Curriculum Vitae

Todd R. Graham, Ph. D.
Professor of Biological Sciences
Professor of Cell and Developmental Biology
Vanderbilt University

CURRENT ADDRESS:
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DATE AND PLACE OF BIRTH:
April 22, 1961; St. Louis, MO

COMMUNICATION LINES
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EDUCATION:

B.S. in Chemistry, 1984, Maryville College, St. Louis, MO
Ph.D. in Cell and Molecular Biology, 1988, St. Louis University, St. Louis, MO

BACKGROUND:

10/83-2/84	Food and Drug Administration, St. Louis, MO, Chemist
8/84-6/88	NIH predoctoral trainee, St. Louis University, St. Louis, MO, with Dr. Arnold Kaplan
6/88-7/89	NIH postdoctoral trainee, St. Louis University, St. Louis, MO, with Dr. Arnold Kaplan
8/89-10/91	American Cancer Society postdoctoral fellow, California Institute of Technology, Pasadena, CA, with Dr. Scott Emr
10/91-10/92	American Cancer Society postdoctoral fellow, Howard Hughes Medical Institute, University of California, San Diego, La Jolla, CA, with Dr. Scott Emr
11/92-9/99	Assistant Professor of Molecular Biology, Vanderbilt University, Nashville, TN.
9/99-8/00	Associate Professor of Molecular Biology, Vanderbilt University, Nashville, TN.
9/00-8/06	Associate Professor of Biological Sciences, Vanderbilt University, Nashville, TN.
9/06-present	Professor of Biological Sciences (primary), Vanderbilt University, Nashville, TN
12/07-present	Professor of Cell and Developmental Biology (secondary), Vanderbilt University

HONORS AND AWARDS:

Award for Excellence in Mathematics/Science, Maryville College, St. Louis, MO (1984)
Honors graduate magna cum laude, Maryville College, St. Louis, MO (1984)
Phi Beta Kappa, St. Louis University (1988)
American Cancer Society postdoctoral fellowship, California Institute of Technology (1989-1991)
National Science Foundation CAREER award, MCB-9600835, Vanderbilt University (9/96 - 8/00)
Interdisciplinary Graduate Program "Teacher of the Year" (2004)
Vanderbilt University College of Arts and Science "Excellence in Graduate Mentoring" award (2009)
Vanderbilt University "Chancellor's Award for Research" 2010
National Institutes of Health, MBPP study section regular member. 2010 – 2014

PUBLICATIONS:

57. Hankins, H.M., R.D. Baldridge, P. Xu and T.R. Graham (2014) Role of Flippases, scramblases and lipid transfer proteins in phosphatidylserine subcellular distribution. (Submitted)

56. Zhou, X., T.T. Sebastian and T.R. Graham (2013) Auto-inhibition of Drs2p, a Yeast Phospholipid Flippase, by its Carboxyl-Terminal Tail. J. Biol. Chem. 288:31807-15

55. Xu, P., R.D. Baldridge, R.J. Chi, C.G. Burd and T.R. Graham (2013) Phosphatidylserine flipping enhances curvature and charge required for vesicular transport. J. Cell Biol. 202:875-86

54. Baldridge, R.D., P. Xu and T.R. Graham (2013) Type IV P-type ATPases distinguish mono- versus di-acyl phosphatidylserine using a cytofacial exit gate in the membrane domain. J. Biol. Chem. 288:19516-19527

53. Graham, T.R. (2013) Arl1 gets into the membrane remodeling business with a flippase and ArfGEF. Proc Natl Acad Sci USA, 110:2691-2

52. Baldridge, R.D. and T.R. Graham (2013) Two gate mechanism for phospholipid selection and transport by P4-ATPases. Proc Natl Acad Sci USA, 110:E358-67

51. Sebastian, T.T., R.D. Baldridge, P. Xu and T.R. Graham (2012) Phospholipid flippases: building membrane asymmetry and transport vesicles. Bioch. Biophys Acta. 1821(8):1068-77

50. Baldridge, R.D. and T.R. Graham (2012) Identification of residues defining phospholipid flippase substrate specificity of type IV P-type ATPases. Proc. Natl. Acad. Sci. USA. 109(6):E290-8

49. Brett, C.L., L. Kallay, Z. Hua, R. Green, A. Chyou, Y. Zhang, T.R. Graham, M. Donowitz, R. Rao. (2011) Genome-wide analysis reveals the vacuolar pH-stat of *Saccharomyces cerevisiae*. PLoS One 6:e17619

48. Zhou, X., K. Liu, P. Natarajan, B.-P. Muthusamy and T.R. Graham (2011) "Coupling Drs2p to phospholipid translocation, membrane asymmetry and vesicle budding" *In Membrane Asymmetry and Transmembrane Motion of Lipids* (eds P. Devaux and A. Herrmann) John Wiley and Sons

47. Graham, T.R. and C.G. Burd (2011) Coordination of Golgi function by phosphatidylinositol 4-kinases. Trends in Cell Biology 21:113-121

46. Kozlov, M.M. and T.R. Graham (2010) Interplay of proteins and lipids in generating membrane curvature. Curr. Opin. Cell Biol. 4:430-6.

45. Graham, T.R. (2009) Flip-flop season. *In* "Lipid News" section of *ASBMB today*, October issue

44. Natarajan, P., K. Liu, D.V. Patil, C.L. Jackson and T.R. Graham. (2009) Regulation of a Golgi flippase by phosphoinositides and an ArfGEF. Nat Cell Biol. 11: 1421-1426

43. Zhou, X. and T.R. Graham (2009) Reconstitution of phospholipid translocase activity with purified Drs2p, a type IV P-type ATPase from budding yeast. Proc. Natl. Acad. Sci. USA 106:16586-91

42. Muthusamy, B.P., S. Raychaudhuri, P. Natarajan, F. Abe, W.A. Prinz and T.R. Graham. (2009) Control of protein and sterol trafficking by antagonistic activities of a P4-ATPases and oxysterol binding protein homologue. Mol. Biol. Cell. 20: 2920-2931

41. Muthusamy, B.P., P. Natarajan, X. Zhou and T.R. Graham. (2009) Linking phospholipid flippases to vesicle mediated protein transport. Biochem. Biophys. Acta 1791: 612-619

40. Ho CH, Magtanong L, Barker SL, Gresham D, Nishimura S, Natarajan P, Koh JL, Porter J, Gray CA, Andersen RJ, Giaever G, Nislow C, Andrews B, Botstein D, Graham TR, Yoshida M, Boone C. (2009) A molecular barcoded yeast ORF library enables mode-of-action analysis of bioactive compounds. Nat Biotechnol. 27(4):369-77

39. Liu K, K. Surendhran, S.F. Nothwehr, and T.R. Graham. (2008) P4-ATPase Requirement for AP-1/Clathrin Function in Protein Transport from the trans-Golgi Network and Early Endosomes. Mol Biol Cell. 19: 3526 - 3535

38. Fei, W., G. Alfaro, B.-P. Muthusamy, Z. Klaassen, T.R. Graham, H. Yang, C.T. Beh. (2008) Genome-Wide Analysis of Sterol-Lipid Storage and Trafficking in *Saccharomyces cerevisiae*. Euk. Cell. 7: 401 - 414

37. Liu, K., Z. Hua, J. Nepute and T. R. Graham. (2007) The yeast P4-ATPases Drs2p and Dnf1p are essential cargos of the NPFXD/Sla1p endocytic pathway. Mol Biol Cell, 18: 487-500

36. Hua, Z. and T.R. Graham. (2007) "The Golgi Apparatus" In: *Protein Trafficking, Mechanisms and Regulation*. (editor, N. Segev) Landes Bioscience

35. Chen, S., J. Wang, B.-P. Muthusamy, K. Liu, S. Zare, R.J. Andersen and T.R. Graham. (2006) Roles for the Drs2p-Cdc50p complex in protein transport and phosphatidylserine asymmetry of the yeast plasma membrane. Traffic **7**: 1 - 15

34. Natarajan, P. and T. R. Graham. (2006) Measuring translocation of fluorescent lipid derivatives across yeast Golgi membranes. Methods. **39**:163-8

33. Parsons, A.B., A. Lopez, I.E. Givoni, D.E. Williams, C. Gray, J. Porter, G. Chua, R. Sopko, R. Brost, C.-H. Ho, J. Wang, T. Ketela, C. Brenner, J.A. Brill, G.E. Fernandez, T.C. Lorenz, G.S. Payne, S. Ishihara, Y. Ohya, B. Andrews, T.R. Hughes, B.J. Frey, T.R. Graham, R.J. Andersen, and C. Boone. (2006) Exploring the mode-of-action of bioactive compounds by chemical-genetic profiling in yeast. Cell **126**:611-25

32. Xiao, J., L.S. Kim and T.R. Graham. (2006) Dissection of Swa2p/auxilin domain requirements for co-chaperoning Hsp70 clathrin uncoating activity *in vivo*. Mol. Biol. Cell, **17**:3281-90.

31. Graham, T.R. (2004) Flippases and vesicle-mediated protein transport. Trends in Cell Biology **14:** 670 – 677

30. Graham, T. R. (2004) Membrane targeting: Getting Arl to the Golgi. Curr. Biol. **14:** R483 – R485

29. Natarajan, P., J. Wang, Z. Hua, and T.R. Graham. (2004) Drs2p-coupled aminophospholipid translocase activity in yeast Golgi membranes and relationship to in vivo function. Proc. Natl. Acad. Sci., USA **101**: 10614-10619

28. Chantalat, S., S.-K. Park, Z. Hua, K. Liu[+], R. Gobin, A. Peyroche, A. Rambourg, T. R. Graham[,] and C. L. Jackson. (2004) The Arf Activator Gea2p and the P-type ATPase Drs2p Interact at the Golgi in *Saccharomyces cerevisiae*. J. Cell Sci. **117**: 711-722

27. Chim, N., W.E. Gall, J. Xiao, M.P. Harris, T. R. Graham and Andrzej M. Krezel. (2004) Solution structure of the ubiquitin-binding domain in Swa2p from *Saccharomyces cerevisiae*. Proteins: Structure, Function, and Bioinformatics. **54**: 784-793

26. Hua, Z., and T.R. Graham. (2003) Requirement for Neo1p in retrograde transport from the Golgi complex to the endoplasmic reticulum. Mol. Biol. Cell **14**: 4971 – 4983

25. Hua, Z., P. Fatheddin and T.R. Graham. (2002) An essential subfamily of Drs2p-related P-type ATPases is required for protein trafficking between the Golgi complex and endosomal/vacuolar system. Mol. Biol. Cell **13**: 3162-3177

24. Gall, W.E., N.C. Geething, Z. Hua, M.F. Ingram, K. Liu, S. Chen, and T.R. Graham. 2002. Drs2p-dependent formation of exocytic clathrin-coated vesicles *in vivo*. Current Biology **12**: 1623-1627

23. Graham, T.R. and S.F. Nothwehr. 2002. "Protein transport to the yeast vacuole" In: *Protein Targeting, Transport and Translocation*. (ed G. von Heijne and R. Dalbey) Academic Press, London.

22. Gall, W.E., M.A. Higginbotham, C.-Y. Chen, M.F. Ingram, D.M. Cyr and T.R. Graham. 2000. The auxilin-like phosphoprotein Swa2p is required for clathrin function in yeast. Current Biology **10**: 1349-1358

21. Graham, T. R. 2000. "Metabolic labeling and immunoprecipitation of yeast proteins." In: *Current Protocols in Cell Biology*, Volume 1 (eds. J.S. Bonifacino, M. Dasso, J.B. Harford, J. Lippincott-Schwartz, K.M. Yamada) John Wiley and Sons, New York, NY

20. Brigance, W.T., C. Barlowe and T.R Graham. 2000. Organization of the yeast Golgi complex into at least four functionally distinct compartments. Mol. Biol. Cell **11**: 171-182

19. Hopkins, B. D., K. Sato, A. Nakano and T. Graham. 2000. Introduction of Kex2p cleavage sites in fusion proteins for monitoring localization and transport in the yeast secretory pathway. Meth. in Enzymol. **327**: 107-118

18. Chen, C.-Y., M.F. Ingram, P. Rosal, and T.R. Graham. 1999. Role for Drs2p, a P-type ATPase and potential aminophospholipid translocase, in yeast late Golgi function. J. Cell Biol. **147**: 1223-1236.

17. [§]Gaynor, E. C., [§]C.-Y. Chen, S. D.Emr, and T. R. Graham. 1998. ARF is required for maintenance of yeast Golgi and endosome structure and function. Mol. Biol. Cell **9**: 653 - 670, § equal contribution

16. Gaynor, E.C., T.R. Graham and S.D. Emr. 1998. COPI in ER/Golgi transport and intra-Golgi transport: do yeast COPs point the way? Bioch. Biophys. Acta **1404**: 33 - 51

15. Chen, C.-Y., and T. R. Graham. 1998. An *arf1Δ* synthetic lethal screen identifies a new clathrin heavy chain conditional allele that perturbs vacuolar protein transport. Genetics **150**: 577 - 589.

14. Reynolds, T.B., B.D. Hopkins, M.R. Lyons and T.R. Graham. 1998. The high osmolarity glycerol response (HOG) MAP kinase pathway controls localization of a yeast Golgi glycosyltransferase. J. Cell Biol. **143**: 935-946.

13. Krasnov, V. and T. R. Graham. 1995. The Golgi complex of *Saccharomyces cerevisiae*. Can. J. Botany **73**: S343-S346

12. Graham, T. R., and V. A. Krasnov. 1995. Sorting of yeast α1,3 mannosyltransferase is mediated by a lumenal domain interaction, and a transmembrane domain signal that can confer clathrin-dependent Golgi localization to a secreted protein. Mol. Biol. Cell **6**: 809-824

11. Graham, T. R. and S. D. Emr. 1994. *SEC18*. In: Guidebook to the Secretory Pathway (J. Rothblatt, P. Novick, and T. Stevens, eds.) Oxford University Press, New York, pp. 132-133

10. Gaynor, E. C., S. te Heesen, T. R. Graham, M. Aebi, and S. D. Emr. 1994. Signal-mediated retrieval of a membrane protein from the Golgi to the ER in yeast. J. Cell Biol. **127**: 653-665

9. Graham, T. R., M. Seeger, V. MacKay, G. S. Payne, and S. D. Emr. 1994. Clathrin-dependent localization of α1,3 mannosyltransferase to the Golgi complex of *Saccharomyces cerevisiae*. J. Cell Biol. **127**: 667-678

8. Graham, T. R., P. Scott, and S. D. Emr. 1993. Brefeldin A reversibly blocks early but not late protein transport steps in the yeast secretory pathway. EMBO J. **12**: 869-877

7. Lacoste, H. C., T. R. Graham, and A. Kaplan. 1992. A sequence in β-hexosaminidase from *Dictyostelium discoideum* required for sorting of proteins to a compartment involved in developmentally induced secretion. J. Biol. Chem. **267**: 5942-5948

6. Robinson, J. S., T. R. Graham, and S. D. Emr. 1991. A putative zinc finger protein, *Saccharomyces cerevisiae* Vps18p, affects late Golgi functions required for vacuolar protein sorting and efficient α-factor prohormone maturation. Mol. Cell. Biol. **12**: 5813-5824

5. Graham, T. R. and S. D. Emr. 1991. Compartmental organization of Golgi-specific protein modification and vacuolar protein sorting events defined in a yeast *sec18* (NSF) mutant. J. Cell Biol. **114:** 207-218

4. Vida, T. A., P. K. Herman, S. D. Emr, and T. R. Graham. 1991. Compartmentalized transport, modification and sorting of yeast vacuolar hydrolases. Biomed. Biochim. Acta, **50:** 413-420.

3. Vida, T. A., T. R. Graham, and S. D. Emr. 1990. *In vitro* reconstitution of intercompartmental protein transport to the yeast vacuole. J. Cell Biol. **112:** 2871-2884.

2. Graham, T.R., H. P. Zassenhaus, and A. Kaplan. 1988. Molecular cloning of the cDNA which encodes β-N-acetylhexosaminidase A from *Dictyostelium discoideum*. J. Biol. Chem. **263:** 16823-16829.

1. Cladaras, M. H., T. R. Graham, and A. Kaplan. 1984. Interaction of *Dictyostelium discoideum* α-mannosidase with beef liver phosphomannosyl receptor. Biochem. Biophys. Res. Comm. **116:** 541-546

ABSTRACTS ('09 - present):
* Selected by meeting organizers for oral presentation.
§ Invited speaker
Presenter
Graham, T.R. (2014) Roles for Phospholipid Flippases in Membrane Asymmetry and Vesicular Transport
15th annual Internation Union of Biochemistry and Molecular Biology meeting, Taipae, Taiwan

Graham, T.R. (2014) Insight into the Phospholipid Flippase Giant Substrate Problem
Japanese Biochemical Society Meeting, Kyoto, Japan

Graham, T.R. § (2014) Probing how and why P4-ATPases flip phospholipid across membranes. Keynote Lecture at the Na^+, K^+-ATPase and Related Transport ATPases Structure, Mechanism, Cell Biology, Health and Disease.

Graham, T.R. § (2014) Building Asymmetric Membranes with P4-ATPases. ASBMB Annual Meeting, San Diego, CA (4/27 – 4/30/14)

Graham, T.R. § (2014) The jagged trail from Sec'zy science to flippin' lipids. Symposium on Cell Signaling and Membrane Traffic. UCSD, La Jolla, CA (4/26/14)

Graham, T.R. § (2014) Probing the inner workings of phospholipid pumps. Gordon Research Conference on Protons and Membrane Reactions. Ventura, CA (2/23 – 2/28/14)

Graham, T.R. § (2013) Phospholipid flippases: significance others for Arf GEFs and GAPs. FASEB meeting on Arf and Rab G Proteins. Snowmass Village, CO (07/28 – 8/2)

Graham, T.R. § (2013) The flip side of membrane biogenesis: creating asymmetry with P4-ATPases. Cell and Molecular Biology of Lipids Gordon Conference. Waterville Valley, NH (07/21 - 26)

Hankins, H., L. Theorin, T. Sebastian, T. Pomorski and T.R. Graham (2013) Role of Drs2 in generation of membrane curvature. Poster presentation at the Southeast Regional Yeast Meeting, Birmingham, AL. March 8 – 10.

Takar, M., R.D. Baldridge and T.R. Graham (2013) Probing substrate interaction with type IV P-type ATPases. Poster presentation at the Southeast Regional Yeast Meeting, Birmingham, AL. March 8 – 10.

Xu, P. and T.R. Graham (2013) Recruitment of a membrane curvature sensor to endosomes requires phosphatidylserine translocation by Drs2. Platform presentation at the Southeast Regional Yeast Meeting, Birmingham, AL. March 8 – 10.

Baldridge, R. and T.R. Graham§ (2012) Probing the phospholipid flippase giant substrate problem. Invited speaker at the European Federation for the Science and Technology of Lipid meeting in Bern, Switzerland. May 16-19

Baldridge, R. and T.R. Graham (2012) Probing the Mechanism of Phospholipid Flip by type IV P-type ATPases. Invited speaker. FASEB meeting on New Frontiers in Transport ATPases: From Mechanistic to Theurapeutic Concepts. Snowmass Village, CO June 3 – 8.

Baldridge, R. and T.R. Graham§ (2012) Investigating the mechanism of phospholipid flip by P4-ATPases. Invited Speaker, but convinced organizers to allow Baldridge to give the talk. FASEB meeting on Phospholipid Metabolism: Disease, Signal Transduction and Membrane Dynamics. Saxtons River VT. July 15 – 20

Xu, P. and T.R. Graham (2012) A phospholipid flippase is required for ALPS motif-dependent recruitment of an ArfGAP to endosomal membranes. Keystone Conference on Membranes in Motion. Tahoe City, CA. Jan 22 - 27

§Graham, T.R. (2011) Probing the mechanism of substrate recognition by phospholipid flippases in the type IV P-type ATPase Family. ASBMB conference on Na+/K+ ATPases and Related ATPases, Pacific Grove, CA (09/27 – 10/2)

Baldridge, R. and T.R. Graham § (2011) Towards a solution to the phospholipid flippase giant substrate problem. Cell and Molecular Biology of Lipids Gordon Conference, Waterville Valley, NH (07/17 - 22)

Sebastian, T., Z. Zhou, J.C. Randolph and T.R. Graham (2010) Auto-inhibition of a yeast phospholipid flippase by its carboxyl-terminal tail. Arf Family G Protein FASEB conference, Carefree, AZ (08/15-20)

§Graham, T.R. (2010) Phospholipid flippases and Arf-dependent vesicle budding from the *trans*-Golgi network. Arf Family G Protein FASEB conference, Carefree, AZ (08/15-20)

Baldridge, R. and T.R. Graham (2010) Exploring the mechanism of phospholipid recognition by P4-ATPases. Transport ATPases: From Molecules to Maladies, FASEB conference, Snowmass CO (06/06 - 11)

§Graham, T.R. (2010) Linking P4-ATPase phospholipid flippases to vesicle-mediated protein transport. Transport ATPases: From Molecules to Maladies, FASEB conference, Snowmass CO (06/06-11)

Zhou, X., and T.R. Graham (2009) Purification and reconstitution of Drs2, a type IV P-type ATPase and poential flippase. ASBMB annual meeting, New Orleans, LA

Baldridge, R. and T.R. Graham. (2009) Exploring the Mechanism of Phospholipid Recognition by P4-ATPases. ASCB annual meeting, San Diego, CA

Natarajan, P., K. Liu, D.V. Patil, V.A. Sciorra and T.R. Graham. (2009) Regulation of a Golgi flippase by phosphoinositides and an ArfGEF. Southeast Regional Yeast Meeting, Nashville, TN

Sebastian, T. and T.R. Graham (2009) Role of Apl4 and Rcy1 in the recycling pathway of Drs2p to the trans-Golgi network. Southeast Regional Yeast Meeting, Nashville, TN

J. Wen, B.-P. Muthusamy and T.R. Graham (2009) Kes1 suppression of Neo1-ts. Southeast Regional Yeast Meeting, Nashville, TN.

Surendhran, K. and T.R. Graham (2009) Role for Drs2, a potential phospholipid translocase, in membrane curvature and vesicle formation. Southeast Regional Yeast Meeting, Nashville, TN

Zhou, X. and T.R. Graham (2009) Purification and reconstitution of Drs2, a type IV P-type ATPase and poential flippase. Southeast Regional Yeast Meeting, Nashville, TN

INVITED LECTURES AND SEMINARS

Invited Speaker, 15th Annual Meeting of the International Union of Biochemistry and Molecular Biology, Taipei, Taiwan (10/21 – 10/26/14)

Invited Speaker, 87th Annual Meeting of the Japanese Biochemical Society. Kyoto, Japan (Oct 16 – 19)

Department of Health Chemistry, Grad. Sch. Of Pharmaceutical Sciences, University of Tokyo, Japan.

Invited Speaker and Keynote Lecturer, "Na^+/K^+ ATPase and Related Transport ATPases", Lunteren, The Netherlands, 8/30 – 9/5/14

Invited Speaker, GRC on "Membrane Transport Proteins", Mount Snow, VT (7/13-7/18/14)

Invited Speaker and Session Chair, "Emerging Topics in Membrane Asymmetry" at the ASBMB Annual Meeting, San Diego, CA (4/26 – 4/30/14),

Co-organizer and speaker, Symposium on "Cell Signaling and Membrane Traffic", La Jolla, CA (4/26/14)

Co-organizer, 21st Annual Southeast Regional Yeast Meeting, Nashville, TN (3/14 – 3/16/14)

Invited Speaker, GRC on "Protons and Membrane Reactions", Ventura, CA (2/23/14)

Molecular Pharmacology Program, University of Pittsburgh School of Medicine, Pittsburgh, PA (12/3/13)

Biological Chemistry, University of Michigan Medical Center, Ann Arbor MI (10/22/13)

Invited Speaker, FASEB conference on "Arf and Rab Family G Proteins", Snowmass Village, CO (7/28/13)

Invited Speaker, GRC on "Molecular and Cellular Biology of Lipids", Waterville Valley, NH (7/21/13)

Biochemistry, University of Alberta, Edmonton, Canada (6/25/13)

Biochemistry and Molecular Biology, University of British Columbia, Vancouver, Canada (4/22/2013)

Molecular and Cell Biology, Boston University School of Dental Medicine (11/29/2012)

Biological Sciences, MARC Program at Tennessee State University (11/16/2012)

School of Sciences Colloquium Speaker, Belmont University, Nashville, TN (10/23/2012)

Invited Speaker, FASEB conference on "Phospholipid Metabolism: Disease, Signal Transduction & Membrane Dynamics", Saxtons River, VT (7/2012)

Invited Speaker, FASEB conference on New Frontiers in Transport ATPases: From Mechanistic to Therapeutic Concepts", Snowmass, CO (6/2012)

Invited Speaker, 2nd Ann. European Symp. on Microbial Lipids, Bern, Switzerland, (5/2012)

Invited Speaker, Southeast Regional Yeast Meeting, Atlanta, GA (02/2012)

Biological Sciences, MARC Program at Tennessee State University (12/2/2011)

Invited speaker, ASBMB symposium on Na^+/K^+ ATPase and related P-type ATPases: Structure, Biology and Medicine. Pacific Grove, CA (9/27 – 10/2/2011)
Plant Biology and Biotechnology, University of Copenhagen, DK (8/12/2011)
Molecular Genetics, Ohio State University (3/31/11)
Invited Keynote Speaker, Swiss Yeast Meeting, Fribourg, Switzerland (09/2010)
Invited speaker, Arf Family G-proteins, FASEB meeting, Carefree, AZ (08/2010)
Invited speaker, Transport ATPases: From Molecules to Maladies, FASEB meeting, Snowmass CO (06/2010)
Co-chair of minisymposium on "Advances in Protein Molecular and Cell Biology. PepCon 2010, Beijing China (3/21/10)
Institute for Environmental Medicine, Univ of Pennsylvania (4/3/09)
Co-organizer, Southeast Regional Yeast Meeting (3/27 – 3/29, 2009)
Cell Biology, University of North Carolina (2/18/09)
Invited speaker, "Flippase 2008", Nov 2 – 7, Ascona, Switzerland
Co-organizer of ASBMB conference on "Cellular Lipid Transport – Connecting Fundamental Membrane Assembly Processes to Human Disease". Oct 22 – 26, 2008, Canmore, Alberta Canada. Dennis Voelker, Todd Graham and Jean Vance, organizers.
Biochemistry, Weill Cornell Medical College (3/13/08)
Biochemistry and Molecular Biology, Johns Hopkins University School of Public Health (4/2/07)
Cell Biology, University of Alabama at Birmingham (4/16/08)
Co-chair of minisymposium on Membrane Transporters and Exchangers at the 51st Annual Meeting of the Biophysical Society, Baltimore, MD (3/3 – 3/7, 2007)
Co-chair of minisymposium on *Endo- and Exocytosis* at the 46th Annual Meeting of the ASCB, San Diego, CA (12/9 – 12/13, 2006)
Bichemistry, Cell and Molecular Biology, Univ of Tennessee, Knoxville (10/4/2006)
Biological Sciences, MARC Program at Tennessee State University (10/7/06)
Molecular Biosciences, University of Kansas (11/14/05)
Biochemistry, Dartmouth Medical School (4/8/05)
Physiology and Biophysics, University of Iowa (2/22/05)
Biological Sciences, MARC Program at Tennessee State University (11/12/04)
Chemistry, Indiana University (9/13/04)
Cell Biology and Metabolism Branch, NICHD, NIH (4/2/04)
Biological Sciences, Western Kentucky University (3/5/04)
Biological Sciences, MARC Program at Tennessee State University (4/03)
Biology, Tougaloo College MARC program, (9/03)
Physiology, Emory University (4/03)
Physiology, Tufts University (10/02)
Biological Sciences, MARC Program at Tennessee State University (11/01)
Cell Biology, University of Alabama at Birmingham (1/00)
Dev. and Mol. Biol., Albert Einstein College of Med. (10/99)
Biochemistry, University of Kentucky (8/99)
Molecular Genetics, Ohio State University (2/99)
Microbiology and Immunology, Vanderbilt University (10/98)
Biochemistry, St. Louis University School of Medicine (12/96)
Biological Sciences, University of Illinois at Chicago (11/96)
Microbiology and Immunology, Vanderbilt University (1/93)
Pharmacology, Vanderbilt University (2/93)
Molecular Biology, summer masters program lecture series (6/93)

Biology, Vanderbilt University (10/93)

ACTIVE GRANTS

PI, National Institutes of Health, 2 RO1 GM62367-09, 6/1/10 – 5/31/14, $208,166 direct costs per year. $1,277,258 total award. "Drs2p function in clathrin-coated vesicle budding" (1 yr no cost extension to 5/31/15)

PI, National Institutes of Health, 1 R01 GM107978-01, 7/01/13 – 6/30/17, $190,000 direct costs per year, 100,224 indirect costs in first year, $1,184,851 total award. "P4-ATPase mechanism of phospholipid translocation"

PI, National Science Foundation, MCB-1414457, 2/15/14 – 1/31/15, $4000 direct costs
Conference: Southeast Regional Yeast Meeting, March 14 – 16, 2014 at Vanderbilt University

PREVIOUS GRANTS

PIs Graham and Kenworthy, Vanderbilt Discovery Grant, 5/1/10 – 4/30/13, $95,000 total award
"Influence of phospholipid asymmetry on cholesterol dynamics in membranes"

Co-PI, (PI, E. Knapik) National Institutes of Health, 1R01DE018477-01, 8/1/07 – 7/31/11, $250,000 direct costs "Role of the Secretory Pathway in Craniofacial Morphogenesis"

PI, National Institutes of Health, 2 RO1 GM62367-08, 9/1/05 – 8/31/10, $185,000 direct costs per year. $1,121,529 total award. "Drs2p function in clathrin-coated vesicle budding"

PI, National Institutes of Health, 3 RO1 GM62367-05S1, 7/1/06 – 8/31/08, $71,646 total project direct costs. $103,813 total award. Research Supplement to Promote Diversity in Health-Related Research for"Drs2p function in clathrin-coated vesicle budding"

PI, National Science Foundation, MCB0543274, 7/1/06 – 6/31/07, $49,047 direct costs, $75,000 total. "Yeast Auxilin Regulation of Clathrin Dynamics". No cost extension through 6/31/08.

co-PI, Vanderbilt University Discovery Grant, 5/1/04 – 6/30/06, $50,000
"Conservation of type IV P-type ATPase function in protein trafficking".

PI, National Institutes of Health, 1 RO1 GM62367-01A1, 9/1/01 – 8/31/05, Total budget, $956,386. "Drs2p function in clathrin-coated vesicle budding"

PI, National Institutes of Health, 2 RO1 GM50409-05A1 1/99-12/02 Total budget, $847,305
"Compartmental organization of the yeast Golgi complex".

PI, National Science Foundation CAREER award, MCB-9600835, 9/96 - 8/00, $300,000
"Isolation and characterization of yeast genes that genetically interact with *arf1*"

Co-PI, NSF Multi-User Biological Equipment and Instrumentation Resources. BIR-9419667
1/1/95-12/30/95 $195,837 "Quantitative Biology Core".

PI, National Institutes of Health, RO1 GM50409 1/94-12/98 Total budget, $603,630

"Compartmental organization of the yeast Golgi complex".

PI, University Research Council, Vanderbilt University 1993 $8,590
"Cloning and characterization of genes that encode components of the yeast secretory pathway"

TEACHING

CURRENT

Introduction to Biological Sciences, BSCI110A, fall '08 – present (~200 students annually)
Introduction to Cell Biology, BSCI201, Spring '99 – present (~80 students annually)
Bioregulation I, IGP 300A, Membrane Biology Lecturer, Fall '94 – present; (~60 students)
Chair of Cell Biology section, Fall '99 – present,
Yeast Genetics Lecturer, F '95 – F '03, F'07

PREVIOUS

Molecular Membrane Biology, BSCI268, Fall '06
Cell Biology Laboratory, BSCI202, Spring '99 – '06
Cellular Microbiology of the Pathogen-Host interaction, M&IM350, S '01, '02, '03
Microbial Genetics, MB328, Fall '96 -'01
Principles of Genetics, MB210, F '93 - S '97
Independent Reading in Molecular Biology, MB282
S '93, R. Ohi; S '94, K. Nagy and J. Kemp; F '94 S. Young; F '98 Ben Johnston; S '01 Mark Harris
Focal Topics in Molecular Biology, MB344, S '96, S '97
Special Topics and Advanced Techniques (BSCI390), Fall Spring and Summer '00-'05
Undergraduate Seminar in Molecular Biology, MB275a S '94
Graduate Seminar in Molecular Biology, MB320 F '94, F '95
Advanced Reading in Molecular Biology, MB385, S '93
Advanced Techniques in Molecular Biology (DNA Cloning and Sequencing Section), MB390
Summer '94

UNDERGRADUATE RESEARCH ADVISEES

Internship in laboratory research, BSCI 280
S '08, Kasey Leach; S'10, Emily Merkel; S'12 Christina Snider
Directed Laboratory Research in Molecular Biology, BSCI283
S '93, D. Brower; Summer, '95 V. Snyder; S '97 M. Lyons; F 97 M Higginbotham; F '98 Andy Cook, S '99 M. Williams, F '99 B. Sommerville, F '00 Roxanna Eftkahari, Parvin Fatthedin, S '01 Seema Izfar, F'01 Mark Harris, F'02 Joshua Nepute, S'03 Aisha Jennings, Nick Atria; F '03 Rohini Khatri, Kendall Walters; F '04 Richard Green, Nia Soetandyo, F '05 Leslie Kim; F '06 David Shisler, S '07 Sam Moak, Dustin Patil; S '08 Briana Weiser; F '08 Kasey Leach, S '09 Jason Wen; S '10 Keith Porter; F '10 Emily Merkel, Katherine Roth; F '11 Kathryn Ivy; S'13 Christina Snider, F '13 Deanna Tiek
Independent Laboratory Research in Molecular Biology, BSCI286
F' 93, D. Brower; F' 94, A. Legge and J. Stafford; S '95, S. Young and A. Legge; F '99 M. Williams, S '01 Parvin Fatheddin, S'02 Mark Harris, S '03 Sara Zare; F and S'04 Nick Atria, S '05 Richard Green and Nia Soetandyo; S '06 David Shisler; F '07 Sam Moak, Dustin Patil; F '08 Briana Weiser, S '09 Brianna Weiser, Kasey Leach, F '10 Keith Porter; F '11 Katherine Roth; F'13 Deanna Tiek
VUSRP and HHMI summer fellowship students
'93, M. Simmons and D. Brower; '94 J. Stafford; '95 K. Thompson; '96 P. Rosal, '97 M. Lyons and M. Higginbotham, '98 M. Higginbotham and D. Khalatbari, '99 K. Hollister and B.

Sommerville; ‘04 Richard Green (Minority fellowship). Erika Takle (Germs and defense summer fellowship), ’11 Kathryn Ivy, ’13 Christina Snider

Honors Research, BSCI296; '95 - '96 A. Mullen; '96 - '97 Peter Rosal (’97 Excellence in Molecular Biology Research Award); '97 - '98 Matthew Lyons; '98 - '99 Megan Higginbotham (’99 Excellence in Molecular Biology Research Award); ‘00-’01 Nathan Geething (’01 Excellence in Molecular Biology Research Award); ‘01-’02 Parvin Fatthedin, Seema Izfar; 02-03 Mark Harris; ’03-’04 Joshua Nepute (’04 Excellence in Biological Sciences Research Award); ’04-05 Rohini Khatri; ‘05-06 Richard Green and Nia Soetandyo; ‘06 – 07 Leslie Kim; 07-08 David Shisler; '10-'11, Kasey Leach, Jason Wen, '11-'12 Emily Merkel; ’12-’13 Kathryn Ivy, ’13-’14 Christina Snider

High School Students: Indira Bhasvra, J. Court Reese, Leah Kaplan, John Arnold

FORMER GRADUATE STUDENT ADVISEES

Todd Reynolds (5/94-5/99, Ph.D.) Postdoctoral fellow at MIT with Gerald Fink. Associate Professor, Department of Microbiology, University of Tennessee

Chih-Ying Chen (5/94-5/99, Ph.D.) Postdoctoral fellow at UCSF with Frances Brodsky,

W. Todd Brigance (5/95-9/00, Ph.D.) Postdoctoral fellow at Johns Hopkins Univ. with Mark Soloski, (Deceased)

B. Diane Hopkins (5/96-8/01, Ph.D.) Assistant Professor at Palm Beach Atlantic College

Walter Gall (5/99-5/02, Ph.D.) 2001 Excellence in Molecular Biology Research Award, Postdoctoral Fellow at UNC with Ted Salmon, Strategy consultant, Biotechnology enterprises

Zhaolin Hua (5/99-5/03, Ph.D.) 2002 Excellence in Molecular Biology Research Award, Postdoctoral fellow at UC San Francisco with Robert Edwards

Jing Xiao (4/02-3/07, Ph.D.), Self employed

Ke Liu (4/02-4/07, Ph.D.), Postdoctoral Visiting Fellow, Institute: NIH Chemical Genomics Center, National Human Genome Research Institute with Wei Zheng

A’Drian Pineda (4/05 – 9/08; MS). Research Associate III/MB at the J. Craig Venter Institute.

Weizhen “Maggie” Ying (4/07 – 9/08; MS)

Kavitha Surendhran (4/06-5/09; M.S.)

Baby-Periyanayaki Muthusumy (4/05 - 8/09), Postdoctoral Fellow with Rik Derynck
Professor and Vice Chair, Department of Cell and Tissue Biology
University of California at San Francisco

Xiaoming Zhou (4/05 - 4/10), Postdoctoral Fellow with Ming Zhou, Department of Molecular Physiology and Biophysics, Columbia University

Ryan Baldridge (4/08 – 3/13), Postdoctoral Fellow with Tom Rapoport, Dept of Cell Biology and HHMI, Harvard Medical School

Tessy Sebastian (4/08 – 1/16/2014),

CURRENT POSTDOCTORAL ADVISEES

Peng Xu (9/01/2010 - present), Yuantai Wu (9/01/2013 – present),

Bartholomew Roland (04/01/2014 – present)

CURRENT GRADUATE STUDENT ADVISEES

Hannah Hankins (5/12 - present), Mehmet Takar (8/12 - present)

FORMER POSTDOCTORAL ADVISEES

Michael F. Ingram (7/97-6/00), Todd Reynolds (6/99 – 11/99), Walter Gall (5/02-8/02), Jiyi Wang (5/02 – 5/19/2005), Paramasivam Natarajan (8/02 – 3/31/09), Zhaolin Hua (5/03 – 9/03)

THESIS COMMITTEES (Current, **Chair**)

Biological Sciences: Michael Zinda, DeAnne Olsen, Ismael Perez, Sara Perlaky, **Utz Herbig**, Johnathan Ewald, Raymond Sealy, Amy Altman, Yuqi Qiao, **Andrea Patton**, Robert Ott, Nicholas Chim, Jun Li, **Florence Marlow**, Elaine Merrill, Robin Ryther, Jinmin Gu, Vitaly Klimovitch, **Jennifer Ray Panizzi**, Kanika Benton, **Ian Hawkins**, Hong Ji, **Jennifer Osterhage**, Payal Ray, **Chunyue Yin, Jennelle Talley, Elizabeth Thatcher, Robin Brooks, Ashleigh Long**, Nan Li, Morgan Sammons, **Jenifer Ferguson, Diane Kanter, Vanessa Hobbs, Isi Tolliver, Charlene Hawkins, Neil Dani, Noelle Holmes, Udo obodo, Nicole Diggins, Mary Lynn Dear,** Will Parkinson, **Nalini Dhingra**, **Diana Cha**

Micro and Immuno: Chris Mullins, Qing Xu, Michelle Becker, Clint VanValkenburgh, Daniel Ebert, Sean Brock, Haobo Liang, Aaron Derdowski, David Dismuke, Tom Utley, Chris Rold, Fyza Shaikh, Noelle Holmes, Paula Zamora

Cell and Developmental Biology: Greg Den Haese, Ryomi Ohi, Robert Carnahan, Joe Tasto, Hyunjoo Yoon, Clinton Bartholemew, Joshua Rosenberg, Mi Miao, Abel Alcazar-Roman, Laura Terry, Rachel Roberts, Jonathan Gephart, Paul Miller, Matthew Broadus, Laura Titus, Daniel Levic, Twila Mason, Tyler McCann, Christine Jones, Amanda Lloyd, Zachary Elmore, Amanda Casey

Cancer Biology: Permilla Herrell

Pharmacology: Nicole Schramm, Andrea Bauman, Hilary Highfield, Scott Gruver

Neuroscience: Shawn Ferguson, Will Walker, Caleb Doll, Katharine Gurba

Biology, Jiqing Sai

Mol. Phys. & Biophys.: Yu Bai, Jinhui Dong

Pathology: Monica Farkas

Univ. of Alabama at Birmingham, Dept of Cell Biology: Lora Topalof

Dartmouth University, Dept of Biochemistry: Matthew Heidtman

University of Copenhagen, Dept of Plant Biology and Biotechnology: Susanne Hanisch (reader)

University of British Columbia, Dept of Biochemistry and Molecular Biology: Jonathan Coleman (external reader)

University of Alberta, Dept of Biochemistry: Przemyslaw Andrzej Gorski (external reader)

SERVICE TO THE UNIVERSITY

Institutional Committee for Limited Submission Opportunities in the Biomedical Sciences, '13

Faculty search committee in Biological Sciences: Developmental Biology, '13-'14

Phi Beta Kappa, Treasurer '12 – present

Faculty search committee in Biological Sciences: Biochemistry, '12-'13

Biological Sciences undergraduate curriculum committee, '11-'12.

Search committee for the Chair of the Department of Cell and Dev. Biol. (VUMC, '10 - '11)

Curriculum Committee for the Interdisciplinary Graduate Program ('10-'11)

Internal Review Committee for the Interdisciplinary Graduate Program. Chair of the Curriculum review group

Faculty Senate representative (2009 – 2010)

Biological Sciences Faculty Search committee (2009, 2012)

AXLE curriculum implementation committee, '04- present

Advisory Committee on the Health Related Professions. F '94 – '09

Chair of the IGP Internal Review curriculum subcommittee (2009)

Director of Graduate Studies, Department of Biological Sciences 2/00 – 8/05

University chemical Safety Committee, F '00 – '05

Senior Advisory Review Committee, ’07-‘08
Biological Sciences major advisor. Fall '94 - present
Chair; Cell Biology faculty search committee (04-05)
Co-organizer of weekly seminar series in the Department of Molecular Biology. F '93 - S '95
Pre-Major Advisor. F'94 – ‘00
Summer Academic Orientation Advisor. Summer '98
Chair; Molecular Genetic faculty search committee. F ’99 – S ’00
Organizer of the 2001 Biological Sciences Departmental retreat

SERVICE TO THE PROFESSION

Meeting organization

ASBMB conference on “Cellular Lipid Transport – Connecting Fundamental Membrane Assembly Processes to Human Disease”. Oct 22 – 26, 2008, Canmore, Alberta Canada. Dennis Voelker, Todd Graham and Jean Vance, organizers.

XVIth annual Southeast Regional Yeast Meeting, March 27-29, 2009. Vanderbilt University, Nashville, TN. Organizers: Todd Graham and Katherine Friedman

Editorial Boards:

Cellular Logistics, Frontiers in Cell and Developmental Biology – Membrane Traffic

Peer Reviewer:

National Institutes of Health, MBPP study section regular member (2009 – 2014)
Site visit and review of the Cell Biology and Metabolism Branch (NICHHD) (11/28 – 11/30, 2006
Granting agencies: American Cancer Society (Ad hoc),
National Science Foundation Cellular Organization Advisory Panel Member for the Cell Biology Program (11/1/97 - 10/31/98, 4/02, 5/06)
National Institutes of Health, CDF-4 ad hoc (6/03), Special Emphasis Panel/NRSA ZRG1 F05 (3/06), MBPP ad hoc (6/07, 2/10 and 6/10), CSF ad hoc (10/07), MBPP ad hoc (2/10)
Journals: Journal of Biological Chemistry, Journal of Cell Biology, Genetics, EMBO J, Journal of Cell Science, Molecular Biology of the Cell, Current Biology, Traffic, Eukaryotic Cell, Cell and Molecular Biology, Yeast, Nature reviews, Biochemistry.

Professional Societies:

American Society for Cell Biology (ASCB)
Genetics Society of America (GSA)
American Society for Biochemistry and Molecular Biology (ASBMB)