

Terence S. Crofts, Ph.D.

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ACADEMIC APPOINTMENTS

- 2022 - present **Florida State University**
Assistant Professor of Biomedical Sciences
- 2018 - 2022 **Northwestern University**
Research Assistant Professor of Molecular Biosciences
Chemistry of Life Processes Institute

EDUCATION

- 2014 - 2018 **Washington University in St. Louis**
Postdoctoral Scholar, Department of Pathology and Immunology
Advisor: Gautam Dantas
Mechanisms of chemotherapeutic bioconversion by environmental and human commensal bacteria
- 2008 - 2013 **University of California Berkeley**
Ph.D., Department of Plant and Microbial Biology
Microbiology Program
Advisor: Michiko E. Taga
Thesis: *Genetic and Biochemical Origins of Diversity in Cobamides: Nature's Most Beautiful Cofactors*
- 2004 - 2008 **University of Illinois at Urbana-Champaign**
B.S., Molecular and Cellular Biology - High Distinction
B.S., Chemistry
Advisor: David M. Kranz
Thesis: *Characterization of specificity and activity of mutated T cell receptor – pepMHC interactions*

AWARDS AND HONORS

- 2023 FSU First Year Assistant Professor Award
2023 FSU Undergraduate Research Opportunity Program Grant
2017 - 2018 NIH/NIDDK T32 Postdoctoral Training Grant
2016 Lake Arrowhead Microbial Genomics Conference 2nd place poster
2014 - 2016 NIH/NCIHD T32 Postdoctoral Training Grant
2010 American Society for Microbiology Student Travel Grant

2010	Annual Microbiology Student Symposium 1 st place poster
2009 - 2010	University of California, Berkeley William T. & Helen S. Halstead Scholarship
2009	NSF Graduate Research Fellowship Honorable Mention
2009	Plant and Microbial Biology Dept. Retreat 2 nd place poster
2008	University of Illinois Department of Molecular and Cellular Biology Best Senior Thesis
2008	University of Illinois Graduation with High Distinction
2008	University of Illinois Graduation with James Scholar Honors
2004 - 2008	University of Illinois Edmund James Scholar
2005 - 2008	University of Illinois Dean's List
2007	Department of Molecular and Cellular Biology Open House 1 st place poster
2007	University of Illinois James Scholar Research Scholarship
2004	University of Illinois Merit Recognition Scholarship Program

GRANTS AND FELLOWSHIPS

Active

Pending

2023	<p>NIH/NIGMS R01 Role: PI <i>New techniques for highly efficient preparation of large, multiplexed functional metagenomic libraries</i> Total requested: \$2,200,353</p>
2023	<p>NIH/NIGMS R01 Role: PI <i>Predicting and quantifying the role of the gut microbiome in nitro-pharmaceutical toxicity</i> Total requested: \$2,573,817</p>

Completed

2023	<p>Florida State First Year Assistant Professor Grant Role: PI <i>Linking bacterial genes to pharmaceutical metabolism in the gut microbiome</i> Award: \$20,000</p> <p>Florida State Undergraduate Research Opportunity Program Grant Role: PI Award: \$1,000</p>
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- 2021 - 2023 **NIH/NIAID R44**
Role: Co-I (PI: Jin Woo Bok, Co-I: Charles Chengchang Wu)
Rapid discovery of thousands of intact biosynthetic gene pathways for bioactive natural product compounds from un-sequenced filamentous fungi using a novel FAC-NGS tool
Award: \$1,000,000
- 2017 - 2018 **NIH/NIDDK T32 Postdoctoral Training Grant**
Role: Trainee (Sponsor: Phillip I. Tarr)
- 2014 - 2016 **NIH/NCIHD T32 Postdoctoral Training Grant**
Role: Trainee (Sponsor: Kelle H. Moley)

PUBLICATIONS

†Corresponding (or shared corresponding) author position

*Authors contributed equally to these works

Published

- 2022 **[17]** Mallowney 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.
- 2021 **[16]** **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.
- [15]** 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. [Conference Proceeding]
- [14]** 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. [Conference Proceeding]
- 2019 **[13]** **Crofts TS**[†], Sontha P, King AO, Wang B, Bidy 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.

- 2018
- [12] 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.
- **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.
- [11] Keen EC***, **Crofts TS***, Dantas G (2018) Checkpoint checkmate: Microbiota modulation of cancer immunotherapy. *Clinical Chemistry*, 64 (9). 1280-3.
- 2017
- [10] 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.
- 2016
- [8] 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.
- 2015
- [7] Gibson MK***, **Crofts TS***, Dantas G (2015) Antibiotics and the developing infant gut microbiota and resistome. *Current Opinion in Microbiology*, 27, 51-6.
- 2014
- [6] 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.
- [5] 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.
- [4] 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.

2013 **[3] 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.

[2] 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.

2009 **[1]** 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.

Pre-publication

In preparation

Franck E and **Crofts TS**⁺. History of the streptothricin antibiotics and evidence for the neglect of the streptothricin resistome. *Under review*

Shuai W*, Franck E*, Liechty E, Van Bonn B, Hayden M, Hartmann E*, **Crofts TS**⁺. Discovery of hundreds of chlorhexidine efflux pumps from diverse environments enabled by Barcode tagmentation (BarTa) functional metagenomic libraries. *In prep*

INVITED TALKS

2021 **University of Minnesota**, Minneapolis, MN, September, 2021
Seminar
Outside the box bacterial-antimicrobial interactions

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

Florida State University, Tallahassee, FL [remote]. February, 2021
Seminar
Outside the box antimicrobial-bacteria interactions

2020 **Carnegie Mellon University**, Pittsburgh, PA. February, 2020
Seminar
Microbiomes and emerging contaminants

University of Illinois, Urbana, IL. February, 2020

Seminar
Microbiomes and emerging contaminants

Arizona State University, Tempe, AZ. February, 2020.

Seminar
Microbiomes and emerging contaminants

2019 **Loyola University**, Maywood, IL. November, 2019

Seminar
Microbiomes and emerging contaminants

Rocky Mountain Laboratories, Hamilton, MT. June, 2019

NIAID Meeting: The Bacterial Cell Envelope
Mechanisms of bacterial penicillin catabolism

2018 **University of Illinois at Chicago**, Chicago, IL. December, 2018

Seminar
Small molecule degradation, modification, and synthesis in microbiomes

Lake Arrowhead Microbial Genomics 2018, Lake Arrowhead, CA.

September, 2018

Conference
Mechanisms of antimicrobial bioconversion by environmental and host-associated bacteria

Microbiology and Immunology 2018, LabRoots. September, 2018.

Conference
Mechanisms of antimicrobial bioconversion by environmental and host-associated bacteria
URL: <https://bit.ly/3unK527>

2017 **Gordon Research Conference on Multi-Drug Efflux Systems**,

Galveston, TX. March, 2017

Conference
Functional metagenomic discovery and characterization of novel antimicrobial resistance mechanisms

University of Oregon, Eugene, OR. February, 2017

Seminar
The double-edged sword of microbiome diversity: Small molecule synthesis and degradation

2015 **Barnes Jewish Hospital Institute of Health**, St. Louis, MO. October, 2015

Women's Health Research Seminar Series
Development of a murine gut microbiota model for early and repeated antibiotic exposure in early infancy

CONFERENCE PROCEEDINGS**Talks**

- 2022 Crofts, TS. "Discovery of new streptothricin resistance mechanisms from the soil microbiome enabled by deep functional metagenomics." **Florida American Society for Microbiology Meeting**, Orlando, Fl. October, 2022.
- 2021 Crofts, TS "Outside the box antimicrobial-bacteria interactions." **MicroSeminar Series**. February, 2021. URL: <https://bit.ly/3s7XVDE>.
- 2016 Crofts TS "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.
- 2014 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.
- 2011 Crofts TS "Bacterial perfectionists - How corrinoid producers specify the lower ligand." **West Coast Bacterial Physiologists Annual Conference**, Asilomar, CA. December, 2011.

Conference posters

- 2023 Franck E, Bernate E, Vizoso S, Maltseva N, Endres M, Kim Y, Joachimiak A, **Crofts TS** "Chloramphenicol nitroreductase genes from the human gut microbiome" **American Society for Microbiology Annual Meeting**. Houston, TX. June, 2023
- 2022 **Crofts TS**, McFarland AG, Hartmann EM "Deep functional metagenomic selection of a soil microbiome to unearth the streptothricin resistome" **American Society for Microbiology South Eastern Branch Meeting**. Savannah, GA. November, 2022.
- 2021 **Crofts TS**, McFarland AG, Hartmann EM "Mosaic Ends Tagmentation (METa) Assembly" **American Society for Microbiology World Microbe Forum**, virtual, June, 2021.
- 2020 **Crofts TS** "New Functionally Validated Chloramphenicol Reductases from *Haemophilus* and *Neisseria* spp." **ASM Microbe 2020**. Conference cancelled.
- 2018 **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.

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.

2016 **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.

2013 **Crofts TS**, Hazra AB, Tran JLA, Seth EC, Taga ME "The molecular basis of specificity in the biosynthesis of Vitamin B₁₂ 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.

2012 **Crofts TS**, Hazra AB, Tran JLA, Seth EC, Taga ME "The molecular basis of specificity in the biosynthesis of Vitamin B₁₂ and its analogs." **American Society for Microbiology 112th General Meeting**, San Francisco, CA. June, 2012.

2010 **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

Instructor

2023	BMS 6041: Host defense	FSU
	Introduction to Biomedical Research	FSU
2022	BMS 6041: Host defense	FSU

Graduate instructor

2011	PMB 13: Genetic Revolutions	UC Berkeley
2010	PMB C112L: Microbiology Laboratory	UC Berkeley

Guest lectures

2014	Undergraduate Research Fellowship Program	WashU
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MENTORING

Graduate students

2023	Nikita Zalenksi	FSU
2023	Sediqua Bufford	FSU
2015	Brent A. Biddy	WashU
2014	Drew J. Gasparini	WashU
2012	Omer Ad	UC Berkeley

Medical students

2023	Naila Hussein	FSU
2023	Jane Hufnagel	FSU

Research assistants

2023 - present	Hayden Allman	FSU
2022 - present	Ezabelle Franck	FSU

Undergraduate students

2022 - present	Elizabeth Bernate	FSU
2022 - present	Sophia Vizoso	FSU
2017 - 2018	Pratyush Sontha	WashU
2016 - 2017	Nicole Zanolli	WashU
2016	John Gaumnitz	WashU
2015 - 2017	Amber O. King	WashU
2014	Jae Lee	WashU
2013 - 2014	Vadim Osadchiy	UC Berkeley
2012 - 2013	Shelley Shi	UC Berkeley
2012 - 2013	Jasmine Aimua	UC Berkeley
2011 - 2012	Andrea R. Oneto	UC Berkeley
2010	Marielle Bolano	UC Berkeley
2010	Judi Abegania	UC Berkeley

EDITORIAL SERVICE AND REVIEW

Ad hoc review

Nature Communications, ISME Communications, PLoS ONE, Communications Biology, Environmental Science and technology, Clinical and Translational Medicine, Frontiers in Microbiology

PROFESSIONAL AND PUBLIC SERVICE

Professional affiliations

American Society for Microbiology – National branch

American Society for Microbiology – Southeastern United States branch
American Society for Microbiology – Florida branch

Departmental and university service

2023 - present M.D. Student Advisor (FSU)
2022 - present Ph.D. Committee member – Alana Chang (FSU)
2022 - present Undergraduate Research Opportunity Mentor (FSU)
2021 - 2022 MS Thesis Committee member – Chenzing Qian (NU)

Public outreach

2015 - 2016 AP Biology High School Lab visit (WashU, presenter x2)
2005 - 2007 Kids & Chemistry Outreach Program (UIUC, presenter x2, leader x1)