**Terence S. Crofts, Ph.D.**
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Chemistry of Life Processes Institute, Room 3737, Evanston, IL 60208

## EDUCATION AND EMPLOYMENT

| | |
|---|---|
| 2022 – | **Assistant Professor, Florida State University**<br>Department of Biomedical Sciences |
| 2018 – 2022 | **Research Assistant Professor, Northwestern University**<br>Department of Molecular Biosciences |
| 2014 – 2018 | **Postdoctoral Scholar, Washington University in St. Louis**<br>Department of Pathology and Immunology<br>Advisor: Gautam Dantas<br>Project: Mechanisms of chemotherapeutic bioconversion by environmental and human commensal bacteria |
| 2008 - 2013 | **PhD, University of California Berkeley**<br>Department of Plant and Microbial Biology<br>Microbiology Program<br>Advisor: Michiko E. Taga<br>Committee: M.E. Taga, K. Niyogi, M. Chang, P.C. Zambryski<br>Thesis: Genetic and Biochemical Origins of Diversity in Cobamides: Nature's Most Beautiful Cofactors. |
| 2004 - 2008 | **BS, University of Illinois at Urbana-Champaign**<br>Molecular and Cellular Biology; High Distinction<br>Advisor: David M. Kranz<br>Thesis: Characterization of specificity and activity of mutated T cell receptor – pepMHC interactions<br>Chemistry |

## AWARDS & HONORS

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|---|---|
| FELLOWSHIPS | |
| NIH/NIDDK T32 Postdoctoral Training Grant | 2017-2018 |
| NIH/NCIHD T32 Postdoctoral Training Grant | 2014-2016 |
| William T. & Helen S. Halstead Scholarship | 2009-2010 |
| NSF Graduate Research Fellowship Honorable Mention | 2009 |
| AWARDS | |
| Lake Arrowhead Microbial Genomics Conference 2nd place poster | 2016 |
| American Society for Microbiology Student Travel Grant | 2010 |
| Annual Microbiology Student Symposium 1st place poster | 2010 |
| Plant and Microbial Biology Dept. Retreat 2nd place poster | 2009 |
| Dept. of Molecular and Cellular Biology Best Senior Thesis | 2008 |
| Graduation with High Distinction (Molecular and Cellular Biology) | 2008 |
| Graduation with James Scholar Honors | 2008 |
| Dept. of Molecular and Cellular Biology Open House 1st place poster | 2007 |

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| James Scholar Research Scholarship | 2007 |
| Edmund James Scholar | 2004-2008 |
| Dean's List | 2005-2008 |
| Merit Recognition Scholarship Program | 2004 |

## PUBLICATIONS

†Corresponding (or shared corresponding) author position
*Authors contributed equally to these works

1. Mullowney MW, Maltseva NI, Kim Y, Endres M, Joachimiak A, Crofts TS† (2022) Functional characterization of chloramphenicol reductases from human pathogens. **Microbiology Spectrum**, 10 (2): e00139-22.

2. Crofts TS†, McFarland AG, Hartmann EM (2021) Mosaic Ends Tagmentation (METa) assembly for highly efficient construction of functional metagenomic libraries. **mSystems**, 6 (3): e00524-21.

3. Schwartz D, Wardenburg K, Shalon N, Ning J, Crofts TS, D'Souza A, Robinson J, Henderson J, Warner B, Tarr P, Dantas G (2021) Microbiome and immune disruption accompany mouse death in a gnotobiotic mouse model of neonatal sepsis. **Journal of the Pediatric Infectious Diseases Society**, 10 (Supplement 2): S6-S7.

4. Schwartz D, D'Souza A, Crofts TS, Ning J, Shalon N, Robinson J, Henderson J, Warner B, Tarr P, Dantas G (2021) Death is antibiotic-microbiota dependent in a humanized mouse model of late-onset neonatal sepsis. **Journal of the Pediatric Infectious Diseases Society**, 10 (Supplement 1): S5-S6.

5. Crofts TS†, Sontha P, King AO, Wang B, Biddy B, Zanolli N, Gaumnitz J, Dantas G† (2019) Discovery and characterization of a nitroreductase capable of conferring bacterial resistance to chloramphenicol. **Cell Chemical Biology**, 26 (4): 559-70.

6. Crofts TS, Wang B, Spivak A, Gianoulis TA, Forsberg KJ, Gibson MK, Johnsky LA, Broomall SM, Rosenzweig CN, Skowronski EW, Gibbons HS, Sommer MOA, Dantas G (2018) Shared strategies for β-lactam catabolism in the soil microbiome. **Nature Chemical Biology**, 14 (6). 556-64.

   a. Crofts, Terence S. "Bacteria may be powerful weapon against antibiotic resistance." The Conversation, May 2nd, 2018, theconversation.com/bacteria-may-be-powerful-weapon-against-antibiotic-resistance-95750.

7. Keen EC*, Crofts TS*, Dantas G (2018) Checkpoint checkmate: Microbiota modulation of cancer immunotherapy. **Clinical Chemistry**, 64 (9). 1280-3.

8. Crofts TS, Wang B, Spivak A, Gianoulis TA, Forsberg KJ, Gibson MK, Johnsky LA, Broomall SM, Rosenzweig CN, Skowronski EW, Gibbons HS, Sommer MOA, Dantas G (2017) Draft genome sequences of three β-lactam-catabolizing soil Proteobacteria. **Genome Announcements**, 5 (32). 8-10.

9. Crofts TS*, Gasparrini AJ*, Dantas G (2017) Next-generation approaches to understand and combat the antibiotic resistome. **Nature Reviews Microbiology**, 15 (7), 422-34.

10. Gasparrini AJ*, Crofts TS*, Gibson MK, Tarr PI, Warner BB, Dantas G (2016) Antibiotic perturbation of the preterm infant gut microbiome and resistome. **Gut Microbes**, 7 (5), 443-9.

11. Gibson MK*, Crofts TS*, Dantas G (2015) Antibiotics and the developing infant gut microbiota and resistome. **Current Opinion in Microbiology**, 27, 51-6.

12. Crofts TS*, Hazra AB*, Tran JLA, Sokolovskaya O, Osadchiy V, Ad O, Pelton J, Bauer S, Taga ME (2014) Regiospecific formation of cobamide isomers is directed by CobT. **Biochemistry**, 53 (49), 7805-15.

13. Crofts TS, Men Y, Alvarez-Cohen L, Taga ME (2014) A bioassay for the detection of benzimidazoles reveals their presence in a range of environmental samples. **Frontiers in Microbiology**. 5:592.

14. Men Y, Seth EC, Yi S, Crofts TS, Allen RH, Taga ME, Alvarez-Cohen L (2014) Identification of specific corrinoids reveals corrinoid modifications in dechlorinating microbial communities. **Environmental Microbiology**, 17 (12), 4873-84.

15. Crofts TS, Seth EC, Hazra AB, Taga ME (2013) Cobamide structure depends on both lower ligand availability and CobT substrate specificity. **Chemistry and Biology**, 20 (10), 1265-74.

16. Hazra AB, Tran JLA, Crofts TS, Taga ME (2013) Analysis of substrate specificity in CobT homologs reveals widespread preference for 5,6-dimethylbenzimidazole, the lower axial ligand of vitamin B12. **Chemistry and Biology**, 20 (10), 1275-85.

17. Bowerman NA, Crofts TS, Chlewicki L, Do P, Baker BM, Garcia KC, Kranz DM (2009). Engineering the binding properties of the T cell receptor:peptide:MHC ternary complex that governs T cell activity. **Molecular Immunology**, 46 (15), 3000-8.

## PRESENTATIONS

INVITED SEMINARS

Crofts, TS "Outside the box bacterial-antimicrobial interactions." **University of Minnesota**, Minneapolis, MN. September, 2021.

Crofts, TS "Discovery and characterization of emerging contaminant-microbiome interactions." **University of Illinois**, Urbana, IL [remote]. June, 2021.

Crofts, TS "Outside the box antimicrobial-bacteria interactions." **Florida State University College of Medicine**, Tallahassee, FL [remote]. February, 2021.

Crofts, TS "Microbiomes and emerging contaminants." **Carnegie Mellon University**, Pittsburgh, PA. February, 2020.

Crofts, TS "Microbiomes and emerging contaminants." **University of Illinois**, Urbana, IL. February, 2020.

Crofts, TS "Microbiomes and emerging contaminants." **Arizona State University**, Tempe, AZ. February, 2020.

Crofts, TS "Microbiomes and emerging contaminants." **Loyola University Stritch School of Medicine**, Maywood, IL. November, 2019.

Crofts, TS "Mechanisms of bacterial penicillin catabolism." **Rocky Mountain Laboratories**, Hamilton, MT. June, 2019.

Crofts, TS "Small molecule degradation, modification, and synthesis in microbiomes." **University of Illinois at Chicago**, Chicago, IL. December, 2018.

Crofts, TS "Mechanisms of antimicrobial bioconversion by environmental and host-associated bacteria." **Lake Arrowhead Microbial Genomics 2018**. Lake Arrowhead, CA. September, 2018.

Crofts, TS "Mechanisms of antimicrobial bioconversion by environmental and host-associated bacteria." **Microbiology and Immunology 2018**. LabRoots. September, 2018. URL: https://bit.ly/3unK527

Crofts, TS "Functional metagenomic discovery and characterization of novel antimicrobial resistance mechanisms." **Gordon Research Conference on Multi-Drug Efflux Systems**, Galveston, TX. March, 2017.

Crofts, TS "The double-edged sword of microbiome diversity: Small molecule synthesis and degradation." **University of Oregon**, Eugene, OR. February, 2017.

Crofts, TS "Development of a murine gut microbiota model for early and repeated antibiotic exposure in early infancy." Women's Health Research Seminar Series, **Barnes Jewish Hospital Institute of Health**, St. Louis, MO. October, 2015.

ORAL PRESENTATIONS

Crofts, TS "Outside the box antimicrobial-bacteria interactions." **MicroSeminar Series**. February, 2021. URL: https://bit.ly/3s7XVDE.

Crofts TS, Wang B, Spivak A, TA Gianoulis, Gibbons HS, Gibson MK, Forsberg KJ, Dantas G "Soil amidases allow catabolism of β-lactam antibiotics by environmental bacteria." **Gordon Research Conference on Drug Resistance**, University of New England, Biddeford, ME. June, 2016.

Crofts, TS "Genetic and Biochemical Origins of Diversity in Cobamides: Nature's Most Beautiful Cofactor" **University of California, Berkeley**, Department of Plant and Microbial Biology, Berkeley, CA. March, 2014.

Crofts TS "Bacterial perfectionists - How corrinoid producers specify the lower ligand." **West Coast Bacterial Physiologists Annual Conference**, Asilomar, CA. December, 2011.

POSTER PRESENTATIONS

Crofts TS, McFarland AG, Hartmann EM "Mosaic Ends Tagmentation (METa) Assembly" **American Society for Microbiology World Microbe Forum**, *virtual*, June, 2021.

Crofts TS "New Functionally Validated Chloramphenicol Reductases from *Haemophilus* and *Neisseria* spp." **ASM Microbe 2020**. *Conference cancelled.*

Crofts TS, Wang B, Spivak A, Gianoulis TA, Forsberg KJ, Gibson MK, Johnsky LA, Broomall SM, Rosenzweig CN, Skowronski EW, Gibbons HS, Sommer MOA, Dantas G "Antibiotic eaters: Functional characterization of a penicillin catabolic pathway in soil bacteria." **Gordon Research Conference on Enzymes, Coenzymes, and Metabolic Pathways**. Waterville Valley, NH. July, 2018.

Schwartz DJ, Crofts TS, Robinson J, Henderson JP, Warner BB, Tarr PI, Dantas G "Gnotobiotic mouse model of infection susceptibility in the neonatal intensive care unit." **American Society for Microbiology**, San Francisco, CA. June, 2019.

Crofts TS, Sontha P, King AO, Wang B, Dantas G "Chloramphenicol reductase: A novel resistance mechanism linking aplastic anemia and chloramphenicol." **Global Health and Infectious disease conference**, St. Louis, MO. April 2018.

Crofts TS, Wang B, Spivak A, TA Gianoulis, Gibbons HS, Gibson MK, Forsberg KJ, Dantas G "Soil amidases allow catabolism of β-lactam antibiotics by environmental bacteria." **Lake Arrowhead Microbial Genomics**, Lake Arrowhead, CA. August, 2016.

Crofts TS, Hazra AB, Tran JLA, Seth EC, Taga ME "The molecular basis of specificity in the biosynthesis of Vitamin $B_{12}$ and its analogs." **Gordon Research Conference on Enzymes, Coenzymes, and Metabolic Pathways**, Waterville Valley, NH. July, 2013.

Hazra AB, Crofts TS, Tran JLA, Taga ME "A tale of two isomers: Exploring the molecular basis of lower ligand attachment in cobamides." **Gordon Research Conference on Enzymes, Coenzymes, and Metabolic Pathways**, Waterville Valley, NH. July, 2013.

Crofts TS, Hazra AB, Tran JLA, Seth EC, Taga ME "The molecular basis of specificity in the biosynthesis of Vitamin $B_{12}$ and its analogs." **American Society for Microbiology 112th General Meeting**, San Francisco, CA. June, 2012.

Crofts TS, Taga ME "Corrinoid lower ligand specificity in the legume symbiont *Sinorhizobium meliloti*." **American Society for Microbiology Conference on Beneficial Microbes**, Miami, FL. October, 2010.

## TEACHING EXPERIENCE

**Discussion Leader**, June 2014
Washington University in St. Louis, Summer Undergraduate Research Fellowship Program
Ethical and Responsible Conduct in Science and Scholarship Seminar

**Graduate Student Instructor**, spring 2011
University of California, Berkeley, Department of Plant and Microbial Biology
PMB 13: Genetic Revolutions

**Graduate Student Instructor**, spring 2010
University of California, Berkeley, Department of Plant and Microbial Biology
PMB C112L: Microbiology Laboratory

## GRANTS, FUNDING, AND PATENTS

AWARDED

NIH Phase I SBIR
Rapid discovery of thousands of intact biosynthetic gene pathways for bioactive natural product compounds from un-sequenced filamentous fungi sing a novel FAC-NGS tool
Role: Co-PD/PI
Direct award: $676,933

Total award: $1,000,000

PENDING SUPPORT

NIH NIGMS R01
Mosaic Ends Tagmentation Assembly: A high efficiency method for functional metagenomic library preparation
Role: PI
Total requested: $2,177,875

NIH Phase I SBIR
Organizing Fungal Strains into a Library of Natural Products and Their Biosynthetic Gene Clusters
Role: Co-PD/PI
Total requested: $75,949

NIH NHLBI R01
Characterization of chloramphenicol oxidoreductase enzymes from the human gut microbiome and testing their role in chloramphenicol-induced aplastic anemia
Role: PI
Total requested: $3,073,657

Major authorship contributions to 12 full-research grants submitted to:
- National Institutes of Health (total funded, $2.3 million)
- Center for Disease Control and Prevention (total funded, $988,000)
- National Science Foundation
- Department of Defense
- March of Dimes Foundation
- Bill and Melinda Gates Foundation

NIH/NIDDK T32 Postdoctoral Training Grant 2017-2018
NIH/NCIHD T32 Postdoctoral Training Grant 2014-2016

PATENTS
Provisional application 63/062,639: Mosaic ends tagmentation assembly

## MENTORSHIP

**Mentor for Undergraduate Students**

UC Berkeley

| | | | |
|---|---|---|---|
| Vadim Osadchiy | 2013 - 2014 | Andrea R. Oneto | 2011 - 2012 |
| Jasmine Aimua | 2012 - 2013 | Marielle Bolano | 2010 |
| Shelley Shi | 2012 – 2013 | Judi Abegania | 2010 |

Washington University

| | | | |
|---|---|---|---|
| Pratyush Sontha | 2017 - 2018 | Amber O. King | 2015 – 2017 |
| Nicole Zanolli | 2016 - 2017 | Jae Lee | 2014 |
| John Gaumnitz | 2016 | | |

**Mentor for Graduate Students**

UC Berkeley

| | |
|---|---|
| Omer Ad | Chemical Biology Graduate Program, fall 2012 |
| Washington University | |
| Brent A. Biddy | Molecular Genetics and Genomics Program, spring 2015 |
| Drew J. Gasparrini | Molecular Genetics and Genomics Program, fall 2014 |

## REFERENCES

**Prof. Gautam Dantas, PhD**
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847-467-4362

**Prof. Michiko E. Taga, PhD**
*PhD Supervisor*
University of California, Berkeley
Koshland Hall, Room 351
Berkeley, CA 94720
taga@berkeley.edu
510-642-6391

**Prof. Phillip I. Tarr, MD**
*Postdoctoral Co-mentor*
Washington University in St. Louis
McDonnell Pediatric Research Building, Rm 6105
St. Louis, MO 63110
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314-286-2848