minnesota, July 2017.

16. Archuleta TA, Frazier MN, Monken AE, Kendall AK, Creanza N, and **Jackson LP**. (2017). Structure and evolution of ENTH and VHS/ENTH-like domains in tepsin.

- 38th Steenbock Meeting, Madison, WI
- Gordon Research Conference, Molecular Membrane Biology, Andover, NH

15. Frazier MN, Davies AK, Voehler M, Borner GHH, Chazin W, Robinson MS, **Jackson LP**. (2016). Molecular basis for the interaction between AP4 β4 and its accessory protein, tepsin. Gordon Research Conference, Lysosomes & Endocytosis, Andover, NH.

14. Xu P, Hankins HM, Macdonald C, MacGurn JA, **Jackson LP**, Piper RC, Graham TR. (2016). COPI sorts ubiquitinated cargo at early endosomes. Cell Dynamics Symposium, Nashville, TN.

13. Xu P, Hankins HM, Diab NS, Erlinger SJ, MacGurn JA, **Jackson LP**, and Graham TR. (2016). COPI sorts ubiquitinated membrane proteins at early endosomes. 23rd Annual Southeastern Regional Yeast Meeting, Tuscaloosa, AL.

12. Frazier MN, Davies AK, Voehler M, Borner GHH, Robinson MS, **Jackson LP**. (2015). Molecular basis for the interaction between AP4 and its accessory protein tepsin. Gordon Research Conference on Molecular Membrane Biology, Andover, NH.

11. Xu P, MacGurn JA, **Jackson LP**, and Graham TR. (2015). COPI sorts ubiquitinated membrane proteins at early endosomes. Gordon Research Conference, Molecular Membrane Biology, Andover, NH.

10. **Jackson LP**, Hesketh GG, Crawley-Snowdon H, Pérez-Dorado I, Wartosch L, Schäfer I, Luzio JP, Seaman MNJ, Owen DJ. Retromer recruits VARP onto endosomes and mediates VAMP7 trafficking.
- 13th Annual Symposium on Membrane Traffic, Pittsburgh, PA (May 2014)
- Gordon Conference on Lysosomes and Endocytosis, Andover, NH (June 2014)

9. **Jackson LP**, Lewis M, Kent HM, Evans PR, Duden R, and Owen DJ. (2013). Molecular basis for dilysine cargo sorting by the COPI coat. Gordon Research Conference on Molecular Membrane Biology, Andover, NH.

8. **Jackson LP**, Kelly BT, McCoy A, Höning S, Evans PR, and Owen DJ. An open and active form of AP2 couples membrane binding to cargo recognition and binding.
- Keystone Symposium, Structural Biology of Cellular Processes, Keystone, CO (2012)
- Protein Society, 25th Anniversary Symposium, Boston, MA (2011)
- Gordon Conference on Lysosomes and Endocytosis. Andover, NH (2010)

7. Evans P, Owen D, Kelly B, McCoy A, and **Jackson L**. (2009). The Recognition of Endocytic Signal Sequences by the AP2 Complex. 25th European Crystallographic Meeting, ECM 25, Istanbul, Turkey. *Acta Cryst* A**65** (supplemental).

6. **Parker L**, Kent, H, and Evans, P. (2006). Biophysical and Structural Characterization of Adaptor-related Protein Complex 4. American Crystallographic Association Annual Meeting, Honolulu, HI.
5. Kendall A, Francica J, Junn J, Montague L, **Parker L**, and Stubbs G. (2005). Flexible filamentous plant virus structures by fiber diffraction and crystallography. American Crystallographic Association Annual Meeting, Orlando, FL.

4. Stubbs G, Bunick C, Kendall A, and **Parker L**. (2003). Structural Studies of Flexible Filamentous Plant Viruses by Fiber Diffraction and Crystallography. American Crystallographic Association Annual Meeting, Cincinnati, OH.

3. **Parker L**. Fiber Diffraction Studies of Potexviruses and Potyviruses. October 4, 2002. Pfizer Summer Undergraduate Research Fellowship Poster Session, Groton, CT.

2. Stubbs G, Kendall A, Lynch K, **Parker L**, Taraska N, Kondrashkina E, and Irving T. (2002). Fiber diffraction studies of potato virus X on the BioCAT beamline at the Advanced Photon Source. Eleventh Annual Fibre Diffraction and Non-Crystalline Diffraction Workshop, Keele, UK.

1. Stubbs G, Kendall A, Lynch K, **Parker L**, and Taraska N. (2002). Fiber diffraction studies of potato virus X. American Crystallographic Association, San Antonio, TX.

Teaching & Mentoring

New courses introduced

Biochemistry II (BSCI4265): Spring 2019, Spring 2021
- Role: Instructor
- I developed and introduced a new course on for undergraduate and graduate students

Undergraduate Seminar in Membrane Biochemistry (BSCI3965): Spring 2017, Spring 2018
- Role: Instructor
- I developed and introduced a new undergraduate seminar

Additional courses taught

Biochemistry I (BSCI2520/5890): Spring 2015, Fall 2015, Fall 2016, Fall 2017, Fall 2018, Fall 2020, Fall 2021
- Role: Co-instructor
- Spring 2015: updated lecture course
- Fall 2020: developed modular online course due to COVID-19 restrictions
- Fall 2021: delivered "flipped" modular course
- Enrollment: 60-160 students (2015-2021); undergraduate and graduate students

Directed lab research (BSCI3861): Spring 2021
- Role: Instructor

Molecular Biophysics Journal Club (BCHM349): Spring 2015, Spring 2017, Spring 2018, Spring 2020
- Role: Guest faculty lecturer

Independent Reading (BSCI282): Spring 2015
- Role: Instructor

Seminar in Biological Sciences (BSCI320): Fall 2014
- Role: Instructor

Chemical & Physical Biology (CPB306): Fall 2014, Fall 2015, Fall 2018
- Role: Guest faculty lecturer (2 lectures)

Bioregulation I guest lectures: Fall 2018
- Role: Guest faculty lecturer (2 lectures)

BCHM8327 (Seminar/Scientific Communication)
- Role: faculty reviewer

Supervisions, Natural Sciences, University of Cambridge
- Molecules in Medical Science (Trinity College, 2004-2005)
- Biology of Cells (Jesus College, 2009-2013)

Postdoctoral trainees

Tara Archuleta, Ph.D. (2014-2017)
- Vanderbilt Functional Neurogenomics training grant T32MH65215-12 (July 2014-2016)
- Awarded Minority Supplement to NIH/NIGMS R35GM119525 (Feb-July 2017)

John Gadbery, Ph.D. (Dec 2018-present)
- Vanderbilt Functional Neurogenomics training grant T32MH65215-12 (June 2020-present)

Mintu Chandra, Ph.D. (2019-present)
- Pearson Fellowship ($30,000), Vanderbilt Dept. of Biochemistry (2019)

Graduate students

Meredith Frazier, Ph.D. (2014-2018)
- Vanderbilt Molecular Biophysics training grant T32GM008320 (2014-2016)
- Ann Bernard Martin Award for Excellence in Graduate Research (2015)
- Karpay Award in Structural Biology (2018)
- Graduate Student Research Excellence Award in Biological Sciences (2018)

Rodger Burcham, M.S. (2015-2018)

Betty Xie (2016-present)
- Commendation for Graduate Student Research Excellence Award (S2021)
- Successfully defended thesis (August 2021)

Natalie Wallace (2017-present)
- Vanderbilt Molecular Biophysics training grant T32GM008320 (2017-2019)
- Hickory Stick Award, Dept. of Biological Sciences (2020)

Undergraduate research projects supervised
- Ommay Farah (fall 2021-present)
- Andrew Engel (fall 2020-present): one co-authored publication; VUSRP fellowship (summer 2021)
- Olivia Pembridge (2019-present): VUSRP Goldberg Fellow (summer 2021); MCB Honor's Thesis (2021-22)
- Carli Needle (2017-present): one co-authored publication
- Christian Jung (2017-2020): BCB Honor's Thesis; one co-authored publication; VUSRP fellowship
- Melissa Kumi (fall 2019)
- Ana Paula Vargas Ruiz (spring 2019, REPU intern)
- Aria Sajjad (fall 2018)
- Oceane Parker (2017-18)

- Luwi Shamambo (summer 2017, Vanderbilt Summer Minority Research Program)
- Katelyn Reneslacis (spring 2017, fall 2017)
- Anderson Monken (2015-2018): one co-authored publication; Chemistry Honor's Thesis; VUSRP Littlejohn Research Scholar (2016); Beckman Scholar finalist (2016); accepted into NIH OxCam program (declined)
- Allison Isabelli (2017-2017)
- Jeffrey Yung (2015-2016)

Graduate rotation students

- Meredith Frazier, Interdisciplinary Graduate Program, spring 2014
- Rodger Burcham, Biological Sciences, fall 2014 and spring 2015 (2 rotations)
- Lauren Salay, Interdisciplinary Graduate Program, spring 2015
- Mark dela Cerna, Chemical & Physical Biology, spring 2015
- Brennica Marlow, Chemical & Physical Biology, fall 2015
- Betty Xie, Biological Sciences, spring 2016
- Manuel Castro, Interdisciplinary Graduate Program, fall 2016
- Natalie Wallace, Interdisciplinary Graduate Program, fall 2016
- Alyssa Rodriguez, Interdisciplinary Graduate Program, spring 2017
- Noah Bradley, Interdisciplinary Graduate Program, spring 2017
- Emily Linton, Interdisciplinary Graduate Program, spring 2018
- Kaylee Johnson, Interdisciplinary Graduate Program, spring 2018
- Jue (Phyllis) Wang, Chemical & Physical Biology, fall 2018
- Ivette Perez, Interdisciplinary Graduate Program, fall 2018
- Alec Brown, Biological Sciences, fall 2018
- Matthew Petrovich, Biological Sciences, spring 2020
- Deanna Bowman, Interdisciplinary Graduate Program, spring 2020
- Valeria Garcia Lopez, Biological Sciences, fall 2020
- Andrew Dixson, Interdisciplinary Graduate Program, fall 2020
- Sarah Zelle, Interdisciplinary Graduate Program, fall 2020
- Malek Jacobs, Interdisciplinary Graduate Program, fall 2020

Ph.D. dissertation committees

- Mariana Jimenez, Neuroscience (Graham lab, 2021-present)
- Min Soo Kim, Chemical & Physical Biology Program (Plate lab, 2021-present)
- Matthew Petrovich, Biological Sciences (Eichman lab, 2021-present)
- Cait Kirby, Biological Sciences (Patel lab, 2020-2021)
- Hannah Nelson, Biological Sciences (Patton lab, 2020-present)
- Andrew Morris, Biochemistry (Ren lab, 2018-2020)
- Claire Strothman, Cell & Developmental Biology (Zanic lab, 2017-2021)
- Diego del Amado, Chemistry (Meiler/Mchaourab labs, 2017-2021)
- Justin Marinko, Biochemistry (Sanders lab, 2017-2020)
- Bryan Gitschlag, Biological Sciences (Patel lab, 2016-2021)
- Jordan Best, Biological Sciences (Graham lab, 2016-2020)
- Scott Hinger, Biological Sciences (Patton lab, 2016-2019)
- Stephanie Carnes, Pathology, Microbiology, & Immunology (Aiken lab, 2016-2019)
- Garrett Warren, Biological Sciences (Eichman lab, 2015-2019)

- MariaSanta Mangione, Cell & Developmental Biology (Gould lab, 2015-2019)
- Mikin Patel, Biological Sciences (Webb & Weaver labs, 2015-2021)
- Jonathan Knowlton, Pathology, Microbiology, & Immunology (Dermody lab, 2015-2018)
- Kevin Kelly, Biological Sciences (Johnson lab, 2015-2019)
- Catherine Deatherage, Biochemistry (Sanders lab, 2015-2016)
- Cheryl Law, Biochemistry (Sanders lab, 2014-2019)
- Diana Tafoya, Biological Sciences (Eichman lab, 2014-2018)

Mentorship in research courses

- BSCI3860, Introduction to Research: spring 2017, fall 2018, fall 2019
- BSCI3861, Directed Laboratory Research: spring 2015, fall 2015, spring 2016, fall 2016, fall 2019, fall 2020
- BSCI3961, Independent Laboratory Research: spring 2017, spring 2021
- BCB3201, Undergraduate research: fall 2017, spring 2018, fall 2018, spring 2019
- BCB4999, Undergraduate honors research: fall 2019, spring 2020
- BSCI4999, Undergraduate honors research: fall 2021
- CHEM3860, Undergraduate research: fall 2015, spring 2016, fall 2016, fall 2017
- CHEM4980, Honor's research: fall 2016, spring 2017
- NSC3860, Introduction to Research: fall 2018
- NSC3861, Directed Laboratory Research: spring 2019
- NSC3862, Independent Laboratory Research: fall 2019

Graduate and postdoctoral fellowship mentoring

- Bartholomew Roland, NIH F32 Postdoctoral Fellowship, Role: Key Person/Consultant)
- Jonathan Knowlton, NIH F31 Fellowship (Dermody lab), Role: Key Person/Consultant)
- Stephanie Carnes, NIH F31 Fellowship (Aiken lab), Role: Key Person/Consultant

Service

Service to the Department of Biological Sciences

- Faculty search committee, Evolutionary Biochemistry (2021-22)
- IGP admissions committee (2018-2019, 2020-present)
- Faculty search committee, Biochemistry & Chemical Biology (2017-18)
- Curriculum committee (2015-2018)
- Participated in nine BSCI faculty searches (2014-2022)— seminars, chalk talks, dinners, 1-on-1 candidate meetings
- Hosted nine departmental seminar speakers (2014-2022)
- Undergraduate major advising: 8 BSCI/MCB majors
- Undergraduate honors committees: 8 MCB/BCB majors
- Faculty research co-mentor: 4 BSCI/MCB majors
- Letters of recommendation for ~60 undergraduate students (professional & graduate school)

Service to the College of Arts & Science

- Advisory Board, Biochemistry and Chemical Biology Program (2016-present)
- Margaret Cuninggim Women's Center Women in the Academy Panel. "How to Build a Professional Network." (January 2020).

- *Ad hoc* reviewer, Pew Biomedical Scholars Award LSO competition (summer 2018)
- Faculty VUceptor (2017-2018)
- Beckman Scholars Program, Associate Director (2016-2019)
- Presenter, Vanderbilt Biomedical Science Advisory Board Annual Meeting (December 2016)
- Research Night at Ingram Commons (fall 2014, fall 2016)

Service to Vanderbilt University

Center for Structural Biology
- CryoEM Financial Oversight Committee (2020-present)
- Steering committee member (2018-present)
- Faculty search committee, School of Medicine cryoEM search (2018-2019)
- Karpay Award selection committee (2015-2018), Co-chair (2017-2018)
- Presenter, CSB external advisory board meeting (2016)

Molecular Biophysics Training Program
- Steering Committee (2020-present)
- Education committee member (2018-present)
- Coordinator, Molecular Biophysics seminar series (2014-2015)
- Maintain, train users, and run isothermal titration calorimetry instrument for community

Vanderbilt Trafficking Club
- Series organizer (2018-2020)—monthly gathering of ~15 labs across VU and VU SOM departments
- 2020 Vanderbilt Trafficking Symposium Meeting organizer— one-day meeting of ~20 labs across VU and VU SOM departments with broad interests in membrane trafficking

Service to the profession
- *Ad hoc* grant reviewer: NIH Membrane Biology & Protein Processing Study Section (MBPP); Wellcome Trust (UK); Medical Research Council (UK), Deutsche Forschungsgemeinschaft (DFG)
- *Ad hoc* reviewer: *Nature Structural & Molecular Biology, eLife, Nature Communications, PLoS Biology, Science Advances, Nature Chemical Biology, Proc Natl Acad Sci U S A*, *Journal of Cell Biology, EMBO Journal, Journal of Biological Chemistry, Structure, Traffic, Wellcome Open, Trends in Biochemical Sciences, FEBS Letters*
- Discussion leader, 2020 Lysosomes & Endocytosis Gordon Research Conference (invited, travel & hotel supported; canceled due to COVID-19)
- Editorial Board Member, *Traffic* (2017-2020)
- Guest Editor, *Traffic* review series, "Trafficking at atomic resolution" (2019)
- External advisor, Alejandro Damasio Ph.D. thesis, Ragusa lab, Dept. of Chemistry, Dartmouth College (July 2019)
- F1000 contributing faculty member, Cell Signaling & Trafficking Structures (2018-2020)
- Chair, Science Session I, 2018 Pew Annual Meeting
- Member, Planning Committee, 2018 Pew Annual Meeting
- Table leader, "Women in Science", ASCB/EMBO annual meeting (Dec 2018)
- *Ad hoc* reviewer, book chapter in "Biomolecular and Bioanalytical Techniques: Theory, Methodology and Applications", Wiley (UK)
- *Ad hoc* reviewer for Stanford Synchrotron Radiation Light Source (SSRL)

- Member, Biophysical Society, 2016-present
- Member, American Society for Cell Biology (ASCB), 2015-present

Service to the Nashville community

Abintra Montessori School
COVID Advisory Board (2020-present)—ongoing scientific advice to support administration; established and reviewed COVID-19 protocols; advised on exclusions and classroom closings

Nashville Symphony
- Education & Community Engagement Committee (2018-present)
- Associate Board of Directors (2016-18)
- Crescendo Club: board member (2014-16); Vice President of Strategic Partnerships (2015-2016)

Cheekwood Estate & Gardens
- Cheekwood Society (2018-present)
- Cheekwood Family Council (2018-present)

Philanthropy
- Second Harvest Food Bank (2015-present)
- Tocqueville Society, United Way (2015-present)
- Frist Art Museum (2016-present)
- Tennessee Performing Arts Center (2021-present)