VINCENT JOSEPH STARAI, PH.D.

Associate Professor, The University of Georgia
Departments of Microbiology and Infectious Diseases
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Education

2004-2009		Damon Runyon Postdoctoral Fellow, Dartmouth Medical School
1998-2004	Ph.D.	University of Wisconsin-Madison (Microbiology)
1994-1998	B.S.	University of Illinois at Urbana-Champaign (Microbiology)

Honors and Awards

2015-2019	UGA Career Center Acknowledgement (University of Georgia)
2012	Provost's Summer Research Award (University of Georgia)
2008	E. Lucile Smith Award for Excellence in Biochemistry: Given annually to the graduate student and the postdoctoral fellow who have best demonstrated scientific excellence in Biochemistry. (Dartmouth Medical School)
2007-2009	NIH Autoimmunity and Connective Tissue Training Grant Award (Dartmouth Medical School)
2004-2007	Damon Runyon Cancer Research Foundation Fellow
2003	Department of Bacteriology Chair's Award: Recognizes a graduate student displaying outstanding achievements in their graduate career, and exhibits great potential for success in a post-graduate academic career. (University of Wisconsin-Madison)
2003	Gamma Sigma Delta Agricultural Honor Society Member (University of Wisconsin-Madison)
2002-2004	Pfizer Predoctoral Fellow
2001	Jerome J. Stefaniak Predoctoral Fellowship (University of Wisconsin-Madison)

Research Experience and Positions

Associate Professor (with tenure), 2015-Present
University of Georgia, Departments of Microbiology and Infectious Diseases

Adjunct Associate Professor, 2015-Present
Clemson University, Department of Biological Sciences

Director, REU Site Award, 2014-Present
University of Georgia, Department of Microbiology

Assistant Professor, 2009-2015
University of Georgia, Departments of Microbiology and Infectious Diseases

Postdoctoral Fellow, 2004-2009
Dartmouth Medical School, Department of Biochemistry
Advisor: William T. Wickner, MD

Research Assistant, 1998-2004 (Ph.D. thesis)
University of Wisconsin-Madison, Department of Bacteriology
Advisor: Jorge C. Escalante-Semerena, Ph.D.

Professional Services

2010 *Ad hoc* reviewer, *Proceedings of the National Academy of Sciences*
2011- Review Editor, *Frontiers in Cellular and Infection Microbiology*
2013 *Ad hoc* reviewer, *Acta Crystallographica* Section D
2015 *Ad hoc* reviewer, *PLoS Pathogens*
2016 *Ad hoc* reviewer, *PLoS One*
2019 Temporary Member, National Institutes of Health study section *ZRG1*
2019 *Ad hoc* reviewer, *Fungal Genetics and Biology*
2020 Temporary Member, National Institutes of Health study section *ZRG1*

Invited Speaker

2011 University of Texas-Southwestern Medical Center, Department of Molecular Biology
2011 University of Georgia, Department of Cell Biology
2012 Georgia Health Sciences University, Department of Cellular Biology and Anatomy
2013 99th Annual Southeastern Branch American Society for Microbiology Meeting, Auburn University
2014 University of Southern Mississippi, Department of Biology
2014 University of Wisconsin-Madison, Department of Bacteriology
2015 University of Alabama-Birmingham, Department of Biochemistry and Molecular Genetics
2016 University of Wyoming, Department of Molecular Biology
2019 University of Georgia, Department of Infectious Diseases
2020 University of Georgia, Department of Cellular Biology (cancelled due to COVID-19)

Academic Services

2018-2019 Member, Chair Search Committee, Department of Microbiology
2018 Member, Assistant Professor Search Committee, Department of Infectious Diseases
2017 Member, Professor in Medical Mycology Search Committee, Department of Microbiology
2017-present Member, Undergraduate Affairs Committee, Infectious Diseases
2016 Member, Assistant Professor Search Committee, Department of Cellular Biology
2014-present Member, PREP Scholar Admissions Committee
2013-2016 Member, University Council
2013-present Member, Undergraduate Affairs Committee, Microbiology
2011-2012 Member, Graduate Affairs Committee, Microbiology

Didactic Courses taught (percent credit):

Spring 2011 MIBO 4090/6090 Prokaryotic Biology (66%)
Spring 2011 CBIO (BIOL) 3400 Cellular Biology (16%)
Spring 2011 IDIS 8010 Advanced Infectious Diseases (3%)
Fall 2011 MIBO 4090/6090 Prokaryotic Biology (66%)

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Spring 2014 IDIS 8010 Advanced Infectious Diseases (3%)
Fall 2014 MIBO 4090/6090 Prokaryotic Biology (66%)
Spring 2015 MIBO 4090/6090 Prokaryotic Biology (66%)
Spring 2015 IDIS 8010 Advanced Infectious Diseases (3%)
Fall 2015 MIBO 4090/6090 Prokaryotic Biology (66%)
Fall 2015 BCMB 8212 Advanced Genetics, Cell, Biochemistry and Molecular Biology II (6%)
Spring 2016 MIBO 4090/6090 Prokaryotic Biology (66%)
Spring 2016 IDIS 8010 Advanced Infectious Diseases (3%)
Fall 2016 MIBO 4090/6090 Prokaryotic Biology (66%)
Spring 2017 MIBO 4090/6090 Prokaryotic Biology (66%)
Spring 2017 IDIS 8010 Advanced Infectious Diseases (3%)
Fall 2017 MIBO 4090/6090 Prokaryotic Biology (100%)
Spring 2018 IDIS 8010 Advanced Infectious Diseases (3%)
Fall 2018 MIBO 4090/6090 Prokaryotic Biology (100%)
Spring 2019 IDIS 8010 Advanced Infectious Diseases (3%)
Fall 2019 MIBO 4090/6090 Prokaryotic Biology (100%)
Spring 2020 IDIS 8010 Advanced Infectious Diseases (3%)
Spring 2020 IDIS 3100 People, Parasites, and Plagues (6%)

Supervised Graduate Research as Research Advisor:

This list includes graduate students from whom I served as their primary research advisor. Students in **bold** have graduated with their terminal graduate degree.

1. **Shannon M. Kraft**, Ph.D. program in Infectious Diseases
2. **Kevin M. O'Brien**, Ph.D. program in Microbiology
3. **Emily M. Carpinone**, Ph.D. program in Microbiology
4. Nathan Glueck, Ph.D. program in Microbiology
5. **Lindsay Wright**, Ph.D. program in Infectious Diseases (co-advisor with Dr. Mary Hondalus)
6. Michael K. Mills, Ph.D. program in Microbiology
7. Allyson Loy, Ph.D. program in Microbiology

Supervised Graduate Research as Graduate Advisory Committee Member:

This list includes graduate students from whom I served as a member on their graduate advisory committees; student PI is listed in parentheses, along with degree sought. Students in **bold** have graduated with their terminal graduate degree. Students marked with an asterisk (*) removed me from their committee prior to their graduation. Unless noted, students are from the Department of Microbiology at the University of Georgia.

1. Justin Duma (Maier, PhD)
2. Anushka Sarkar (Schmidt, PhD), Department of Biochemistry and Molecular Biology
3. Doreen Nguyen (Hoover, PhD)
4. Sydney Ronzulli (Tompkins, MS), Comparative Biomedical Sciences

5. **Kathrin Laramore (Stabb, MS)**
6. Amanda Skarlupka (Ross, PhD), Department of Infectious Diseases
7. Yuehan Li (Ye, PhD), Department of Physiology and Pharmacology
8. Lori Estes (Handa, PhD), College of Engineering
9. **Alan Schmalstig (Maier, PhD)**
10. **Joshua Chu (Hoover, MS)**
11. Longhuan Ma (Harvill, PhD), Department of Infectious Diseases
12. Silke Andresen (Szymanski, PhD)
13. Coralis Rodriguez-Garcia (Stabb/Ottesen, PhD)
14. Lauren Essler (Quinn, PhD)
15. Megan Prescott (Quinn, PhD)
16. **Jianfeng Lin** (Lin, PhD)
17. Mariel Pfeifer * (Khang, PhD)
18. **Theodoric Mattes (Escalante, PhD)**
19. **Amber Enriquez (Escalante, MS)**
20. **Kelsey Hansen (Hodge) (Downs, PhD)**
21. Stephen Vella (Moreno, PhD)
22. **Cody Thomas** * **(Szymanski, MS)**
23. **Priyadarshini Singha** (**Handa, PhD)**, College of Engineering
24. Donald Gillis * (Kvitko, MS)
25. **Ashley Hagen (Lewis, MS)**
26. Katherine Gibson (Haney) (Hoover, PhD)
27. Alexis Gibson * (Streipen, PhD)
28. David Cobb (Muldiharian, PhD), Department of Cellular Biology
29. Abigail Courtney (Lewis, PhD)
30. Aileen Ferraro (Lewis, PhD)
31. **Jordan Russell (Westpheling, PhD)**
32. **Olivia Thompson (Peterson, PhD)**
33. **Lisa Kuhns (Maier, PhD)**
34. **Crystal Austin (Phillips) (Maier, PhD)**
35. **Shannon Phan (He, PhD), Department of Infectious Diseases**
36. **Andrew Stasic (Moreno, PhD)**
37. Walter Woodside (Terns, PhD)
38. Victoria Jeter (Escalante, PhD)
39. **Samantha Tucker (Quinn/Karls, PhD)**
40. Rony Orobio-Hurtado * (McNealy, PhD) Clemson University Department of Biological Sciences
41. **Caitlin Williams (Reeves) (Krause, PhD)**
42. **John (Hank) Kimbrough (Stabb, PhD)**
43. **Julie Craft (Lechtreck, PhD), Department of Cellular Biology**
44. **Julie Stoudenmire (Stabb, PhD)**
45. **Christopher Cotter (Shimkets, PhD)**
46. **Sean Buskirk (Lafontaine, PhD), Department of Infectious Diseases**
47. **Shawn Zimmerman (Lafontaine, PhD), Department of Infectious Diseases**
48. **Teresa Shaffer (Lafontaine, PhD)**
49. **Stephanie Teat (Quinn, MS)**

Supervised Undergraduate Research:

This list includes undergraduates who conducted research for credit, for experience without formal credit, or as participants in either an NSF-supported summer Research Experience for Undergraduates (REU) program. The home institution of non-UGA students is indicated. All others are from UGA.

1. Benjamin Dyer, REU, Campbell University, 2010
2. Andrew Bernstein, 2010-2011
3. Jia Lee, 2010-2011

4. Gabrielle Joseph, 2011
5. Jennifer Barron, 2011-2012
6. Marquise Lawrence, REU, Norfolk State University, 2012
7. Kamyron Jordan, 2012-2014
8. Elizabeth Lindsay, REU, Brockport College, 2013
9. Chetan Hebbale, 2013-2016
10. Ivelisse Resto Garay, REU, University of Puerto Rico-Humacao, 2014
11. Emma Brannon, 2014-2018
12. Ashley Hagen, 2014-2015
13. Margaret Steward, REU, Delaware State University, 2015
14. Leanna Ritson, REU, Eckerd College, 2015
15. Victoria Webber, 2015-2016
16. Michael Mills, University of Georgia, PREP Scholar, 2015-2016
17. Rachel Rabenn, REU, Rochester Institute of Technology, 2016
18. Stephanie Duff, 2016
19. Nathalie Thezan, Long Island University, PREP Scholar, 2016-2017
20. Paola Lopez-Aguirre, 2016-2017
21. Alexandra Purcell, 2016
22. Brent Shuman, REU, Withrop University, 2017
23. Yenamala Reddy, 2017-2018
24. Maria Nadeau, REU, University of New Hampshire, 2019
25. Kaitlyn Kennedy, 2017-2018
26. Joseph Vanterpool 2018-2019
27. Delaney Ragsdale, 2018-2019
28. Kasidy Brown, 2018-2020
29. Jiacheng (Jackie) Chen, Wuhan University, 2019
30. Lindsey McCabe, 2018-
31. Lucinda Shaffer, 2019-
32. Lindsey Brock, 2019-
33. Marley Palmer, 2019-

Publications

Wei Peng, A.K. Casey, J. Fernandez, E.M. Carpinone, K.A. Servage, Z. Chen, Y. Li, D.R. Tomchick, **V.J. Starai**, and K. Orth. 2020. A distinct inhibitory mechanism of the V-ATPase by *Vibrio* VopQ revealed by cryo-EM. *Nat Struct Mol Biol. In press.*

Andrew J. Stasic, N.M. Chasen, E.J. Dykes, S.A. Vella, B. Asady, and **V.J. Starai**, and S.J.N. Moreno. 2019. The *Toxoplasma* Vacuolar H(+)-ATPase Regulates Intracellular pH and Impacts the Maturation of Essential Secretory Proteins. *Cell Rep*. 27(7):2132-2146.e7.

Evgeniy Potapenko, C.D. Cordeiro, G. Huang, M Storey, C. Wittwer, A.K. Dutta, H.J. Jessen, **V.J. Starai**, and R. Docampo. 2018. 5-Diphosphoinositol pentakisphosphate (5-IP(7)) regulates phosphate release from acidocalcisomes and yeast vacuoles. *J Biol Chem*. 293(49):19101-19112.

Emily M. Carpinone, Z. Li, M.K. Mills, C. Foltz, E.R. Brannon, C.K.S. Carlow, and **V.J. Starai**. 2018. Identification of putative effectors of the Type IV secretion system from the *Wolbachia* endosymbiont of *Brugia malayi*. *PLoS One*. 13(9):e0204736.

Lindsay M. Wright, E.M. Carpinone, T.L. Bennett, M.K. Hondalus, and **V.J. Starai**. 2018. VapA of *Rhodococcus equi* binds phosphatidic acid. *Mol Microbiol*. 107(3):428-444.

Kevin M. O'Brien, E.L. Lindsay, and **V.J. Starai**. 2015. The *Legionella pneumophila* effector protein, LegC7, alters yeast endosomal trafficking. *PLOS ONE*. 10(2):e0116824.

Anju Sreelatha, T.L. Bennett, E.M. Carpinone, K.M. O'Brien, K.D. Jordan, D.L. Burdette, K. Orth, and **V.J. Starai**. 2015. *Vibrio* effector protein VopQ inhibits fusion of V-ATPase-containing membranes. *Proc Natl Acad Sci U S A*. 112(1):100-5.

Anju Sreelatha, K. Orth, and **V.J. Starai**. 2013. The pore forming bacterial effector, VopQ, halts autophagic turnover. *Autophagy*. 9(12):2169-70.

Anju Sreelatha, T.L. Bennett, H. Zheng, Q.-X. Jiang, K. Orth, and **V.J. Starai**. 2013. *Vibrio* effector protein, VopQ, forms a lysosomal gated channel that disrupts host ion homeostasis and autophagic flux. *Proc Natl Acad Sci U S A*. 110(28):11559-64.

Terry M. Bennett, S.M. Kraft, B.J. Reaves, J. Mima, K.M. O'Brien, and **V.J. Starai**. 2013. LegC3, an effector protein from *Legionella pneumophila*, inhibits homotypic yeast vacuole fusion *in vivo* and *in vitro*. *PLoS One.* I8(2): e56798.

Vincent J. Starai, C. M. Hickey, and W. Wickner. 2008. HOPS proofreads the trans-SNARE complex for yeast vacuole fusion. *Mol Biol Cell.* 19:2500-8.

Vincent J. Starai, Y. Jun, and W. Wickner. 2007. Excess vacuolar SNAREs drive lysis and Rab-bypass fusion. *Proc Natl Acad Sci USA* (Feature Article). 104:13551-8.

Youngsoo Jun, N. Thorngren, **V. J. Starai**, R. A. Fratti, K. Collins, and W. Wickner. 2006. Reversible, cooperative reactions of yeast vacuole docking. *EMBO J.* 25:5260-9.

Vincent J. Starai, N. Thorngren, R.A. Fratti, and W. Wickner. 2005. Ion regulation of homotypic vacuole fusion in *Saccharomyces cerevisiae*. *J Biol Chem.* 280:16754-62.

Vincent J. Starai, J. Garrity, and Jorge C. Escalante-Semerena. 2005. Acetate excretion during growth of *Salmonella enterica* on ethanolamine requires phosphotransacetylase (EutD) activity, and acetate recapture requires acetyl-CoA (Acs) and phosphotransacetylase (Pta) activities. *Microbiology*. 151:3793-801.

Vincent J. Starai, J.G. Gardner, and Jorge C. Escalante-Semerena. 2005. Residue Leu-641 of Acetyl-CoA Synthetase is critical for the acetylation of residue Lys-609 by the protein acetyltransferase enzyme of *Salmonella enterica*. *J Biol Chem.* 280:26200-5.

Vincent J. Starai and Jorge C. Escalante-Semerena. 2004. Identification of the protein acetyltransferase (Pat) enzyme that acetylates acetyl-CoA synthetase in *Salmonella enterica. J Mol Biol.* 340:1005-12.

Vincent J. Starai and Jorge C. Escalante-Semerena. 2004. Acetyl-Coenzyme A Synthetase (Adenosine Monophosphate-Forming). Review. *Cell Mol Life Sci.* 61:2020-30.

V. J. Starai, H. Takahashi, J. D. Boeke and J. C. Escalante-Semerena. 2004. A Link Between Transcription and Intermediary Metabolism: A Role for Sir2 in the Control of Acetyl-Coenzyme A Synthetase. Review. *Curr Op Microbiol.* 7:115-119.

Sergio Palacios, **Vincent J. Starai**, and Jorge C. Escalante-Semerena. 2003. Propionyl-coenzyme A is a common intermediate in the 1,2-propanediol and propionate catabolic pathways needed for the expression of the *prpBCDE* operon during growth of *Salmonella enterica* on 1,2-Propanediol. *J Bacteriol.* 185:2802-2810.

Andrew M. Gulick, **Vincent J. Starai**, Alexander R. Horswill, Kristen M. Homick, and Jorge C. Escalante-Semerena. 2003. The 1.75 Å crystal structure of acetyl-CoA synthetase bound to adenosine-5'-propylphosphate and coenzyme A. *Biochemistry.* 42:2866-2873.

Vincent J. Starai, Hidekazu Takahashi, Jef D. Boeke, and Jorge C. Escalante-Semerena. 2003. Short-chain fatty acid activation by acyl-coenzyme A synthetases requires SIR2 protein function in *Salmonella enterica* and *Saccharomyces cerevisiae*. *Genetics.* 163:544-555.

V.J. Starai,, I. Celic, R.N. Cole, J.D. Boeke, and J. C. Escalante-Semerena. 2002. Sir2-dependent activation of acetyl-CoA synthetase by deacetylation of active lysine. *Science.* 298:2390-2392.

Smith, J. S., C. Baker-Brachmann, I. Celic, M. A. Kenna, S. Muhammad, **V. J. Starai,** J. Avalos, J. C. Escalante-Semerena, C. Grubmeyer, C. Wolberger, and J. D. Boeke. 2000. A phylogenetically conserved NAD^+-dependent protein deacetylase in the Sir2 protein family. *Proc Natl Acad Sci USA*. 97:6658-6663.

Research Support

Ongoing Research Support

2019/07/15-2021/07/14
R03 AI146907-01, National Institute of Allergy and Infectious Diseases (NIAID)
Hoover, Timothy (PI)
Control of Flagellation Pattern in *Helicobacter pylori*
The goal of this study is to examine the roles of the FlhF, FlhG, and FlhH proteins in *H. pylori* flagellar biosynthesis
Role: co-PI

2018/05/15-2021/04/30 (no-cost extension to 2022/04/30)
DBI-1757720, National Science Foundation
Starai, Vincent Joseph (PI)
REU Site: Molecular and Synthetic Microbiology
This training award fosters the laboratory training of undergraduate students in topics in microbial physiology.
Role: PI

Completed Research Support

2013/01/01-2017/12/31 (no-cost extension to 2019/07/31)
R01 AI100913-01A1, National Institute of Allergy and Infectious Diseases (NIAID)
Starai, Vincent Joseph (PI)
Bacterial inhibitors of eukaryotic membrane fusion
The goal of this study is to characterize the effects of secreted effector proteins from *Legionella pneumophila* on eukaryotic membrane fusion and dynamics.
Role: PI

2015/03/15-2018/02/28
DBI-1460671, National Science Foundation
Starai, Vincent Joseph (PI)
REU Site: Research in Prokaryotic Biology
This training award fosters the laboratory training of undergraduate students in topics in microbial physiology.
Role: PI