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Education

Ph.D. Chemistry and Biochemistry, University of California-San Diego — 2009-2012, La Jolla, CA
Thesis Title: Harnessing Microbial Metabolic Exchange for the Discovery of Biologically Active Molecules
Supervisor: Pieter C. Dorrestein

M.S. Chemistry, University of California-San Diego — 2007-2009, La Jolla, CA
Thesis Title: Mass spectrometric and bioinformatics approaches to characterizing of cyclic non-ribosomal peptides and ribosomally encoded peptide antibiotic.
Supervisor: Pieter C. Dorrestein

B.S. Biological Science and Technology, National Chiao Tung University — 2002-2006, Hsinchu, Taiwan
Research Project: A Novel Conformation-Dependent Monoclonal Antibody Specific to Native Structure of β-lactoglobulin and its Application.
Supervisor: Simon J. T. Mao

Professional Experience

Simons Foundation Fellow of the Life Science Research Foundation — 2013-current
Postdoctoral Fellow, Stanford University — Stanford, CA
Department of Microbiology and Immunology
Project: Metabolic profiling on human microbiome
Advisor: David A. Relman

Funding & Selected Awards

Simons Foundation Fellow, Life Science Research Foundation	2013-2016
Teddy Traylor Research Award, University of California, San Diego	2012
Study Abroad Grant SAS-98116-2-US-108, Ministry of Education, Taiwan.	2010, 2011
Undergraduate Research Grant, National Science Council, Taiwan.	2005, 2006
Full Scholarship for Undergraduate Study, National Chiao Tung University, Taiwan	2002-2006

Teaching Experience

Host Workshop on New Mass Spectrometry Approaches — May, 2012
Hong Kong University of Science &Technology, Hong Kong

Host Workshop on Imaging Mass Spectrometry and Proteomics — May, 2010
China Medical University, Taiwan

Chem143A (Organic Chemistry Laboratory) — 2007-2009
University of California, San Diego

Professional Memberships

American Society of Mass Spectrometry	2011-present
American Society of Pharmacognosy	2010-present

Publications

Representative Papers (*Designates Equal Contribution)

1. **Liu WT**, Lamsa A, Wong WR, Boudreau PD, Kersten R, Peng Y, Moree WJ, Duggan BM, Moore BS, Gerwick WH, Linington RG, Pogliano K, Dorrestein PC. MS/MS-based networking and peptidogenomics guided genome mining revealed the stenothricin gene cluster in Streptomyces roseosporus. ***J Antibiotic.*** [Epub ahead of print] (2013) Special issue contributed to Prof. Christopher T. Walsh's Retirement.
2. **Liu WT**, Kersten RD, Yang YL, Moore BS, Dorrestein PC. Imaging mass spectrometry and genome mining via short sequence tagging identified the anti-infective agent arylomycin in Streptomyces roseosporus. ***J Am Chem Soc.*** 133, 18010-3 (2011).
3. Phelan VV*, **Liu WT***, Pogliano K, Dorrestein PC. Microbial Metabolic Exchange- the chemotype-phenotype link. ***Nat Chem Biol.*** (Perspective). 8, 26-35 (2011)
4. **Liu WT***, Yang YL*, Xu Y*, Lamsa A, Haste NM, Yang JY, Ng J, Gonzalez D, Ellermeier CD, Straight PD, Pevzner PA, Pogliano J, Nizet V, Pogliano K, Dorrestein PC. Imaging mass spectrometry of intraspecies metabolic exchange revealed the cannibalistic factors of Bacillus subtilis. ***Proc Natl Acad Sci U S A.*** 107,16286-90 (2010).

   Featured in "Imaging Reveals Key Metabolic Factors of Cannibalistic Bacteria", Science Daily.

   Featured in "Cannibal bacteria could lead to new antibiotics", Ars Technica.

   Selected by Faculty of 1000 Biology and rated as "Must Read".
5. **Liu WT***, Ng J*, Meluzzi D, Bandeira N, Gutierrez M, Simmons TL, Schultz AW, Linington RG, Moore BS, Gerwick WH, Pevzner PA, Dorrestein PC. Interpretation of tandem mass spectra obtained from cyclic nonribosomal peptides. ***Anal Chem.*** 81, 4200-9 (2009).

Co-Authored Papers

1. Moree WJ, Yang JY, Zhao X, **Liu WT**, Aparicio M, Atencio L, Ballesteros J, Sánchez J, Gavilán RG, Gutiérrez M, Dorrestein PC. Imaging mass spectrometry of a coral microbe interaction with fungi. ***J Chem Ecol.*** 39:1045-54 (2013).
2. Perez Morales TG, Ho TD, **Liu WT**, Dorrestein PC, Ellermeier CD. Production of the Cannibalism Toxin SDP Is a Multistep Process That Requires SdpA and SdpB. ***J Bacteriol.*** 195, 3244-3251 (2013)
3. Boudreau PD, Byrum T, **Liu WT**, Dorrestein PC, Gerwick WH. Viequeamide A, a Cytotoxic Member of the Kulolide Superfamily of Cyclic Depsipeptides from a Marine Button Cyanobacterium. ***J Nat Prod.*** 75:1560-70 (2012).
4. Gonzalez DJ, Xu Y, Yang YL, Esquenazi E, **Liu WT**, Edlund A, Duong T, Du L, Molnár I, Gerwick WH, Jensen PR, Fischbach M, Liaw CC, Straight P, Nizet V, Dorrestein PC. Observing the invisible through imaging mass spectrometry, a window into the metabolic exchange patterns of microbes. ***J Proteomics.*** 75, 5069-76 (2012).
5. Lamsa A, **Liu WT**, Dorrestein PC, Pogliano K. The Bacillus subtilis cannibalism toxin SDP collapses the membrane potential and induces autolysis. ***Molecular Microbiology.*** 84, 486-500 (2012).
6. Mohimani H, **Liu WT**, Mylne JS, Poth AG, Colgrave ML, Tran D, Selsted ME, Dorrestein PC, Pevzner PA. Cycloquest: Identification of Cyclopeptides via database search of their mass spectra against genome database. ***J Proteome Res.*** 10, 4505-12 (2011).
7. Mohimani H, Yang YL, **Liu WT**, Hsieh PW, Dorrestein PC, Pevzner PA. Sequencing cyclic peptides by multistage mass spectrometry. ***Proteomics.*** 11, 3642-50 (2011).

8. Yang YL, Xu Y, Kersten RD, **Liu WT**, Meehan MJ, Moore BS, Bandeira N, Dorrestein PC. Connecting chemotypes and phenotypes of cultured marine microbial assemblages by imaging mass spectrometry. ***Angew Chem Int Ed Engl.*** 50, 5839-42 (2011).

Featured on the journal cover.

Featured in "Tiny Talk On a Barnacle's Back", Science Daily.

9. Grindberg RV, Ishoey T, Brinza D, Esquenazi E, Coates RC, **Liu WT**, Gerwick L, Dorrestein PC, Pevzner P, Lasken R, Gerwick WH. Single cell genome amplification accelerates identification of the apratoxin biosynthetic pathway from a complex microbial assemblage. ***PLoS One.*** 6, e18565 (2011).
10. Udwary DW, Gontang EA, Jones AC, Jones CS, Schultz AW, Winter JM, Yang JY, Beauchemin N, Capson TL, Clark BR, Esquenazi E, Eustáquio AS, Freel K, Gerwick L, Gerwick WH, Gonzalez D, **Liu WT**, Malloy KL, Maloney KN, Nett M, Nunnery JK, Penn K, Prieto-Davo A, Simmons TL, Weitz S, Wilson MC, Tisa LS, Dorrestein PC, Moore BS. Significant natural product biosynthetic potential of actinorhizal symbionts of the genus frankia, as revealed by comparative genomic and proteomic analyses. ***Appl Environ Microbiol.*** 77, 3617-25 (2011).
11. Mevers E, **Liu WT**, Engene N, Mohimani H, Byrum T, Pevzner PA, Dorrestein PC, and Gerwick WH. Cytotoxic Veraguamides, Alkynyl Bromide Containing Cyclic Depsipeptides from the Marine Cyanobacterium cf. Oscillatoria margaritifera. ***J. Nat. Prod.*** 74, 928-36 (2011).
12. Mohimani H, **Liu WT**, Yang YL, Guadencio S, Fenical W, Dorrestein PC, and Pevzner PA. Multiplex de-novo sequencing of peptide antibiotics, ***J Comput Biol.*** 18, 1371-81 (2011).
13. Liu W, Tanasa B, Tyurina OV, Zhou TY, Gassmann R, **Liu WT**, Ohgi KA, Benner C, Garcia-Bassets I, Aggarwal AK, Desai A, Dorrestein PC, Glass CK, Rosenfeld MG. PHF8 mediates histone H4 lysine 20 demethylation events involved in cell cycle progression. ***Nature.*** 466, 508-12 (2010).
14. Leão PN, Pereira AR, **Liu WT**, Ng J, Pevzner PA, Dorrestein PC, König GM, Vasconcelos VM, Gerwick WH. Synergistic allelochemicals from a freshwater cyanobacterium. ***Proc Natl Acad Sci U S A.*** 107, 11183-8 (2010).
15. He C, Nora GP, Schneider EL, Kerr ID, Hansell E, Hirata K, Gonzalez D, Sajid M, Boyd SE, Hruz P, Cobo ER, Le C, **Liu WT**, Eckmann L, Dorrestein PC, Houpt ER, Brinen LS, Craik CS, Roush WR, McKerrow J, Reed SL. A Novel Entamoeba Histolytica Cysteine Proteinase, EHCP4, is Key for Invasive Amebiasis and a Therapeutic Target. ***J Biol Chem.*** 285, 18516-27 (2010).
16. Watrous J, Burns K, **Liu WT**, Patel A, Hook V, Bafna V, Barry CE 3rd, Bark S, Dorrestein PC. Expansion of the mycobacterial "PUPylome". ***Mol Biosyst.*** 6, 376-85 (2010).
17. Hughes CC, Yang YL, **Liu WT**, Dorrestein PC, La Clair JJ, Fenical W. Marinopyrrole A target elucidation by acyl dye transfer. ***J Am Chem Soc.*** 131, 12094-6 (2009).
18. Ng J, Bandeira N, **Liu WT**, Ghassemian M, Simmons TL, Gerwick WH, Linington R, Dorrestein PC, Pevzner PA. Dereplication and de novo sequencing of nonribosomal peptides. ***Nat Methods.*** 6, 596-9 (2009).

Featured in "New Drugs Faster from Natural Compounds", Science Daily.

19. Burns KE, **Liu WT**, Boshoff HI, Dorrestein PC, Barry CE 3rd. Proteasomal protein degradation in Mycobacteria is dependent upon a prokaryotic ubiquitin-like protein. ***J Biol Chem.*** 284, 3069-75 (2009).
20. Chen WL, **Liu WT**, Yang MC, Hwang MT, Tsao JH, Mao SJT. A Novel

Conformation-Dependent Monoclonal Antibody Specific to Native Structure of β-lactoglobulin and its Application. ***J. Dairy Sci.*** 89, 912-921 (2006).

Conference Posters Presentations

1. **Liu WT**, Bandeira N, Dorrestein PC. Harnessing Microbial Metabolic Exchange for the Discovery of Biologically Active Molecules. *Gordon Research Conference – Marine Natural Products.* **February 2012.** Ventura.
2. **Liu WT**, Kersten RD, Yang YL, Pevzner PA, Moore BS, Dorrestein PC. Mass spectrometry based structural characterization of peptidic natural products (PNPs). *52nd Annual meeting of America society of Pharmacognosy*. **July 2011.** San Diego.
3. **Liu WT**, Kersten RD, Yang YL, Pevzner PA, Moore BS, Dorrestein PC. Mass spectrometry based structural characterization of peptidic natural products (PNPs). *Gordon Research Conference - High Throughput Chemistry and Chemical Biology.* **June 2011.** New London.
4. **Liu WT**, Mohimani H, Pevzner PA, Dorrestein PC. Mass spectrometry based structural characterization of peptidic natural products (PNPs). *ASMS Conference on Mass Spectrometry and Allied Topics.* **June 2011**. Denver.
5. **Liu WT**, Yang YL, Xu Y, Lamsa A, Yang JY, Ng J, Straight PD, Pevzner PA, Pogliano J, Pogliano K, Dorrestein PC. Metabolic profiling using imaging mass spectrometry identifies new cyclic natural products from *Bacillus subtilis*. *51st Annual meeting of America society of Pharmacognosy*. **July 2010**. Florida.
6. **Liu, WT**, Ng, J, Meluzzi, D, Bandeira, N, Gutierrez, M, Simmons, TL, Schultz AW, Linington, R G, Moore, BS, Gerwick, WH, Pevzner, PA, Dorrestein, PC. The Interpretation and Annotation of Tandem Mass Spectrometry Data Obtained from Non-ribosomal Derived Cyclic Peptides. *The 2008 BIO International Convention.* **June 2009**. San Diego.

Oral Presentations

1. Harnessing Microbial Metabolic Exchange for the Discovery of Biologically Active Molecules. *UCSD Pharmacology Research Discussion.* June 8, 2012.
2. Linking phenotypes, chemotypes with genotypes through imaging mass spectrometry and short sequence tagging (SST). *NPAG meeting*. San Diego. May 13, 2011.
3. Therapeutic lead discovery via identification of the *B. subtilis* cannibalism factors. *NPAG meeting*. San Diego. Aug 13, 2010.