**Jaclyn M. Winter, Ph.D.**

University of Utah

L.S. Skaggs Pharmacy Institute

Department of Pharmacology and Toxicology

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**EDUCATION**

**Years Degree Institution (Area of Study)**

2005 − 2010 Ph.D. Scripps Institution of Oceanography, University of California,

San Diego (Marine Natural Product Biosynthesis) Professor Bradley Moore. San Diego, CA

1999 − 2004 B.S. State University of New York College at Fredonia

(Chemistry and Molecular Genetics), Fredonia, NY

**LICENSES/CERTIFICATIONS**

2018 − Present United States Department of Justice Drug Enforcement Administration: Controlled Substance - Researcher, Clinical (RW0535508)

Handle, heterologously produce, and purchase the Schedule I narcotics psilocybin and psilocin

**UNIVERSITY OF UTAH ACADEMIC HISTORY**

**Pharmacology and Toxicology**

2023 − Present Associate Professor

**Medicinal Chemistry**

2022 − 2023 Associate Professor

2015 − 2022 Assistant Professor

**PROFESSIONAL EXPERIENCE**

**Full-Time Positions**

2023 − Present Co-host, Natural Prodcast with Dr. Dan Udwary

2014 Co-Lecturer, University of California, Los Angeles, Los Angeles, CA

2011 − 2014 Postdoctoral Researcher, Professor Yi Tang, University of California, Los Angeles, Los Angeles, CA

2010 − 2011 Postdoctoral researcher, Professor Christian Hertweck, Institute for Natural Product Research and Infection Biology, Hans Knoll Institute, Jena

2005 − 2010 Graduate research assistant, Scripps Institution of Oceanography, San Diego, CA

2003 Intern, Vaccine Division at Merck & Co., Inc., West Point, PA

**HONORS AND AWARDS**

2020 − 2021 Overall College of Pharmacy Teacher of the Year, University of Utah

2020 − 2021 Second Professional Year Teacher of the Year, College of Pharmacy, University of Utah

2019 Selected as a presenter for the Senior Vice President of Health Science’s vitae event, University of Utah

2019 Recognized as a Top Researcher at the Celebrate U event for the College of Pharmacy, University of Utah

2018 − 2020 Scialog Fellow for Chemical Machinery of the Cell, Research Corporation for Science Advancement and the Gordon and Betty Moore Foundation

2017 − 2018 Overall College of Pharmacy Teacher of the Year, University of Utah

2017 − 2018 Third Professional Year Teacher of the Year, College of Pharmacy, University of Utah

2017 Invited Panelist at the Breaking Barriers Initiative, Breaking Barriers Dialogue Series, Office for Inclusion and Outreach, University of Utah, Salt Lake City, UT, USA

2016 − 2018 Vice President's Clinical and Translational Scholars Program, University of Utah

2012 − 2013 L'Oréal/AAAS USA Postdoctoral Fellowship for Women in Science, USA

2008 Outstanding Student Oral Presenter at the Society of Industrial Microbiology Meeting, San Diego, CA, USA

2007 Claude ZoBell Fellowship Award, Scripps Institution of Oceanography, San Diego, CA, USA

2006 − 2008 NIH Marine Biotechnology Predoctoral Ruth L. Kirschstein National Research Service Award, Scripps Institution of Oceanography, San Diego, CA, USA

2004 Roy Keller Award for Undergraduate Researcher of the Year, State University of New York College at Fredonia, Fredonia, NY, USA

2004 Merck/AAAS Travel Grant, State University of New York College at Fredonia, Fredonia, NY, USA

2002 − 2004 Merck/AAAS Undergraduate Research Fellowship, State University of New York College at Fredonia, Fredonia, NY, USA

**Awards and honors by Trainees In the Winter Lab**

2023 **Georgia Morgan** was awarded a Gehlert Fellowship, University of Utah

2022 **Stephanie Heard** received an outstanding poster presenter award at the SIMB annual meeting in San Francisco

2022 **Stephanie Heard** was selected to give an oral presentation at the SIMB annual meeting in San Francisco

2022 **Stephanie Heard** received a best poster award at the RSC Directing Biosynthesis Meeting in Edinburgh

2022 – 2023 **Abby Scott** was awarded a Skaggs Graduate Research Fellowship, University of Utah

2022 – 2023 **Georgia Morgan** was awarded a Graduate Research Fellowship, University of Utah

2022 – 2024 **Elijah Bring Horvath** was awarded a Graduate Research Fellowship through the 3i Initiative, University of Utah

2022 **Ama Boamah** was awarded a Lynn Brady Travel Award from the American Society of Pharmacognosy

2021 – 2022 **Elijah Bring Horvath** was awarded an ARUP Graduate Research Fellowship through the College of Pharmacy, University of Utah

2021 **Ama Boamah** was awarded an American Society of Pharmacognosy summer research fellowship

2021 **Ama Boamah** was awarded the Posse Summer Leadership Award through the Posse Foundation at Smith College

2020 **Stephanie Heard** was selected to give an oral presentation at the GRS Marine Natural Products conference (part of the Gordon Research Conference), Ventura, CA

2020 – 2021 **Stephanie Heard** was awarded the Skaggs Graduate Research Fellowship through the College of Pharmacy, University of Utah

2019 –2020 **Stephanie Heard** was awarded an ARUP Graduate Research Fellowship through the College of Pharmacy, University of Utah

2019 **Stephanie Heard** received a University of Utah Graduate Student Travel Assistance Award

2019 **Stephanie Heard** was selected as a poster finalist at the American Society of Pharmacognosy Annual Meeting, Madison, WI

2016-2017 **Heilly Galvez** was awarded an Undergraduate Research Fellowship, University of Utah

**PEER-REVIEWED PUBLICATIONS**

+ = Co-corresponding authors \* = Co-first authors

40. Wu, G.; **Winter, J. M.** Identification and Characterization of a Hybrid Type I and Type II Fungal Terpene Cyclase.*In preparation.*

39. Morgan, G. A.; Zhang, P.; **Winter, J. M.** Enhancing the Chemical Diversity of Fungal Natural Products Through Tailoring Reactions. *In preparation.*

38. Heard, S. C. and **Winter, J. M.** Predicting Substrate Specificity of Fungal Adenylation Domains using a Structure-Guided Approach. *In Preparation.*

37. Bring Horvath, E. R.; Brazelton, W. J.; Kim, M-C.; Cullum, R.; Fenical, W.; **Winter, J. M.** (2023) Bacterial Diversity and the Chemical Ecology of Natural Product Producing Bacteria from Great Salt Lake. *Under Review.*

36*.* Heard, S. C. and **Winter, J. M.** (2023) Structural, Biochemical, and Bioinformatic Analyses of Nonribosomal Peptide Synthetase Adenylation Domains. *Under Review.*

35. Heard, S. C.; Diehl, K. L.; **Winter, J. M.** (2023) Biosynthesis of the Fungal Nonribosomal Peptide Penilumamide A and Biochemical Characterization of a Pterin-Specific Adenylation Domain. *Under Review.*

34. Li, F.; Lai, S.; Yuan, W.; Chen, Z.; Guan, Z.; Chen, C.; Zhu, H.; Zhou, Y.; **Winter, J. M.**; Liu, J.; Ye, Y.; Zhang, Y. (2023) Computationally Designed Single Residue Mutation on a Diterpene Synthase Redirects the Cyclization Pathways through Redistribution of Enzyme-Bound Intermediate Conformers. *Under revision*.

33. Kim, M-C.; **Winter, J. M.**;+ Cullum, R.; Smith, A. Fenical, W.+ (2023) Bioinformatic Analysis Aids in Assigning the Stereostructures of Marinolides A and B, 24- and 26-Membered Macrolactones from a Chemically Exceptional Marine-Derived Bacterium. *Marine Drugs*. 21, 367.

Spotlight article included in the 20 Years Commemorative Issue in Honor of Professor Paul J. Scheuer

32. Terlouw, B. R.;\* Blin, K.;\* Navarro-Munoz, J. C.; Avalon, N.; Chevrette, M. G.; Egbert, S.; Lee, S.; Meijer, D.; Recchia, M. J. J.; Reitz, Z. L.; van Santen, J. A.; Selem-Mojica, N.; Torring, T.; Zaroubi, L.; Alanjary, M.; Aleti, G.; Aquilar, C.; Al-Salihi, S. A. A.; Augustijn, H. E.; Avelar-Rivas, J. A.; Avitia-Dominguez, L. A.; Barona-Gomez, F.; Bernaldo-Aguero, J.; Bielinski, V. A.; Biermann, F.; Booth, T. J.; Carrion Bravo, V. J.; Castelo-Branco, R.; Chagas, F. O.; Cruz-Morales, P.; Du, C.; Duncan, K. R.; Gavriilidou, A.; Gayrard, D.; Gutierrez-Garcia, K.; Haslinger, K.; Helfrich, E. J. N.; van der Hooft, J. J. J.; Jati, A. P.; Kalkreuter, E.; Kalyvas, N.; Bin Kang, K.; Kautsar, S.; Kim, W.; Kunjapur, A.; Li, Y.-X.; Lin, G.-M.; Loureiro, C.; Louwen, J. J. R.; Louwen, N. L. L.; Lund, G.; Parra, J.; Philmus, B.; Pourmohsenin, B.; Pronk, L. J. U.; Rego, A.; Arokia Balaya Rex, D.; Robinson, S.; Rosas-Becerra, L. R.; Roxborough, E. T.; Schorn, M. A.; Scobie, D. J.; Saurabh Singh, K.; Sokolova, N.; Tang, X.; Udwary, D.; Vigneshwari, A.; Vind, K.; Vromans, S. P. J. M.; Waschulin, V.; Williams, S. E.; **Winter, J. M**.; Witte, T. E.; Xie, H.; Yang, D.; Yu, J.; Zdouc, M.; Zhong, Z.; Collemare, J.; Linington, R. G.; Weber, T.; Medema M. H. (2022) MIBiG 3.0: A Community-Driven Effort to Annotate Experimentally Validated Biosynthetic Gene Clusters. *Nuc Acids Res. 51,* D1, D603-D610.

31. Bradshaw, A. J.; Dentinger, B.; Backman, T.; Ramírez-Cruz, V.; Forrister, D.; **Winter, J. M.;** Furci, G.; Stamets, P.; Guzmán-Dávalos, L. (2022) DNA Authentication and Chemical Analysis of *Psilocybe* Mushrooms Reveal Widespread Taxonomic Misdeterminations and Inconsistencies in Metabolites. *Appl. Environ Microbiol.* 88, e0149822.

Spotlight article and cover of the issue.

30. Heard, S. C. and **Winter, J. M.** (2022) Biosynthesis of the Fungal Nonribosomal Peptide Penilumamide A and Biochemical Characterization of a Pterine-Specific Adenylation Domain. *bioRxiv* 2022.08.30.505926.

29. Zhang, P.;\* Wu, G.;\* Heard, S. C.; Niu, C.; Bell, S. A.; Li, F.; Ye, L.; Zhang, Y.; **Winter, J. M.** (2022) Identification and Characterization of a Cryptic Bifunctional Type I Diterpene Synthase Involved in Talaronoid Biosynthesis from a Marine-Derived Fungus. *Org Lett.* 24, 7037-7041.

28. Chen, P. Y-T.; Sanjoy, A.; Chekan, J.; Liscombe, D.; Miyanaga, A.; Bernhardt, P.; Diethelm, S.; Fielding, E.; George, J.; Miles, Z.; Murray, L.; Steele, T.; **Winter, J. M.**; Noel, J.; Moore, B. (2022) Structural Basis of Stereospecific Vanadium-Dependent Haloperoxidase Family Enzymes in Napyradiomycin Biosynthesis. *Biochemistry.* 61, 1844-1852.

27. **Winter, J. M.** (2021) A Community Effort: Combining Functional Amplicon Sequencing and Metagenomics Reveals Potential Biosynthetic Gene Clusters Associated with Protective Phenotypes in Rhizosphere Microbiomes. *mSystems*, 6, e0058721.

26. Shin, Y-H.; Ban, Y. H.; Shin, J.; Park, I. W.; Yoon, S.; Ko, K.; Shin, J.; Nam, S-J.; **Winter, J. M**.; Kim, Y.; Yoon, Y. J.; Oh, D-C. (2021) Azetidine-Bearing Non-Ribosomal Peptides, Bonnevillamides D and E, Isolated from a Carrion Beetle-Associated Actinomycete. *J Org Chem*, 86, 11149-11159.

25. Kim, M-C.; **Winter, J. M.;**+ Asolkar, R. N.; Boonlarppradab, C.; Cullum, R.; Fenical, W.+ (2021) Marinoterpins A-C: Rare Linear Merosesterterpenoids from Marine-Derived Actinomycete Bacteria of the Family Streptomycetaceae. *J Org Chem*, 86, 11140-11148.

24. Wu, G.; Dentinger, B. T. M.; Nielson, J. R.; Peterson, R. T.; **Winter, J. M.** (2021). Emerimicins V-X, 15 Residue Peptaibols Discovered from an *Acremonium* sp. through Integrated Genomic and Chemical Approaches. *J Nat Prod,* 84, 1113-1126.

23. Heard, S. C.; Wu, G.;+ **Winter, J. M.**+ (2021). Antifungal Natural Products. *Curr Opin Biotechnol*, 69, 232-241.

22. Heard, S. C.; Wu, G.; **Winter, J. M.** (2020). Discovery and Characterization of a Cytochalasan Biosynthetic Cluster from the Marine-Derived Fungus *Aspergillus flavipes* CNL-338. *J Antibiot (Tokyo)*, 73(11), 803-807.

21. Kim, M-C.;\* **Winter, J. M.**;\* Cullum, R.; Zhifei, L.; Fenical, W. (2020). Complementary Genomic, Bioinformatics and Chemical Approaches Facilitate the Absolute Structure Assignment of Ionostatin, a Linear Polyketide from a Rare Marine-Derived Actinomycete. *ACS Chem Biol*, 15(9), 2507.

20. Torres, J. P.; Lin, Z.; **Winter, J. M.**; Krug, P. J.; Schmidt, E. W. (2020). Animal Biosynthesis of Complex Polyketides in a Photosynthetic Partnership. *Nat Commun*, 11(1), 2882.

19. Shang, Z.; **Winter, J. M.;**+ Kauffman, C. A.; Yang, I.; Fenical, W.+ (2019) Salinipeptins: Integrated Genomic and Chemical Approaches Reveal D-Amino Acid-Containing Ribosomally Synthesized and Post-Translationally Modified Peptides from a Great Salt Lake *Streptomyces* sp. *ACS Chem Biol*, 14(3), 415-425.

Highlighted in Chemistry World <https://www.chemistryworld.com/news/new-family-of-peptides-from->extremophile-show-antibiotic -promise/3010257.article.

18. Awan, A.R.; **Winter, J. M.;** Turner, D.; Shaw, W. M.; Suz, L. M.; Bradshaw, A. J.; Ellis, T.; Dentinger, B. T. M. (2018). Convergent Evolution of Psilocybin Biosynthesis by Psychedelic Mushrooms. *bioRxiv*, 374199(doi: https://doi.org/10.1101/374199).

17. Wu, G.; Nielson, J. R.; Peterson, R. T.; **Winter, J. M.** (2017). Bonnevillamides, Linear Heptapeptides Isolated from a Great Salt Lake-Derived *Streptomyces* sp. *Mar Drugs*, 15(7), 195.

16. Agarwal, V.; Miles, Z. D.; **Winter, J. M.**; Eustaquio, A.S.; El Gamal, A. A.; Moore, B.S. (2017). Enzymatic Halogenation and Dehalogenation: Pervasive and Mechanistically Diverse. *Chem Rev*, 117, (8), 5619-5674.

15. Sato, M.; Dander, J. E.; Sato, C.; Hung, Y.; Gao, S-S.; Tang, M-C.; Hang, L.; **Winter, J. M.;** Garg, N. K.; Watanabe, K.; Tang, Y. (2017). Collaborative Biosynthesis of Maleimide- and Succinimide-Containing Natural Products by Fungal Polyketide Megasynthases. *J Am Chem Soc*, 139, 5317-5320.

14. Sato, M.; **Winter, J. M.**; Noguchi, H.; Tang, Y.; Watanabe, K. (2016). Combinatorial Generation of Chemical Diversity by Redox Enzymes in Chaetoviridin Biosynthesis. *Org Lett*, 18(6), 1446-1449.

13. Cochrane, R. V. K.; Gao, Z.; Lambkin, G. R.; Xu, W.; **Winter, J. M.**; Marcus, S. L.; Tang, Y.; Vederas, J. C. (2015). Comparison of 10,11-Dehydrocurvularin Polyketide Synthases from *Alternaria cinerariae* and *Aspergillus terreus* Highlights Key Structural Motifs. *Chembiochem*, 16 (17), 2479-2483.

12. **Winter, J. M.**; Cascio, D.; Dietrich, D.; Sato, M.; Watanabe, K.; Sawaya, M. R.; Vederas, J. C.; Tang, Y. (2015). Biochemical and Structural Basis for Controlling Chemical Modularity in Fungal Polyketide Biosynthesis. *J Am Chem Soc*, 137(31), 9885-9893.

11. **Winter, J. M.** & Tang, Y. (2014). Natural Products: Getting a Handle on Peptides. *Nat Chem*, 6(12), 1037-1038.

10. **Winter, J. M.**; Chiou, G.; Bothwell, I.; Xu, W.; Garg, N. K.; Luo, M. K.; Tang, Y. (2013). Expanding the Structural Diversity of Polyketides by Exploring the Cofactor Tolerance of an Inline Methyltransferase Domain. *Org Lett*, 15(14), 3774-3777.

9. **Winter, J. M.**; Sato, M.; Sugimoto, S.; Chiou, G.; Garg, N. K.; Tang, Y.; Watanabe, K. (2012). Identification and Characterization of the Chaetoviridin and Chaetomugilin Gene Cluster in *Chaetomium globosum* Reveals Dual Functions of an Iterative Highly-Reducing Polyketide Synthase. *J Am Chem Soc*, 134(43), 17900-17903.

8. **Winter, J. M.**, & Tang, Y. (2012). Synthetic Biological Approaches to Natural Product Biosynthesis. *Curr Opin Biotechnol*, 23, (5), 736-743.

7. **Winter, J. M**.; Behnken, S.; Hertweck, C. (2011). Genomics-Inspired Discovery of Natural Products. *Curr Opin Chem Biol*, 15, (1), 22-31.

6. Udwary, D. W.; Gontang, E. A.; Jones, A. C.; Schultz, A. W.; Sorrels, C. M.; **Winter, J. M.;** Yang, J. Y.; Beauchemin, N.; Capson, T. L.; Clark, B. R.; Esquenazi, E.; Eustaquio, A. S.; Freel, K.; Gonzalez, D. J;, Gerwick, L.; Gerwick, W. H.; Liu, W.; Malloy, K. L.; Maloney, K. N.; Nett, M.; Nunnery, J. K.; Penn, K.; Prieto-Davo, A.; Simmons, T. L.; Weitz, S.; Wilson, M. C.; Tisa, L. S.; Dorrestein P. C.; Moore, B. S. (2011). Significant Natural Product Biosynthetic Potential of Actinorhizal Symbionts of the Genus *Frankia*, as Revealed by Comparative Genomic and Proteomic Analyses. *Appl Environ Microbiol*, 77(11), 3617-3625.

5. Bernhardt, P.; Okino, T.; **Winter, J. M.**; Miyanaga, A.; Moore, B. S. (2011). A Stereoselective Vanadium-Dependent Chloroperoxidase in Bacterial Antibiotic Biosynthesis. *J Am Chem Soc*, 133 (12), 4268-4270.

4. **Winter, J. M.,** & Moore, B. S. (2009). Exploring the Chemistry and Biology of Vanadium-Dependent Haloperoxidases. *J Biol Chem*, 284, (28), 18577-18581.

3. **Winter, J. M.**; Jansma, A. L.; Handel, T. M.; Moore, B. S. (2009). Formation of the Pyridazine Natural Product Azamerone by Biosynthetic Rearrangement of an Aryl Diazoketone. *Angew Chem Int Ed Engl*, 48(4), 767-770.

2. **Winter, J. M.**; Moffitt, M. C.; Zazopoulos, E.; McAlpine, J. B.; Dorrestein, P. C.; Moore, B. S. (2007). Molecular Basis for Chloronium-Mediated Meroterpene Cyclization: Cloning, Sequencing, and Heterologous Expression of the Napyradiomycin Biosynthetic Gene Cluster. *J Biol Chem*, 282 (22), 16362-16368.

1. Cifuentes, M.; Schilling, B.; Ravindra, R.; **Winter, J. M.**; Janik, M. E. (2006). Synthesis and Biological Evaluation of B-ring Modified Colchicine and Isocolchicine Analogs. *Bioorg Med Chem Lett*, 16(10), 2761-2764.

**OTHER PUBLICATIONS**

**Patents**

1.

**Editorials**

2. Naman, C. B.; **Winter, J. M.**; VanderMolen, K. (2020). #ASPYM2020- Younger Member Events and Research Symposium Go Virtual. American Society of Pharmacognosy Newsletter (56, pp. 21-23).

1. **Winter, J. M.** (2007). Mentoring in ASP: A Mentee's Perspective. American Society of Pharmacognosy Newsletter (43, pp. 10-11).

**Published Abstracts**

2. **Winter, J. M.** (2020) Exploring the Chemical Potential of Great Salt Lake Microorganisms. XVI International Symposium on Marine Natural Products/XI European Conference on Marine Natural Products. *Mar Drugs*, 18(1):40

1. Bell, S., & **Winter, J. M.** (2015). Elucidation of the Mangicol and Neomangicol Biosynthetic Pathway from the Marine Fungi *Fusarium equiseti* CNC-477. *Planta Med*, 81, PF3.

**FUNDING**

**Active Grants**

09/01/2022 ‒ 08/31/2025W81XWH2210800

Combating Multidrug-Resistant Urinary Tract Infections in Spinal Cord Injury Patients

Department of Defense

Principal Investigator: Matthew Mulvey

Role: Project Lead

01/01/2022 ‒ 12/31/2022 Surveillance of Emerging Resistance Patterns in Urinary Tract Infections

Margolis Foundation

Principal Investigator: Jaclyn M. Winter

Role: Principal Investigator

07/01/2021 – 06/30/2026 R01AI155694

Genomics-Assisted Antibiotic Discovery from Unprecedented Microbes from the Great Salt Lake

National Institute of Allergy and Infectious Diseases

Principal Investigator: Jaclyn M. Winter

Co-Investigator: William Fenical, Scripps Institution of Oceanography

Role: Principal Investigator

03/01/2021 – 02/28/2022 Antibiotic Discovery using Great Salt Lake Microorganisms

University of Utah Research Foundation

Principal Investigator: Jaclyn M. Winter

Role: Principal Investigator

11/16/21 – 05/13/2023 GBMF7621

Cost-extension for Microorganism Communication

Gordon and Betty Moore Foundation

Principal Investigator(s): Jaclyn M. Winter

Role: Principal Investigator

01/01/20 – 12/31/20

(Extended due to COVID) NGS-62142R-19

Natural Consumption and Evolution of the New Zealand Psychedelic False Truffle *Psilocybe weraroa*

National Geographic Society

Principal Investigator(s): Bryn Dentinger

Role: Co- Investigator

10/18/18 – 05/13/23 GBMF7621

Microorganism Communication

Gordon and Betty Moore Foundation

Principal Investigator: Jaclyn M. Winter

Role: Principal Investigator

09/01/17 – Present Education Resource Development Council

University of Utah College of Pharmacy

Principal Investigator: Jaclyn M. Winter

Role: Principal Investigator

**Past Grants**

10/01/17 – 09/30/18 Elucidating Gene Regulation in Filamentous Fungi for Antibiotic Discovery

American Society of Pharmacognosy

Principal Investigator: Jaclyn M. Winter

Role: Principal Investigator

07/24/17 – 06/30/19 America’s Dead Sea: A Resource for Novel Anti-Cancer Drugs

Skaggs Scholars Program, University of Colorado

Principal Investigator(s): Rajesh Agarwal and Jaclyn M. Winter

Role: Co-Principal Investigator

03/15/16 – 03/14/18 W81XWH-15-1-0380

Novel Systemically-Active Galanin Analogs for the Treatment of Pain

Department of Defense Peer Reviewed Medical Research Program

Principal Investigator: Brian Klein

Role: Collaborator

**ADMINISTRATIVE EXPERIENCE**

**Offices Held in Professional Organizations**

2022– Present Member of the EDI Committee, American Society of Pharmacognosy

2020 – Present Member of the Jobs Committee, American Society of Pharmacognosy

2020 – 2021 Member of the Newsletter Committee, American Society of Pharmacognosy

2019 – 2020 Member of the Scientific Organizing Committee for the 2020 International Congress on Natural Products Research

2019 – 2020 Member of the Conference Committee, American Society of Pharmacognosy

2016 – 2020 Chair, American Society of Pharmacognosy, Younger Members Committee

**Grant Review Committee/Study Section**

2023 Ad Hoc Reviewer for National Institute of Allergy and Infectious Diseases, Drug Discovery and Molecular Pharmacology A (DMPA) Study Section (Nov 7-8, 2023)

2022– Present Stage 1 mail reviewer for the NIH Director’s DP1 Pioneer Award

2021– 2022 Ad Hoc Reviewer for National Institute of Allergy and Infectious Diseases, Drug Discovery and Mechanisms of Antimicrobial Resistance (DDR) Study Section (Jul 13-14, 2021; March 1-2, 2022; June 23-24, 2022 and the Dec 16th “DDR member conflict” study sections).

2021– Present Scientific Reviewer, Luxembourg National Research Fund

2021 Ad Hoc Reviewer for National Institute of General Medical Sciences, Biological Chemistry and Macromolecular Biophysics Integrated Review Group, Special Emphasis Panel (Nov 22, 2021 meeting)

2019 – Present First Round Reviewer, Gordon and Betty Moore Foundation

2018 – Present First Round Reviewer, L'Oréal USA for Women in Science Program

2015 – 2020 Scientific Reviewer, Genome Quebec Inc.

**Symposium/Meeting Chair/Coordinator**

2025 Co-Organizer, Society of Industrial Microbiology and Biotechnology Natural Products Meeting, San Diego, USA

2024 Co-Chair, FUSION, Synthetic Biology of Natural Products, Cancun, Mexico

2022 Co-Chair, Chemical Biology section, Rising Stars Symposium, University of Utah

2022 Convener, Society of Industrial Microbiology and Biotechnology conference, San Francisco, CA, USA

2022 Session chair, Synthetic Biology for Natural Product Drug Production and Engineering, Marine Natural Products Gordon Research Conference, Ventura, CA, USA

2021 Session chair, Dec 18th Biosynthesis of Natural Products morning session, Pacifichem, Honolulu, HI, USA

2021 Convener, New Natural Products and New Sources session, Society of Industrial Microbiology and Biotechnology conference, Austin, TX, USA

2020 Co-organized, moderated, and chaired the Younger Members virtual symposium for the American Society of Pharmacognosy, Summer 2020: 250 attendees from 35 countries.

2020 Convener, New Natural Products and New Sources session, Society of Industrial Microbiology and Biotechnology conference, San Francisco, CA (Canceled due to COVID)

2019 – 2020 Chair, Genomics in Natural Products Research session, International Congress on Natural Products Research, San Francisco, CA, USA (Canceled due to COVID)

2018 Moderator, Fungal and Plant II session for the Keystone Symposia on Natural Products and Synthetic Biology: Parts and Pathways, Olympic Valley, CA, USA

**PROFESSIONAL ORGANIZATION MEMBERSHIPS**

2013 – Present Member, American Association for the Advancement of Science

2013 – Present Member, American Chemical Society

2015 – Present Member, American Society of Pharmacognosy

2021 – Present Member, Affiliate member, Royal Society of Chemistry

2021 – Present Member, Society of Industrial Microbiology & Biotechnology

2015 – 2019 Member, American Association of Colleges of Pharmacy

**UNIVERSITY COMMUNITY ACTIVITIES**

**University Level**

2023 – Present Co-Director, T32 Program for Interdisciplinary Training in Chemical Biology (PITCH), Biological Chemistry Graduate Program

2022 – Present Committee Member, Academic Senate Executive Committee

2021 – Present Committee Member, Academic Senate Personnel & Elections Committee

2021 – Present Committee Member, Academic Senate

2018 – Present Scientific Advisory Board, Immunology, Inflammation and Infectious Diseases Initiative

2017 – 2020 Committee Member, Presidential Commission on the Status of Women

2016 – 2019 Steering Committee Member, Women in Medicine & Science

**College Level**

2015 – Present Faculty Sponsor & Student Mentor, College of Pharmacy

2020 – Present Biosafety Committee, College of Pharmacy

2019 – 2021 PharmD Project Mentor, College of Pharmacy

**Department Level**

2023– Present Member, GTC, Pharmacology and Toxicology

2022 – 2023 Search Committee, Molecular Pharmaceutics and Biomedical Engineering

2021 – 2022 Search Committee, Medicinal Chemistry

2020 – 2021 Search Committee, Medicinal Chemistry

2019 – 2020 Search Committee, Medicinal Chemistry

2017 – 2018 Search Committee, Biochemistry

2016 – 2017 Search Committee, Biochemistry

2016 – 2017 Search Committee, Pharmacology and Toxicology, USTAR position in cancer therapeutics

**Programs, Centers & Institutes**

2023 – Present Mentor, VPCAT Program

2023 – Present Recruiting Co-Chair, Biological Chemistry Graduate Program

2020 – Present Steering Committee Member, Biological Chemistry Graduate Program

2016 – Present T32 Steering Committee Member, Biological Chemistry Graduate Program, Program for Interdisciplinary Training in Chemical Biology (PITCH)

2015 – Present Member, Biological Chemistry Graduate Program

2018 – 2019 Admission Committee Chair, Biological Chemistry Graduate Program

2017 – 2018 Curriculum Chair, Biological Chemistry Graduate Program

2016 – 2017 Co-Curriculum Chair, Biological Chemistry Graduate Program

2015 – 2019 Member, Biological Chemistry Graduate Program, Admissions Committee

**MENTORING**

**Faculty Mentoring Committee**

2022– Present Dr. Yue Lu, Department of Molecular Pharmaceutics, University of Utah

**Trainee Supervision**

**Postdoctoral Fellow**

2021– Present Advisor/Mentor, Changshan Niu, University of Utah

2019 – Present Advisor/Mentor, Peng Zhang, University of Utah

2019 – 2021 Advisor/Mentor, David Gallegos, University of Utah

2016 – 2018 Advisor/Mentor, Emilio Cortez, University of Utah

2016 – 2020 Advisor/Mentor, Guangwei Wu, University of Utah

2015 – 2017 Advisor/Mentor, Stephen Bell, University of Utah

**PhD/Doctorate**

2021 – Present PhD Advisor, Georgia Morgan, University of Utah

2021 – Present PhD Advisor, Abby Scott, University of Utah

2020 – Present PhD Advisor, Eli Horvath, University of Utah

2019 – 2021 PharmD, Project Mentor, Uonita Khachoomian, University of Utah

2019 PharmD, PSURF Mentor, Abbey Smith, University of Utah

2019 PharmD, PSURF Mentor, Matthew Savas, University of Utah

2017 PhD Advisor, Cy Perkins, University of Utah

2017 – Present PhD Advisor, Stephanie Heard, University of Utah

**Undergraduate**

2022 – Present Advisor/Mentor, Chelsea Bordon, University of Utah

2022 – Present Advisor/Mentor, Emilio Del Toro, Boston College

2021 – Present Advisor/Mentor, Grace Gould, University of Utah

2021 – Present Advisor/Mentor, Ama Boamah, Smith College, Diversity Fellowship

2019 – 2020 Advisor/Mentor, Adar Livni, University of Utah

2017 – 2018 Advisor/Mentor, Chris Fullmer, Utah Valley University

2016 Advisor/Mentor, Vidya Subrahmanyam, University of Utah

2016 Advisor/Mentor, Wilson Chen, University of Utah

2015 – 2018 Advisor/Mentor, Heilly Galvez, University of Utah

2012 – 2014 Advisor/Mentor, Frank Sun, University of California, Los Angeles

2007 – 2010 Advisor/Mentor, Michelle Hook, Scripps Institution of Oceanography

2007 Advisor/Mentor, Tracy Mrowczysnki, Scripps Institution of Oceanography

**High School**

2022 Advisor/Mentor, Avery Kelly, University of Utah

2022 Advisor/Mentor, Megan Selmer, University of Utah

2021 Advisor/Mentor, Jayce Clark, University of Utah

2018 – 2020 Advisor/Mentor, Jeannette Dimpel, University of Utah

2018 Advisor/Mentor, Tom Shreeve, University of Utah

2017 Advisor/Mentor, Jonathan Villareal, University of Utah

2016 – 2019 Advisor/Mentor, Randy Chou, University of Utah

2016 Advisor/Mentor, Georgia Alley, University of Utah

2016 – 2019 Advisor/Mentor, Varesh Gorabi, University of Utah

2015 Advisor/Mentor, Parke Ross, University of Utah

2013 Advisor/Mentor, Mikala Cohen, University of California, Los Angeles, Henry Samueli School of Engineering and Applied Science Outreach Program

2013 Advisor/Mentor, Karthik Raju, University of California, Los Angeles, Henry Samueli School of Engineering and Applied Science Outreach Program

**Graduate Student Thesis Committees**

2022– Present Member, Braden Fallon, University of Utah, Biochemistry

2022– Present Member, Sanaz Habibi, University of Utah, Chemistry

2022– Present Member, Dakota Brady, University of Utah, Biochemistry

2022– Present Member, Alyssa Thompson, University of Utah, Chemistry

2021– Present Member, Colin Campbell, University of Utah, Chemistry

2021– Present Member, Saswata Nayak, University of Utah, Chemistry

2021 – Present Chair, Georgia Morgan, University of Utah, Medicinal Chemistry

2021 – Present Chair, Abby Scott, University of Utah, Medicinal Chemistry

2020 – 2022 Member, Alexander Bradshaw, University of Utah, Biological Sciences

2020 – Present Chair, Eli Horvath, University of Utah, Medicinal Chemistry

2020 – Present Member, Shwan Javdan, University of Utah, Bioengineering

2020 – 2023 Member, Nicole Rueb, University of Utah, Medicinal Chemistry

2020 – 2023 Member, Ying Cong, University of Utah, Medicinal Chemistry

2020 – 2023 Member, Youjung Sung, University of Utah, Medicinal Chemistry

2019 External Thesis Member, Leon Liang, University of Prince Edward Island, Marine Natural Products

2019 – 2023 Member, Arthi Venugopalan, University of Utah, Medicinal Chemistry

2019 – Present Member, Magali Ayala, University of Utah, Pathology

2019 Master Thesis External Examiner, Gregory Harm, Western Sydney University, School of Science and Health

2018 – Present Member, Tanya Espino, University of Utah, Biochemistry

2018 – Present Member, Kendall Heitmeier, University of Utah, Chemistry

2018 – 2022 Member, Edgar Dalles Keyes, University of Utah, Chemistry

2018 – 2022 Member, Snigdha Sarkar, University of Utah, Medicinal Chemistry

2017 – 2020 Member, Brandon McCullough, University of Utah, Medicinal Chemistry

2017 – 2021 Member, Jonas Renner, University of Utah, Chemistry, Chemistry

2017 – 2018 Member, Kyle Nogales, University of Utah, Chemistry, Chemistry

2017 – 2021 Member, Wenjia Gu, University of Utah, Medicinal Chemistry

2017 – 2020 Member, Joshua Torres, University of Utah, Medicinal Chemistry

2017 – 2020 Member, Spencer Brown, University of Utah, Medicinal Chemistry

2017 – 2022 Chair, Stephanie Heard, University of Utah, Medicinal Chemistry

2017 – 2022 Member, Christine Nervig, University of Utah, Medicinal Chemistry

2017 – 2020 Member, Cody MacDonald, University of Utah, Bioengineering

2016 – 2021 Member, Jing-Yao Guo, University of Utah, Chemistry

2016 – 2018 Member, Branden Stepanski, University of Utah, Chemistry

2015 – 2021 Member, Anindita Roy, University of Utah, Medicinal Chemistry

2015 – 2018 Member, Yiling Bi, University of Utah, Medicinal Chemistry

2015 Member, Ashaimaa Moussa, University of Utah, Medicinal Chemistry

**ORAL PRESENTATIONS**

**Invited Keynote/Plenary Lectures**

2023 XIII European Congress on Marine Natural Products and XVII International Symposium on Marine Natural Products joint meeting, to be held in Granada, Spain

2023 Discovery and Engineering of Natural Products for Human Health, 7th Annual Center for Chemical and Synthetic Biology (CCSB) meeting, University of Ottawa, Ottawa, Canada

2021 Unlocking the Chemical Potential of the Fungal Terpenome, 3rd International Conference of Marine Fungal Natural Products, University Cote-d’ Azur, Nice, France (Virtual)

2019 Chemical Potential of Great Salt Lake Microorganisms, XVI International Symposium on Marine Natural Products, Peniche, Portugal

**Invited Talks National**

2023 Society of Industrial Microbiology and Biotechnology annual meeting, Minneapolis, MN

2023 Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways, Waterville, NH

2023 Society of Industrial Microbiology and Biotechnology, Natural Products Biosynthesis Meeting, San Diego, CA

2022 Unlocking the Chemical Potential of the Terpenome from Marine-Derived Fungi, American Society of Pharmacognosy annual meeting, Charleston, SC, USA

2022 Harnessing the Chemical Potential of Unprecedented Microorganisms from Great Salt Lake, Salty Seminary Series, Great Salt Lake Institute, USA (virtual)

2021 Exploring the Chemical Potential of Great Salt Lake Microorganisms, Pacifichem, Honolulu, HI (virtual)

2021 Unlocking the Chemical Potential of the Fungal Terpenome, American Society of Pharmacognosy, Natural Product Sciences Webinar (virtual)

2021 Harnessing the Chemical Potential of Unprecedented Microbes from the Great Salt Lake, Society of Industrial Microbiology and Biotechnology, Austin, TX

2021 Harnessing the Chemical Potential of Unprecedented Microbes from the Great Salt Lake, Perlman Symposium, University of Wisconsin, Madison, WI (Virtual)

2021 Exploring the Chemical Potential of Unprecedented Microorganisms from the Great Salt Lake, Scripps Institution of Oceanography, San Diego, CA (Virtual)

2020 Exploring the Chemical Potential of Great Salt Lake Microorganisms, Pacifichem, Honolulu, HI (Postponed to 2021)

2020 Exploring the Chemical Potential of Great Salt Lake Microorganisms, University of Southern California, Department of Pharmacology and Pharmaceutical Sciences, Los Angeles, CA (Virtual)

2020 Harnessing the Chemical Potential of Unprecedented Microbes from the Great Salt Lake, The Scientist webinar series on Extreme Biotech: Understanding Extremophile Biology to Impact Human Health (Virtual)

2020 Harnessing the Chemical Potential of Unprecedented Microbes from the Great Salt Lake, University of North Texas, Department of Chemistry, Denton, TX (Virtual)

2020 Genomics-Assisted Antibiotic Discovery from Unprecedented Microbes of the Great Salt Lake, Perlman Symposium, University of Wisconsin, Madison, WI (Canceled due to COVID)

2020 Developing Microorganisms for Drug Discovery, Department of Chemistry and Chemical Biology, University of New Mexico (Canceled due to COVID)

2020 Unlocking the Chemical Potential of the Fungal Terpenome, Gordon Research Conference on Marine Natural Products, Ventura, CA

2020 Developing Microorganisms for Drug Discovery, National Cancer Institute, Frederick, MD

2019 Scialog: Chemical Machinery of the Cell Conference, Research Corporation for Science Advancement and the Gordon and Betty Moore Foundation, Tucson, AZ

2019 Exploring the Chemical Potential of Great Salt Lake Microorganisms, American Society of Pharmacognosy Annual Meeting, Madison, WI

2019 Developing Microorganisms for Drug Discovery, Immunology, Inflammation, & Infectious Disease Annual Symposium, University of Utah, UT

2019 Developing Microorganisms for Drug Discovery, Department of Chemistry, Oregon State, Corvallis, OR

2018 Scialog: Chemical Machinery of the Cell Conference, Research Corporation for Science Advancement and the Gordon and Betty Moore Foundation, Tucson, AZ

2018 Engineering a Heterologous Expression Platform for Fungal Terpene Biosynthesis, Poulter Endowed Lectureships, Department of Chemistry, University of Utah, Salt Lake City, UT

2018 Marine Fungal Workshop, Marine Biological Laboratories, Woods Hole, MA

2018 Moving from Mentee to Mentor, Vice President's Clinical and Translational Scholars Program, Peer to Peer Sessions, University of Utah, Salt Lake City, UT

2018 The Chemical Potential of Great Salt Lake Microorganisms, Chemical Ecology Symposium of Natural Products, University of Utah, Salt Lake City, UT, USA

2018 Developing Microorganisms for Drug Discovery, American Association of Pharmaceutical Scientists-Rocky Mountain Discussion Group, University of Washington, Seattle, WA, USA

2017 Exploiting Microorganisms for Drug Discovery, Microbial Pathogenesis Seminar series, University of Utah, Salt Lake City, UT

2017 Developing Heterologous Expression Platforms for Elucidating Fungal Natural Product Biosynthesis, Keystone Symposia on Natural Products and Synthetic Biology: Parts and Pathways, Olympic Valley, CA

2016 Fungal Natural Products: Elucidating the Biosynthesis of the Good, the Bad and the Unknown. LS Skaggs Biomedical Research Symposium, Pocatello, ID

2015 Elucidating the Biosynthesis of Fungal Azaphilone Natural Products from Chaetomium globosum. Bioscience Symposium, University of Utah, Salt Lake City, UT

2015 Fungal natural products: understanding the good, the bad and the unknown, Natural Products Affinity Group 10 Year Anniversary Event, San Diego, CA

2008 Aspects in Azamerone Biosynthesis, Formation of the Unprecedented Phthalazinone Core. American Chemical Society Western Regional Meeting, Las Vegas, NV, USA

2008 The Napyradiomycin Biosynthetic Cluster Provides a Powerful Toolbox to Study Unique Halogenating Enzymes. Training Program in Marine Biotechnology Fellowship Retreat, San Diego, CA

**Invited Talks International**

2023 Discovery and Engineering of Natural Products for Human Health, McGill University, Montreal, Canada

2022 Harnessing the Chemical Potential of Unprecedented Microbes from Great Salt Lake, Seoul National University (virtual)

2022 Unlocking the Chemical Potential of the Fungal Terpenome, 3rd Synthetic Biology for Natural Products Conference, Cancun, Mexico

2021 Harnessing the Chemical Potential of Unprecedented Microbes from the Great Salt Lake, II Bio.Natural-Bioactive Natural Products Research Meeting, Western European meeting (virtual)

2021 Unlocking the Chemical Potential of the Fungal Terpenome, 3rd International Conference of Marine Fungal Natural Products, University Cote-d’ Azur, Nice, France (Virtual)

2021 Harnessing the Chemical Potential of Unprecedented Microbes from the Great Salt Lake, Directing Biosynthesis Online, Based in the UK.

2021 Unlocking the Chemical Potential of the Fungal Terpenome, University of Prince Edward Island, Department of Chemistry, Prince Edward Island, Canada (Virtual)

2020 Harnessing the Chemical Potential of Halophiles from the Great Salt Lake, Technical University of Dresden, Dresden, Germany, (Virtual).

2020 Unlocking the Chemical Potential of the Fungal Terpenome, 3rd International Conference of Marine Fungal Natural Products, University Cote-d’ Azur, Nice, France (Canceled due to COVID)

2019 Developing Microorganisms for Drug Discovery, Ruhr-University Bochum, Bochum, Germany

2019 Engineering a Heterologous Expression Platform for Fungal Terpene Biosynthesis, 2nd Synthetic Biology for Natural Products Conference, Puerto Vallarta, Mexico

2018 Developing Heterologous Expression Platforms for Fungal Terpenes, Industrial Synthetic Biology Congress, Munich, Germany

2018 Engineering Heterologous Expression Platforms for Elucidating Fungal Terpene Biosynthesis, Canadian Chemistry Conference, Edmonton, Alberta, Canada

2010 Investigation the Biosynthesis of Halogenated Meroterpenoid Natural Products from Marine Actinomycetes. Society for General Microbiology Meeting, University College Dublin, Dublin, Ireland

**Invited Oral Presentations Selected After Abstract Submission**

2022 Unlocking the Chemical Potential of the Fungal Terpenome, Directing Biosynthesis VI, Edinburgh, Scotland

2020 Decoding Microorganism Communication for Drug Discovery, Directing Biosynthesis VI, Edinburgh, Scotland (Canceled due to COVID)

2018 Exploring the Chemical Potential of Great Salt Lake Microorganisms, American Society of Pharmacognosy, Lexington, KY

2017 Identification of the Mangicol Biosynthetic Gene Cluster in *Fusarium equiseti* CNC-477 and Characterization of its Sesterterpene Synthase, American Society of Pharmacognosy Annual Meeting, Portland, OR

2016 Identification of the Mangicol Biosynthetic Gene Cluster in *Fusarium equiseti* CNC-477 and Characterization of its Sesterterpene Synthase. Society of Industrial Microbiology and Biotechnology, New Orleans, LA

2013 Identifying and Characterizing Fungal Polyketide Synthases Involved in the Biosynthesis of the Chaetoviridin and Chaetomugilin Azaphilones. Society of Industrial Microbiology and Biotechnology Annual Meeting, San Diego, CA

2008 The Napyradiomycin Biosynthetic Cluster Provides a Powerful Toolbox to Study Unique Halogenating Enzymes. Society of Industrial Microbiology and Biotechnology Annual Meeting, San Diego, CA

**TEACHING RESPONSIBILITIES/ASSIGNMENTS**

Fall 2023 PHARM 7355 Integrated Pharmacotherapeutics for 3rd year Pharmacy students, Co-Course Master

PHARM 5139 Foundations in Immunology and Pathology, Co-Course Master

Spring 2023 BLCHM 6300 Facilitator and Capstone examiner for 1st year PhD students

Fall 2022 PHARM 5110 Biochemistry for 1st year Pharmacy students

Spring 2022 PHARM 6253 Integrated Pharmacotherapeutics for 2nd year Pharmacy students, Module Leader

Fall 2021 PHARM 5110 Biochemistry for 1st year Pharmacy students

Spring 2021 PHARM 6253 Integrated Pharmacotherapeutics for 2nd year Pharmacy students, Module Leader

BLCHM 6300 Capstone examiner for 1st year PhD students

PHARM 6251 Recitation for 2nd year Pharmacy students

Fall 2020 PHARM 5110 Biochemistry for 1st year Pharmacy students

Spring 2020 PHARM 6253 Integrated Pharmacotherapeutics for 2nd year Pharmacy students, Module Leader

BLCHM 6300 Capstone examiner for 1st year PhD students

PHARM 6251 Recitation for 2nd year Pharmacy students

Fall 2019 PHARM 5110 Biochemistry for 1st year Pharmacy students

Spring 2019 PHARM 6253 Integrated Pharmacotherapeutics for 2nd year Pharmacy students, Module Leader

BLCHM 6300 Capstone examiner for 1st year PhD students

Fall 2018 PHARM 5110 Biochemistry for 1st year Pharmacy students

BIOL 5425 Mycology for undergraduate and graduate students

Spring 2018 PHARM 6253 Integrated Pharmacotherapeutics for 2nd year Pharmacy students, Module Leader

MDCH 7890 Research Seminar

BLCHM 6300 Capstone examiner for 1st year PhD students

Fall 2017 PHARM 5110 Biochemistry for 1st year Pharmacy students

PHARM 7355 Integrated Pharmacotherapeutics for 3rd year Pharmacy students, Module Leader

BIOL 5425 Mycology for undergraduate and graduate students

MDCH 7890 Research Seminar

Spring 2017 PHARM 6253 Integrated Pharmacotherapeutics for 2nd year Pharmacy students, Module Leader

MDCH 7890 Research Seminar

BLCHM 6300 Capstone examiner for 1st year PhD students

Fall 2016 PHARM 5110 Biochemistry for 1st year Pharmacy students

MDCH 7890 Research Seminar

Spring 2016 MDCH 5220 Medicinal Chemistry for 2nd year Pharmacy students

MDCH 7890 Research Seminar

Fall 2015 MDCH 7890 Research Seminar

Spring 2015 MDCH 5220 Medicinal Chemistry for 2nd year Pharmacy students