

Terence S. Crofts, Ph.D.

tcrofts@illinois.edu • croftsmicrolab.org
1207 W. Gregory St., Office 430, Urbana, IL 61801

ACADEMIC APPOINTMENTS

- 2024 – Present **University of Illinois at Urbana-Champaign**
Assistant Professor of Animal Sciences
Affiliate Institute for Genomic Biology
Affiliate Division of Nutritional Sciences
- 2022 - 2024 **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

- 2024 American Society for Microbiology Peggy Cotter Travel Award

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 2 nd 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

Pending

2025	NIH/NIGMS R01 Role: PI <i>Characterizing microbial chemotherapeutic resistomes in gut and soil microbiomes</i> Total requested: \$2,119,476
2025	NIH/NIGMS R01 Role: PI <i>Next-generation methods for preparing functional metagenomic libraries</i> Total requested: \$2,044,507

Completed

2024	Florida State Undergraduate Research Opportunity Program Grant Role: PI Award: \$1,213
2023	Florida State First Year Assistant Professor Grant Role: PI

Linking bacterial genes to pharmaceutical metabolism in the gut microbiome

Award: \$20,000

Florida State Undergraduate Research Opportunity Program Grant

Role: PI

Award: \$1,000

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

2024

[18] Franck E and **Crofts TS⁺** (2024) History of the streptothricin antibiotics and evidence for the neglect of the streptothricin resistome. *npj Antimicrobials and Resistance*, 2(3).

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, 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.
- 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***, Gasparri AJ*, Dantas G (2017) Next-generation approaches to understand and combat the antibiotic resistome. *Nature Reviews Microbiology*, 15 (7), 422-34.
- 2016 [8] Gasparri 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

Allman H, Bernate E, Frank E, **Crofts TS⁺**. Functional metagenomic discovery of novel tetracycline and acarbose resistance genes from low biomass samples using METa assembly. *bioRxiv*, 10.1101/2024.06.29.601325

In preparation

Bernate E, Franck E, **Crofts TS⁺**. Mobilized *Acinetobacter eptA* genes from the goose gut microbiome can confer colistin resistance in *E. coli*. *In preparation*

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 preparation*

INVITED TALKS

2024

University of Rochester, Rochester, NY. March 2024
Seminar

Functional metagenomic mining of microbiome-emerging contaminant interactions

University of Illinois, Urbana, IL. March 2024

Seminar

Functional metagenomic mining of microbiome-emerging contaminant interactions

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

2025

Crofts, TS "Functional metagenomic mining of microbiome-emerging contaminant interactions." **Division of Nutritional**

Sciences, University of Illinois Seminar Series

Urbana, IL. April, 2025

2023

Crofts, TS "Functional metagenomic discovery of novel chlorhexidine efflux pumps from across environments."

Southeastern Branch American Society for Microbiology Meeting,

Auburn, AL. November, 2023.

2023

Crofts, TS "Functional metagenomic discovery of novel chlorhexidine efflux pumps from across environments."

Florida American Society for Microbiology Meeting, St. Augustine, Fl.

October, 2023.

- 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

- 2025 Allman HM, Bernate EP, Franck E, Oliaro FJ, Hartmann EM, **Crofts TS** "Functional metagenomic discovery of novel antibiotic resistance genes from low biomass samples using METa assembly" **Midwest Microbiome Symposium**. Columbus, OH. May 2025
- 2024 Bernate E, Franck E, Allman A, Vizoso S, **Crofts TS** "Transmissible colistin resistance in the goose fecal microbiome" **ASM Microbe 2024**. Atlanta, GA. June 2024
- Crofts TS**, Shuai W, Franck E, Allman H, Hartmann E "Multiplexing of functional metagenomic libraries using Barcoded Tagmentation (BarTa) assembly" **ASM Microbe 2024**. Atlanta, GA. June 2024
- Shuai W, Franck E, McFarland A, Shen J, Hartmann E, **Crofts TS** "Identifying antimicrobial resistant genes from environmental microbiomes with multiplexed functional metagenomics" **ASM Microbe 2024**. Atlanta, GA. June 2024
- 2023 Zalenski N, Bufford S, **Crofts TS** "Microbiome resistance to chemotherapeutics" **First Year Assistant Professor Workshop**. Tallahassee, FL. September, 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.
- 2019 **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: Mechanics of penicillin catabolism in soil originating Proteobacteria." **Keystone Symposia Conference, Microbiome: Chemical Mechanisms and Biological Consequences**. Montral, Quebec, Canada. March, 2019
- 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

2024	BMS 5525: Bioregulation	FSU	
	PAS 5072: Clinical Pharmacology II	FSU	
2023	GMS 5303: Molec mech of common human disease	FSU	
	BMS 6041: Host defense	FSU	
	BMS 5183: 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 rotation	Nikita Zalenksi	FSU
2023 rotation	Sediqua Bufford	FSU
2015	Brent A. Biddy	WashU
2014	Drew J. Gasparrini	WashU
2012	Omer Ad	UC Berkeley

Medical students

2023 – 2024	Naila Hussein	FSU
2023 – 2024	Jane Hufnagel	FSU

Research assistants

2024 – 2024	Elizabeth Bernate	FSU
2023 – 2024	Hayden Allman	FSU
2022 – 2024	Ezabelle Franck	FSU

Undergraduate students

2023 – 2024	Celine Yacoub	FSU
2023 – 2024	Maryanne Armstrong	FSU
2022 – 2024	Sophia Vizoso	FSU
2022 – 2024	Elizabeth Bernate	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, Cell Host and Microbe, ISME Communications, PLoS ONE, Communications Biology, ASM Spectrum, 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 – Illinois branch

Departmental and university service

2023 – 2024	Chair, Seminar Committee (FSU)
2022 – 2024	Ph.D. Committee member – Nikita Zalenski (FSU)
2023 – 2024	M.D. Student Advisor (FSU) – Naila Hussein (FSU)
2023 – 2024	M.D. Student Advisor (FSU) – Jane Hufnagel (FSU)
2022 – 2024	Ph.D. Committee member – Alana Chang (FSU)
2022 – 2024	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)