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Brigham Young University
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Updated 1/18/2024

EDUCATION AND TRAINING

Stanford University	Biological Sciences	B.Sc. (1999)
University of California, San Diego	Biological Sciences	Ph.D. (2004)
Stanford University	Biological Sciences	Postdoctoral scholar (2004-2006)

APPOINTMENTS

- **Professor** Department of Microbiology and Molecular Biology, Brigham Young University, Provo, UT 84602. (2018-present)
- **Chair** Department of Microbiology and Molecular Biology, Brigham Young University, Provo, UT 84602. (2020-2023)
- **Associate Professor** Department of Microbiology and Molecular Biology, Brigham Young University, Provo, UT 84602. (2012-2018)
- **Assistant Professor** Department of Microbiology and Molecular Biology, Brigham Young University, Provo, UT 84602. (2006-2012)
- **Visiting Associate Professor of Genetics** Department of Molecular Biology, Harvard University, Boston, MA 02114 (Jan-Aug 2015; Lab of Fred Ausubel)
- **Visiting Scientist, Department of Biology** Massachusetts Institute of Technology, Cambridge, MA 02139 (Jan-Aug 2015; Lab of Graham Walker)

GRIFFITTS LAB: CURRENT AND RECENT PROJECTS

- Development of *E. coli* strains that support in vivo DNA assembly
- Mechanism of gene regulation: The nickel-responsive *nre* operon from *Mesorhizobium*
- Discovery of novel antimicrobial peptides from random DNA libraries using *E. coli*
- Genetic mechanisms of salt tolerance in plant-associated microbes
- Use of *E. coli* to identify novel chromoproteins for biosensors and agar art
- Development of solution-phase protocols for DNA aptamer discovery

HONORS AND AWARDS

Ruth L. Kirschstein Postdoctoral Fellowship (declined)	(2004)
Helen Hay Whitney Postdoctoral Fellowship	(2005-2006)
NSF CAREER Award	(2011-2016)
Brigham Young University Young Scholar Award	(2013)
Presidential Early Career Award for Scientists and Engineers (PECASE)	(2014)
NSF Mid-Career Investigator Award	(2015)
Brigham Young University College of Life Sciences Outstanding Research Award	(2016)
Robertson Endowed Professorship (College of Life Sciences)	(2025)
Sam and Aline Skaggs Mentoring Fellowship	(2026)

FUNDING

Skaggs Mentoring Fellowship

PI: Joel Griffitts (BYU) College of Life Sciences \$20,000 2026

Genetic and ecological drivers of microbial adaptation to high-nickel serpentine soils

PI: Joel Griffitts (BYU) NSF IOS-1755446 \$276,838 2018-2023

The structural basis of spatially constrained enzymatic promiscuity

PI: Joel Griffitts (BYU) NIH 1R15GM132852-01 \$337,500 2019-2023

A rhizobial peptidase that interferes with plant nitrogen acquisition

PI: Joel Griffitts (BYU) USDA 2015-67013-22915 \$457,914 2015-2019

CAREER: The molecular basis of abortive symbiosis

PI: Joel Griffitts (BYU) NSF IOS-1054980 \$652,446 2011-2016

Occupy Rhizosphere: How Bacterial Communities Self-assemble on Plant Surfaces

PI: Joel Griffitts (BYU) BYU Mentoring Env Grant \$20,000 2013-2014

Modulation of two-component signaling in Alphaproteobacteria

PI: Joel Griffitts (BYU) NIH 1R15AI082504-01 \$225,000 2009-2012

Bacterial Signaling Pathways Required for Symbiotic Infection

PI: Joel Griffitts (BYU) BYU Mentoring Env Grant \$20,000 2009-2010

The Molecular Basis of Host Range in the Rhizobium-Legume Symbiosis

PI: Joel Griffitts (BYU) BYU Mentoring Env Grant \$20,000 2008-2009

PUBLICATIONS

1. Jensen KT, Griffitts JS. Regulation of a nickel tolerance operon conserved in *Mesorhizobium* strains from serpentine soils. *Appl Environ Microbiol.* **2025** Dec 23;91(12):e0140325. doi: 10.1128/aem.01403-25. Epub 2025 Nov 4.
2. Quaye A, Pickett BE, Griffitts JS, Berges BK, Poole BD. Turkey B cell transcriptome profile during turkey hemorrhagic enteritis virus (THEV) infection highlights upregulated apoptosis and breakdown pathways that may mediate immunosuppression. *Viruses.* **2025** Feb 21;17(3):299. doi: 10.3390/v17030299.
3. Moss MM, Taylor BJ, Griffitts JS, Kenealey JD. Simultaneous production of D-allulose and D-tagatose from lactose. *International Dairy J.* 2024 Oct;157:106022 doi: 10.1016/j.idairyj.2024.106022.
4. Quaye A, Pickett BE, Griffitts JS, Berges BK, Poole BD. Characterizing the splice map of Turkey Hemorrhagic Enteritis Virus. *Virol J.* 2024 Aug 6;21(1):175. doi: 10.1186/s12985-024-02449-0.
5. Church BM, Geary B, Griffitts J, Drake CL, Ruebelmann K, Nelson SV, Madsen MD. Development of a Rhizobium Seed Coating to Establish Lupine Species on Degraded Rangelands. *Plants (Basel).* 2024 Jul 29;13(15):2101. doi: 10.3390/plants13152101.
6. Calvopina-Chavez DG, Bursley DM, Tseng Y-J, Patil LM, Bewley KD, Bennallack PR, McPhie JM, Wagstaff KB, Daley A, Miller SM, Moody JD, Price JC, Griffitts JS. Micrococccin cysteine-to-thiazole conversion through transient interactions between the scaffolding protein TcII and the modification enzymes TcIJ and TcIN. *Appl Environ Microbiol.* 2024 Jun 18;90(6):e0024424. doi: 10.1128/aem.00244-24. Epub 2024 May 23.
7. Free TJ, Talley JP, Hyer CD, Miller CJ, Griffitts JS, Bundy BC. Engineering the Signal Resolution of a Paper-Based Cell-Free Glutamine Biosensor with Genetic Engineering,

- Metabolic Engineering, and Process Optimization. *Sensors* (Basel). 2024 May 12;24(10):3073. doi: 10.3390/s24103073.
8. Kehlet-Delgado H, Montoya AP, Jensen KT, Wendlandt CE, Dexheimer C, Roberts M, Torres Martínez L, Friesen ML, Griffiths JS, Porter SS. The evolutionary genomics of adaptation to stress in wild rhizobium bacteria. *Proc Natl Acad Sci U S A*. 2024 Mar 26;121(13):e2311127121. doi: 10.1073/pnas.2311127121. Epub 2024 Mar 20.
 9. Howarth RE, Pattillo CM, Griffiths JS, Calvopina-Chavez DG. Three genes controlling streptomycin susceptibility in *Agrobacterium fabrum*. *J Bacteriol*. 2023 Sep 26;205(9):e0016523. doi: 10.1128/jb.00165-23. Epub 2023 Sep 11.
 10. Liu J, Wang T, Qin Q, Yu X, Yang S, Dinkins RD, Kuczmog A, Putnoky P, Muszyński A, Griffiths JS, Kereszt A, Zhu H. Paired Medicago receptors mediate broad-spectrum resistance to nodulation by *Sinorhizobium meliloti* carrying a species-specific gene. *Proc Natl Acad Sci U S A*. 2022 Dec 20;119(51):e2214703119. doi: 10.1073/pnas.2214703119. Epub 2022 Dec 12.
 11. Calvopina-Chavez DG, Howarth RE, Memmott AK, Pech Gonzalez OH, Hafen CB, Jensen KT, Benedict AB, Altman JD, Burnside BS, Childs JS, Dallon SW, DeMarco AC, Flindt KC, Grover SA, Heninger E, Iverson CS, Johnson AK, Lopez JB, Meinzer MA, Moulder BA, Moulton RI, Russell HS, Scott TM, Shiobara Y, Taylor MD, Tippets KE, Vainerere KM, Von Wallwitz IC, Wagley M, Wiley MS, Young NJ, Griffiths JS. A large-scale genetic screen identifies genes essential for motility in *Agrobacterium fabrum*. *PLoS One*. 2023 Jan 4;18(1):e0279936. doi: 10.1371/journal.pone.0279936. eCollection 2023.
 12. Montoya AP, Wendlandt CE, Benedict AB, Roberts M, Piovia-Scott J, Griffiths JS, Porter SS. Hosts winnow symbionts with multiple layers of absolute and conditional discrimination mechanisms. *Proc Biol Sci*. 2023 Jan 11;290(1990):20222153. doi: 10.1098/rspb.2022.2153. Epub 2023 Jan 4.
 13. Wendlandt CE, Roberts M, Nguyen KT, Graham ML, Lopez Z, Helliwell EE, Friesen ML, Griffiths JS, Price P, Porter SS. Negotiating mutualism: A locus for exploitation by rhizobia has a broad effect size distribution and context-dependent effects on legume hosts. *J Evol Biol*. 2022 Jun;35(6):844-854. doi: 10.1111/jeb.14011. Epub 2022 May 4.
 14. Calvopina-Chavez DG, Gardner MA, Griffiths JS. Engineering efficient termination of bacteriophage T7 RNA polymerase transcription. *G3 (Bethesda)*. 2022 May 30;12(6):jkac070. doi: 10.1093/g3journal/jkac070.
 15. Benedict AB, Chamberlain JD, Calvopina DG, Griffiths JS. Translation initiation from sequence variants of the bacteriophage T7 g10RBS in *Escherichia coli* and *Agrobacterium fabrum*. *Mol Biol Rep*. 2022 Jan;49(1):833-838. doi: 10.1007/s11033-021-06891-z. Epub 2021 Nov 7.
 16. Hunt JP, Zhao EL, Free TJ, Soltani M, Warr CA, Benedict AB, Takahashi MK, Griffiths JS, Pitt WG, Bundy BC. Towards detection of SARS-CoV-2 RNA in human saliva: A paper-based cell-free toehold switch biosensor with a visual bioluminescent output. *N Biotechnol*. 2022 Jan 25;66:53-60. doi: 10.1016/j.nbt.2021.09.002. Epub 2021 Sep 21.
 17. Benedict AB, Ghosh P, Scott SM, Griffiths JS. A conserved rhizobial peptidase that interacts with host-derived symbiotic peptides. *Sci Rep*. 2021 Jun 3;11(1):11779. doi: 10.1038/s41598-021-91394-x.
 18. Wendlandt C, Helliwell E, Roberts M, Nguyen K, Friesen ML, von Wettberg E, Price P, Griffiths J, Porter SS. Decreased coevolutionary potential and increased symbiont fecundity during the biological invasion of a legume-rhizobium mutualism. *Evolution*. 2021 Mar;75(3):731-747. doi: 10.1111/evo.14164. Epub 2021 Feb 2.
 19. do Amaral FP, Tuleski TR, Pankiewicz VCS, Melnyk RA, Arkin AP, Griffiths J, Tadra-Sfeir MZ, Maltempi de Souza E, Deutschbauer A, Monteiro RA, Stacey G. Diverse Bacterial

- Genes Modulate Plant Root Association by Beneficial Bacteria. *mBio*. 11(6):e03078-20 (2020).
20. GC diCenzo, M Zamani, A Checcucci, M Fondi, JS Griffiths, TM Finan, A Mengoni. Multidisciplinary approaches for studying rhizobium-legume symbioses. *Can J Microbiol*. 65(1):1-33 (2019).
 21. GC diCenzo, AB Benedict, M Fondi, GC Walker, TM Finan, A Mengoni, JS Griffiths. Robustness encoded across essential and accessory replicons of the ecologically versatile bacterium *Sinorhizobium meliloti*. *PLoS Genet*. 14(4):e1007357 (2018).
 22. A Metagenome-wide association study and arrayed mutant library confirm *Acetobacter* lipopolysaccharide genes are necessary for association with *Drosophila melanogaster*.
 23. KM White, MK Matthews, RC Hughes, AJ Sommer, JS Griffiths, PD Newell, JM Chaston.
 24. *G3 (Bethesda)*. 8(4):1119-1127 (2018).
 25. MA Olson, TW Siebach, JS Griffiths, E Wilson, DL Erickson. Genome-Wide Identification of Fitness Factors in Mastitis-Associated *Escherichia coli*. *Appl Environ Microbiol*. Jan 2;84(2) (2018).
 26. MFF Arnold, M Shabab, J Penterman, KL Boehme, JS Griffiths, GC Walker. Genome-wide sensitivity analysis of the microsymbiont *Sinorhizobium meliloti* to symbiotically important, defensin-like host peptides. *mBio*. 8(4):e01060-17 (2017).
 27. S Yang, Q Wang, E Fedorova, J Liu, Q Qin, Q Zheng, PA Price, H Pan, D Wang, JS Griffiths, T Bisseling, H Zhu. Microsymbiont discrimination mediated by a host-secreted peptide in *Medicago truncatula*. *Proc Natl Acad Sci USA*. 114(26):6848-6853 (2017).
 28. PR Bennallack, JS Griffiths. Elucidating and engineering thiopeptide biosynthesis. *World J Microbiol Biotechnol*. 33(6):119 (2017).
 29. KD Bewley, PR Bennallack, MA Burlingame, RA Robison, JS Griffiths, Miller SM. Capture of micrococcin biosynthetic intermediates reveals C-terminal processing as an obligatory step for in vivo maturation. *Proc Natl Acad Sci USA*. 113(44):12450-12455 (2016).
 30. M Shabab, MF Arnold, J Penterman, AJ Wommack, HT Bocker, PA Price, JS Griffiths, EM Nolan, GC Walker. Disulfide cross-linking influences symbiotic activities of nodule peptide NCR247. *Proc Natl Acad Sci USA*. 113(36):10157-62 (2016).
 31. PR Bennallack, KD Bewley, MA Burlingame, RA Robison, SM Miller, JS Griffiths. Reconstitution and Minimization of a Micrococcin Biosynthetic Pathway in *Bacillus subtilis*. *J Bacteriol*. 198(18):2431-8 (2016).
 32. PA Price, HR Tanner, BA Dillon, M Shabab, GC Walker, JS Griffiths. Rhizobial peptidase HrrP cleaves host-encoded signaling peptides and mediates symbiotic compatibility. *Proc Natl Acad Sci USA*. 112(49):15244-9 (2015).
 33. RD VanYperen, TS Orton, JS Griffiths. Genetic analysis of signal integration by the *Sinorhizobium meliloti* sensor kinase FeuQ. *Microbiology* 161(Pt 2):244-53 (2014).
 34. PR Bennallack, SR Burt, MJ Heder, RA Robison, JS Griffiths. Characterization of a novel plasmid-borne thiopeptide gene cluster in *Staphylococcus epidermidis* strain 115. *J Bacteriol*. 196:4344-50 (2014).
 35. MB Crook, AL Draper, RJ Guillory, and JS Griffiths. The *Sinorhizobium meliloti* essential porin RopA1 is a target for numerous bacteriophages. *J. Bacteriol*. 195:3663-71 (2013).
 36. MB Crook, DP Lindsay, MB Biggs, JS Bentley, JC Price, SC Clement, MJ Clement, SR Long, and JS Griffiths. Rhizobial plasmids that cause impaired symbiotic nitrogen fixation and enhanced host invasion. *Mol Plant Microbe In* 25:1026-33 (2012).
 37. CL Harrison, MB Crook, G Peco, SR Long, and JS Griffiths. Employing site-specific recombination for conditional genetic analysis in *Sinorhizobium meliloti*. *Appl Environ Microbiol* 77:3916-22 (2011).

38. RE Carlyon, JL Ryther, RD VanYperen, and JS Griffiths. FeuN, A novel modulator of two-component signaling identified in *Sinorhizobium meliloti*. *Mol Microbiol* 77:170-82 (2010).
39. D Wang, JS Griffiths, C Starker, E Federova, E Limpens, S Ivanov, T Bisseling, and SR Long. A nodule specific protein secretory pathway required for nitrogen-fixing symbiosis. *Science* 327:1126-9 (2010).
40. TT Steele, CW Fowler, and JS Griffiths. Control of gluconate utilization in *Sinorhizobium meliloti*. *J Bacteriol* 191:1355-8 (2009).
41. JS Griffiths, RE Carlyon, JH Erickson, JL Moulton, MJ Barnett, CJ Toman, and SR Long. A *Sinorhizobium meliloti* osmosensory two-component system required for cyclic glucan export and symbiosis. *Mol Microbiol* 69:479-90 (2008).
42. JS Griffiths and SR Long. A symbiotic mutant of *Sinorhizobium meliloti* reveals a novel genetic pathway involving succinoglycan biosynthetic functions. *Mol Microbiol* 67:1292-306 (2008).
43. BD Barrows, JS Griffiths, RV Aroian. Resistance is non-futile: Resistance to Cry5B in the nematode *Caenorhabditis elegans*. *J Invertebr Pathol* 95:198-200 (2007).
44. BD Barrows, JS Griffiths, and RV Aroian. *Caenorhabditis elegans* carbohydrates in bacterial toxin resistance. *Methods Enzymol* 417:340-58 (2006).
45. M Capello, RD Bungiro, LM Harrison, LJ Bischof, JS Griffiths, BD Barrows, RV Aroian. A purified *Bacillus thuringiensis* crystal protein with therapeutic activity against the hookworm parasite *Ancylostoma ceylanicum*. *Proc Natl Acad Sci USA*. 103:15154-9 (2006).
46. JS Griffiths, SM Haslam, T Yang, S Garczynski, B Mulloy, PS Cremer, A Dell, MJ Adang and RV Aroian. Glycolipids as receptors for *Bacillus thuringiensis* Crystal toxin. *Science* 307:922-5 (2005).
47. JS Griffiths and RV Aroian. Many roads to resistance: How invertebrates adapt to Bt toxins. *Bioessays* 27:614-24 (2005).
48. DL Huffman, LJ Bischof, JS Griffiths, RV Aroian. Pore worms: Using *Caenorhabditis elegans* to study how bacterial toxins interact with their target hosts. *Int J Med Microbiol* 293:599-607 (2004).
49. JS Griffiths, DL Huffman, JL Whitacre, BD Barrows, LD Marroquin, R Muller, JR Brown, T Hennes, JD Esko and RV Aroian. Resistance to a bacterial toxin is mediated by removal of a conserved glycosylation pathway required for toxin-host interactions. *J Biol Chem* 278:45594-602 (2003).
50. JS Griffiths, JL Whitacre, DE Stevens and RV Aroian. Bt toxin resistance from loss of a putative carbohydrate-modifying enzyme." *Science* 293:860-4 (2001).
51. LD Marroquin, D Elyassnia, JS Griffiths, JS Feitelson and RV Aroian. "*Bacillus thuringiensis* (Bt) toxin susceptibility and isolation of resistance mutants in the nematode *Caenorhabditis elegans*." *Genetics* 155:1693-9 (2000).
52. SR Cutler, DW Ehrhardt, JS Griffiths, and CR Somerville. Random GFP::cDNA fusions enable visualization of subcellular structures in cells of *Arabidopsis* at a high frequency. *Proc Natl Acad Sci* 97:3718-23 (2000).

GRIFFITTS MENTEES, 2025

Kyson Jensen (PhD student; microbial Ni tolerance pathways)
 Misha Iqbal (PhD student; in vivo DNA end joining in *E. coli*)
 Iqra Farooq (PhD student; microbial enhancement of salt tolerance in alfalfa)
 Caleb Parker (Undergrad and PhD student; antimicrobial peptide discovery)
 Matthew Steed (Undergrad; antimicrobial peptide discovery)
 Adam Dunn (Undergrad; antimicrobial peptide discovery)

Steven Medina (Undergrad; antimicrobial peptide discovery)
Jackson Salmon (Undergrad; bacterial salt tolerance)
Anna Bowman (Undergrad; chromoprotein discovery and expression)
Kyler Fullmer (Undergrad; chromoprotein discovery and expression)
Blake Olson (Undergrad; chromoprotein discovery and expression)
Heinen Louis (Honors undergrad; DNA aptamer development)
Kyle Brunson (Undergrad; DNA aptamer development)

SERVICE ON GRADUATE COMMITTEES, 2025

1. Kyson Jensen (PhD, Chair)
2. Misha Iqbal (PhD, Chair)
3. Iqra Farooq (PhD, Chair)
4. Caleb Parker (PhD, Chair)
5. Tyler Brown (PhD, Member)
6. Rachael David-Prince (PhD, Member)
7. Michael Moran (MS, Member)
8. Hyrum Pech (PhD, Member)
9. Carlton Collins (PhD, Member)
10. Samantha Lloyd (MS, Member)
11. Abraham Quaye (PhD, Member)
12. Mady Telford (Member; PhD student at UT-Austin)

GRIFFITTS LAB PRESENTATIONS, 2025

Joel Griffiths “High-throughput discovery of compact antimicrobial peptides” (oral)
Plenary session, ASM Intermountain Branch Meeting (2025)

Kyson Jensen, Joel Griffiths “Identification and Characterization of a Transcriptional Regulator Associated with Nickel Tolerance” (oral)
Lightning session, ASM Intermountain Branch Meeting (2025)

Anna Bowman and Kyler Fullmer “Engineering Novel Chromoprotein Variants” (poster)
Poster session, ASM Intermountain Branch Meeting (2025)

Caleb Parker “Discovering New Antimicrobial Peptides I” (poster)
Poster session, ASM Intermountain Branch Meeting (2025)

Matthew Steed “Discovering New Antimicrobial Peptides II” (poster)
Poster session, ASM Intermountain Branch Meeting (2025)

Matthew Steed “A novel expression system for screening antimicrobial peptides” (poster)
Life Sciences Research Conference, BYU (2025)

PRESENTATIONS (Griffitts as presenter, off-campus, cumulative)

Invited Speaker: “High-throughput discovery of compact antimicrobial peptides” ASM Intermountain Branch Meeting, Idaho State University (2025)

Poster: “A saturating screen for *Agrobacterium* flagellar motility mutants carried out in an undergraduate laboratory course.” ASM-Microbe, Washington, DC (2022)

Invited speaker: “Teaching microbiology up close, from afar.” ASM Intermountain Branch Meeting, Weber State University (2020).

Invited speaker: “The Illusion of cooperation in the legume-rhizobium symbiosis.” Department of Bacteriology, University of Wisconsin-Madison (2019).

Poster: “Thiopeptide processing: Enzymology that is both highly specific and remarkably relaxed.” Wind River Conference on Prokaryotic Biology, Estes Park CO (2019).

Invited speaker: “The illusion of cooperation in the legume-rhizobium symbiosis” Gordon Research Conference on Microbial Stress Response, South Hadley MA (2018).

Invited speaker: “A peptide-based dialogue controlling symbiotic compatibility.” North American Symbiotic Nitrogen Fixation Conference, Winnipeg, Manitoba, Canada (2018).

Invited Speaker: “The illusion of cooperation in the legume-rhizobium symbiosis.” AgBiome, Inc. Research Triangle Park, NC (2017).

Invited Speaker: “Pathway analysis: Reviewing and reconsidering how I conduct science at BYU” BYU Microbiology and Molecular Biology Department Seminar (2017).

Invited Speaker: “Plant-bacterial interactions.” UK/US Workshop on Plant Health, British Embassy, Washington DC (2016).

Invited Speaker: “How rhizobial accessory plasmids impact symbiotic negotiations” MPMI International Congress, Portland OR (2016).

Invited Speaker: “Modulation of symbiotic compatibility by a rhizobial peptidase.” USDA Project Director Meeting, San Diego, CA (2016).

Invited Speaker: “Nature-inspired engineering of peptide antibiotics.” ASM Branch Meeting, University of Utah (2016).

Invited Speaker: “A Peptide-Based Dialogue Between Legumes and Symbiotic Rhizobia.” ASPB Western Section Meeting, Brigham Young University (2016).

Invited Speaker: “Symbiosis in three dimensions.” New England Symbiosis Workshop, Massachusetts Institute of Technology (2015).

Invited Speaker: “Listening in on symbiotic deliberations between legumes and nitrogen-fixing rhizobia.” University of Massachusetts, Amherst (2015).

Invited Speaker: “A peptide-based symbiotic dialogue between rhizobia and legumes.” University of Massachusetts Medical School (2015).

Invited Speaker: “Getting to Fix: Negotiating compatibility in the legume-rhizobium symbiosis.” Department of Plant Biology, University of Vermont (2014).

Invited Speaker: “Can we program life? Reading, writing, and editing DNA” BYU Honors Great Questions Seminar (2014).

Invited Speaker: “*Sinorhizobium* plasmids that block nitrogen fixation.” Stanford Symbiosis Meeting (Sharon Long Lab 20-year Reunion) (2013).

Invited Speaker: “Understanding Instability in the Rhizobium-Legume Symbiosis.” San Diego State University (2012).

Invited Speaker: “Rules for Symbiotic Matchmaking.” UC Merced Quantitative and Systems Biology Seminar Series (2012).

Invited Speaker: “Bacteria: Harmful or Helpful?” Research Revolutions Seminar Series at the Orem Public Library (2012).

Invited Speaker: “Rhizobium plasmids that impair symbiotic nitrogen fixation and enhance host invasion.” Molecular Genetics of Bacteria and Phages Conference, University of Wisconsin-Madison (2011).

Invited Speaker: “Molecular rules for compatibility between legumes and symbiotic rhizobia.” Utah Valley University (2010).

Invited Speaker: “Determinants of strain-host specificity in the *Sinorhizobium-Medicago* symbiosis.” 21st North American Symbiotic Nitrogen Fixation Conference, University of Missouri (2010).

Invited Speaker: “Determinants of compatibility in the legume-rhizobium symbiosis.” ASM Branch meeting, Provo, UT (2010).

Invited Speaker: “What is Life? How we know what we know about molecular biology.” BYU Honors Program Seminar Series (2010).

“Are we a good match? Determinants of compatibility in the legume-rhizobium symbiosis.” BYU Microbiology and Molecular Biology Department Seminar (2009).

“A novel 3-component system required for cyclic glucan secretion.” 16th International Conference on Nitrogen Fixation, Big Sky, MT (2009).

Invited Speaker: “Marrying the classic and contemporary in microbial genetics.” ASM Conference for Undergraduate Educators, Colorado State University (2009).

Invited Speaker: “Two-component signaling in a mutualistic host-microbe interaction.” Molecular Genetics of Bacteria and Phages, Cold Spring Harbor (2008).

“Transport functions in symbiosis.” 13th International Congress on Molecular Plant-microbe Interactions (2007).

“Transport functions in symbiosis.” 20th North American Symbiotic Nitrogen Fixation Conference (2007).

“Host and microbial contributions to symbiosome function.” 12th International Congress on Molecular Plant-microbe Interactions (2005).

Invited Speaker: “Insights on Cry toxin mechanism of action.” Carnegie Institution of Washington, Department of Plant Biology (2004).

Featured Graduate Student Speaker: “Prelude to intoxication: How a bacterial pore-forming toxin discerns its target.” Annual retreat for the UC San Diego Division of Biological Sciences (2003).

Invited Speaker: “Glycosyltransferases mediate Bt toxin action in *C. elegans*.” 35th meeting of the Society for Invertebrate pathology (2002).

Invited Speaker: “Glycosyltransferases mediate Bt toxin action in *C. elegans*.” West Coast *C. elegans* Meeting (2002).

Invited Speaker: “Loss of a putative carbohydrate-modifying enzyme leads to Bt toxin resistance in *C. elegans*.” 34th meeting of the Society for Invertebrate Pathology (2001).

“Bt toxicity through a genetic lens: bre-5 and carbohydrate modification.” International *C. elegans* meeting (2001).

“Studies on the nematicidal *Bacillus thuringiensis* toxins.” West Coast *C. elegans* meeting (2000).

COURSES TAUGHT (cumulative)

- UNIV 101: Foundations for Student Success (2024 to present)
- MMBIO 240: Molecular Biology (yearly, 2010-2014, 2025 to present)
- MMBIO 442: Adv Molecular Biology Lab (yearly, 2024 to present)
- MMBIO 360: Bacterial Genetics (undergraduate lecture and lab; yearly, 2007-2024)
- MMBIO 390R: Pioneers in Molecular Biology (2006, 2012, 2014, 2024)
- MMBIO 663: Articulating Science (graduate writing) (yearly, 2016-2023)
- MMBIO 661: Molecular Genetics in Practice (graduate course) (2009-2019, 2024)
- MMBIO 662: Genomics, Evolution and Development (graduate course) (2015)
- MMBIO 626: Advanced Bacterial Genetics (graduate course) (every other year, 2012-2016)
- MMBIO 494R: Mentored Research (undergraduate lab research mentoring) (2006-present)
- HONRS 395R: The Birth of Molecular Biology (2010)

SERVICE

- MMBIO Faculty Development Committee (2023-present)
- College of Life Sciences Rank and Status Committee (2025-present)
- *Ad hoc* Academic Misconduct Committee (BYU; 2024-2025)
- BYU College of Life Sciences Sesquicentennial Committee (2024-2025)
- Chair, BYU Department of Microbiology and Molecular Biology (2020-2023)
- BYU Department Chair Coordinating Council (2021-2023)
- BYU College of Life Sciences Belonging Committee (2020-2024)
- Chair, MMBIO Graduate Development Committee (2012-2020)
- Member, MMBIO Graduate Development Committee (2006-2012)
- University Honors Faculty Council (2011-2015)
- BYU College of Physical and Mathematical Sciences Dean Search Committee (2017)
- Coordinator: Current Topics in Molecular Life Sciences Seminar Series (2008-2013)
- Internal grant review committees: ORCA/MEG/CURA (2007-present)
- Proposal review for funding agencies:
 - National Science Foundation/IOS, panelist (yearly: 2010-2023, 2025)
 - Natural Sciences and Engineering Research Council (Canada) (2017)
 - US Department of Agriculture/NIFA (2013)
 - National Institutes of Health (2012)
 - Medical Research Council (UK) (2008)
- Treasurer, Intermountain Branch of the American Association for Microbiology (2016-2020)
- President, Intermountain Branch of the American Association for Microbiology (2013-2014)
- Session organizer and chair, International Congress of Molecular Plant-Microbe Interactions (Portland, OR, 2016),
- Expert participant, USA-UK Plant Health Workshop held at the British Embassy in Washington DC (2016)
- Manuscript peer review:
J Bacteriology, Microbiology, Molecular Plant, Applied and Environmental Microbiology, Microbial Ecology, Molecular Microbiology, Journal of Visualized Experiments, PLOS Biology, PLOS One, PLOS Genetics, PNAS, Molecular Plant-Microbe Interactions, Scientific Reports, mBio, New Phytologist, Curr Op in Plant Biology, BMC Microbiology, Viruses, Molecular Genetics and Genomics, Microorganisms, mSystems, Frontiers Microbiology, Genes, FEMS Microbiology Reviews, Nucleic Acids Research, and others