



Alaric D'Souza

Resident Physician

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About me

Alaric is a Resident Pediatrician in the Boston Combined Residency Program where he cares for pediatric patients at Boston Children's Hospital and Boston Medical Center. He did his MD/PhD at Washington University in St. Louis, and his Computational and Systems Biology dissertation research on Microbial Ecology and antibiotic resistance genes in the Dantas Lab. After residency, Alaric hopes to specialize in Infectious Diseases and lead his own research group studying microbial communities and host-pathogen interactions.

Skills

Software Packages
Adobe Illustrator, Adobe Photoshop, EndNote, LaTeX, Microsoft Office

Programming Languages
Python, R, Bash, Wolfram Mathematica

Languages
English (native)
Hindi (beginner)

Misc.
Computer Hardware, Machining and Fabrication, Welding

research interests

Microbial ecology, bacterial genomics, and antibiotic resistance.

education

- 2014-22 MD Washington University in St. Louis
- 2016-20 PhD Dantas Lab, Washington University in St. Louis
Computational and Systems Biology
- 2010-14 BS Yale University
Ecology and Evolutionary Biology

research and work experience

- 2022-pres. Pediatrics Residency Boston Combined Residency Program
Resident Physician | Medical care for pediatric patients at Boston Children's Hospital and Boston Medical Center.
- 2016-20 Dantas Lab Washington University in St. Louis
Doctoral Candidate | Ecology of hospital built environment bacteria and infant gut microbiota.
- 2015 Dantas Lab Washington University in St. Louis
Rotation Student | Autologous Fecal Microbial Transplant Analysis
- 2012-14 Powell Lab Yale University
Undergraduate Researcher | Foraging behavior of *Aedes aegypti* mosquitoes.
- 2013 Gagneux Lab Swiss Tropical and Public Health Institute
Undergraduate Researcher | Antibiotic resistance and mutation rates in *Mycobacterium tuberculosis*.
- 2012 Schlesinger Lab The Ohio State University
Undergraduate Researcher | Macrophage receptor signaling for *Mycobacterium tuberculosis* phagosome lysosome fusion escape.
- 2011 Seva Dhan Mumbai, India
Summer Intern | Treatment of alcoholics and drug addicts.
- 2011 Course Consulting Canyon High School
Consultant | Course design for AP Psychology and IB Theory of Knowledge.
- 2009 Mentee of Dr. P.S. Wijewarnasuriya Army Research Labs
Summer Intern | Semiconductor photoresist optimization for infrared detectors.

publications

* authors contributed equally

- 2022 Acute and persistent effects of commonly-used antibiotics on the gut microbiome and resistome in healthy adults
Anthony WE, Wang B, Sukhum KV, D'Souza AW, Hink T, Cass C, Seiler S, Reske KA, Coon C, Dubberke ER, Burnham CA, Dantas G, Kwon JH
Cell Reports | 10.1016/j.celrep.2022.110649
- 2022 Structural and molecular rationale for the diversification of resistance mediated by the Antibiotic_NAT family
Stogios PJ, Bordeleau E, Xu Z, Skarina T, Evdokimova E, Chou S, Diorio-Toth L, D'Souza AW, Patel S, Dantas G, Wright GD, Savchenko A
Communications Biology | 10.1038/s42003-022-03219-w
- 2021 Destination shapes antibiotic resistance gene acquisitions, abundance increases, and diversity changes in Dutch travelers.
D'Souza AW*, Boolchandani M*, Patel S, Galazzo G, Hattem J, Arcilla M, Melles D, Jong M, Schultsz C, Dantas G, Penders J
Genome Medicine | 10.1186/s13073-021-00893-z

- 2021 Manure microbial communities and resistance profiles reconfigure after transition to manure pits and differ from fertilized field soil
Sukhum K, Vargas R, D'Souza AW, Boolchandani M, Patel S, Kesaraju A, Walljasper G, Hedge H, Ye Z, Valenzuela R, Gunderson P, Bendixsen C, Dantas G, Shukla S
mBio | 10.1128/mBio.00798-21
- 2020 Environmental remodeling of human gut microbiota and antibiotic resistome in livestock farms
Sun J*, Liao XP*, D'Souza AW*, Boolchandani M*, Li SH*, Cheng K, Martinez JL, Li L, Feng YJ, Fang LX, Huang T, Xia J, Yu Y, Zhou YF, Sun YX, Deng XB, Zeng ZL, Jiang HX, Fang BH, Tang YZ, Lian XL, Zhang RM, Fang ZW, Yan QL, Dantas G, Liu YH
Nature Communications | 10.1038/s41467-020-15222-y
- 2019 Genomic characterization of antibiotic resistant *Escherichia coli* isolated from domestic chickens in Pakistan
Rafique M*, Potter RF*, Ferreira A, Wallace MA, Rahim A, Malik AA, Siddique N, Abbas MA, D'Souza AW, Burnham CD, Ali N, Dantas G
Frontiers in Microbiology | 10.3389/fmicb.2019.03052
- 2019 Cotrimoxazole prophylaxis increases resistance gene prevalence and α -diversity but decreases β -diversity in the gut microbiome of HIV-exposed, uninfected infants.
D'Souza AW*, Moodley-Govender E*, Berla B, Kelkar T, Wang B, Sun X, Daniels B, Coutoudis A, Trehan I, Dantas G
Clinical Infectious Diseases | 10.1093/cid/ciz1186
- 2019 Breakpoint beware: reliance on historical breakpoints for Enterobacteriaceae leads to discrepancies in interpretation of susceptibility testing for carbapenems and cephalosporins and gaps in detection of carbapenem-resistant organisms.
Yarbrough ML, Wallace MA, Potter RF, D'Souza AW, Dantas G, Burnham CD
European Journal of Clinical Microbiology & Infectious Diseases | 10.1007/s10096-019-03711-y
- 2019 Spatiotemporal dynamics of multidrug resistant bacteria on intensive care unit surfaces.
D'Souza AW*, Potter RF*, Wallace M, Shupe A, Patel S, Sun X, Gul D, Kwon JH, Andleeb S, Burnham CD, Dantas G
Nature Communications | 10.1038/s41467-019-12563-1
- 2019 Phenotypic and genotypic characterization of linezolid resistant *Enterococcus faecium* from the USA and Pakistan.
Wardenburg K*, Potter R*, D'Souza AW, Hussain T, Wallace M, Andleeb A, Burnham CA, Dantas G
Journal of Antimicrobial Chemotherapy | 10.1093/jac/dkz367
- 2019 Sequencing-based methods and resources to study antimicrobial resistance.
Boolchandani M*, D'Souza AW*, Dantas G
Nature Reviews Genetics | 10.1038/s41576-019-0108-4
- 2018 Infant diet and maternal gestational weight gain predict early metabolic maturation of gut microbiomes.
Baumann-Dudenhoeffer AM, D'Souza AW, Tarr PI, Warner BB, Dantas G
Nature Medicine | 10.1038/s41591-018-0216-2
- 2018 *Superficieibacter electus* gen. nov., sp. nov., an Extended-Spectrum β -Lactamase Possessing Member of the Enterobacteriaceae Family, Isolated From Intensive Care Unit Surfaces.
Potter RF*, D'Souza AW*, Wallace MA, Shupe A, Patel S, Gul D, Kwon JH, Beatty W, Andleeb S, Burnham CD, Dantas G
Frontiers in Microbiology | 10.3389/fmicb.2018.01629
- 2017 Draft Genome Sequence of the *bla*OXA-436- and *bla*NDM-1-Harboring *Shewanella putrefaciens* SA70 Isolate.
Potter RF*, D'Souza AW*, Wallace MA, Shupe A, Patel S, Gul D, Kwon JH, Andleeb S, Burnham CD, Dantas G
Genome Announcements | 10.1128/genomeA.00644-17
- 2016 The rapid spread of carbapenem-resistant Enterobacteriaceae.
Potter RF*, D'Souza AW*, Dantas G
Drug Resistance Updates | 10.1016/j.drug.2016.09.002
- 2014 Malignant cancer and invasive placentation: A case for positive pleiotropy between endometrial and malignancy phenotypes.
D'Souza AW and Wagner GP
Evolution, Medicine, and Public Health | 10.1093/emph/eou022

published abstracts

- 2021 Microbiome and immune disruption accompany mouse death in a gnotobiotic mouse model of neonatal sepsis
Schwartz D, Wardenburg K, Sharon N, Ning J, Crofts T, D'Souza A, Robinson J, Henderson J, Warner B, Tarr P, Dantas G
Journal of the Pediatric Infectious Diseases Society | 10.1093/jpids/piab031.010
- 2020 The Gut Microbiome and Resistome of Healthy Volunteers are Restructured After Short Courses of Antibiotics
Anthony W, Sukhum K, Cass C, Reske K, Seiler S, Hink T, Coon C, D'Souza A, Wang B, Sun S, Dubberke E, Burnham C-A, Dantas G, Kwon JH
Infection Control & Hospital Epidemiology | 10.1017/ice.2020.476
- 2017 Longitudinal Analysis of ICU Surface Multidrug-resistant Organism Contamination in the US and Pakistan
Kwon JH, D'Souza A, Potter R, Wallace M, Shupe A, Patel S, Gul D, Andleeb S, Burnham C-A, Dantas G
Open Forum Infectious Diseases | 10.1093/ofid/ofx163.245
- 2015 Autologous Fecal Microbiota Transplantation as a Strategy to Prevent Colonization With Multidrug-Resistant Organisms Following Antimicrobial Therapy
Bulow C, D'Souza A, Hink T, Wallace M, Reske K, Sun X, Kwon JH, Burnham C-A, Dantas G, Dubberke E
Open Forum Infectious Diseases | 10.1093/ofid/ofv133.479

invited talks

- 2022 Impacts of swine farm exposure on the human gut microbiota and resistome through genomics and metagenomics
Leman Swine Conference
- 2021 6 mo M presenting with 5 days of fever, emesis, and irritability
BJC/SLCH Infectious Diseases Grand Rounds
- 2021 An exploration of Emergency Department turnaround time data
WUSTL Clinical Informatics Seminar
- 2021 Total thyroidectomy in a 15 yo F with familial adenomatous polyposis
WUSTL GI Seminar
- 2021 Angiomyolipoma in a 9 yo F with tuberous sclerosis
WUSTL Pathology Seminar
- 2020 16S rRNA gene sequencing in bacterial endocarditis
WUSTL Lab Medicine Seminar
- 2019 Effects of antibiotic prophylaxis on the HIV-exposed uninfected infant gut microbiome
WUSTL MSTP Work in Progress Seminar
- 2018 Bacterial contamination on hospital ICU surfaces in the United States and Pakistan
WUSTL Microbiology Department Seminar
- 2018 Bacterial contamination on hospital ICU surfaces in the United States and Pakistan
WUSTL Center for Genome Sciences
- 2018 Bacterial contamination on hospital ICU surfaces in the United States and Pakistan
American Society of Microbiology Micro
- 2017 Bacterial contamination on hospital ICU surfaces in the United States and Pakistan
CSB-MMMP-PMB Interdepartmental Retreat
- 2017 Multidrug resistant organisms on hospital surfaces in the United States and Pakistan
Computational and Systems Biology Retreat
- 2017 Longitudinal analysis of ICU surface microbial contamination in the United States and Pakistan
American Society of Microbiology Micro
- 2017 Effects of trimethoprim-sulfamethoxazole on the microbiomes of HIV- infants born to HIV+ mothers
WUSTL Center for Genome Sciences
- 2017 Antibiotic Resistance: a growing public health crisis
WUSTL Institute of Public Health
- 2013 Drop Team and Rayleigh-Taylor instability
Canyon High School AP biology class
- 2012 Mannose Receptor Signaling
SUCCESS

patents

- 2018 Store-Easy Automotive wheelchair storage device.
Patent US9937088B2
Guertler C, D'Souza AW, Milgrom R, Hong T, Xiao Y, Nadell S

posters

- 2019 Spatiotemporal dynamics of multidrug resistant bacteria on intensive care unit surfaces.
IMM/MICRO Mini WIP
- 2019 Cotrimoxazole prophylaxis increases resistance gene prevalence and α -diversity but decreases β -diversity in the gut microbiome of HIV-exposed, uninfected infants.
American Society of Microbiology (ASM) Microbe
- 2019 Longitudinal analysis of ICU surface microbial contamination in the US and Pakistan
NIAID/IDSA Infectious Diseases Research Careers Meeting
- 2018 Longitudinal Analysis of ICU Surface Microbial Contamination in the US and Pakistan
American Physician Scientist Association (APSA) Midwest meeting
- 2018 Longitudinal Analysis of ICU Surface Microbial Contamination in the US and Pakistan
Lake Arrowhead Microbial Genomics Conference
- 2018 Longitudinal Analysis of ICU Surface Microbial Contamination in the US and Pakistan
American Society of Microbiology (ASM) Microbe
- 2017 Longitudinal Analysis of ICU Surface Microbial Contamination in the US and Pakistan
American Society of Microbiology (ASM) Microbe
- 2017 Longitudinal Analysis of ICU Surface Microbial Contamination in the US and Pakistan
5th annual Global Health & Infectious Disease Conference
- 2014 Invasive populations of *Aedes aegypti* in Central California
Yale Ecology and Evolutionary Biology Poster Session
- 2013 The genetics of foraging behavior in *Aedes aegypti*
Cell Symposia: Genes, Circuits, and Behavior
- 2012 Mannose receptor signaling linking spleen tyrosine kinase and MAP kinase p38 in human macrophages
The Ohio State University SUCCESS program
- 2009 Relationship of spinning time and speed to photoresist thickness on semiconductor wafers
Army Research Labs: Science and Engineering Apprentice Program

awards

- 2022 F. Sessions Cole Award in Pediatrics
- 2022 Alexander Berg Prize
- 2022 Washington University Internal Medicine Club Research Award
- 2021 Gold Humanism Honor Society Inductee
- 2020 Spencer T. and Ann W. Olin Fellow
- 2017-18 Burroughs Wellcome Fund, Institutional Program Unifying Population and Laboratory-Based Sciences
- 2016 BioEntrepreneurship Core Bench to Business Competition
- 2015 IDEA Labs Demo Day Finalist
- 2013 Alan S. Tetelman Fellowship for International Research in the Sciences
- 2013 Paul K. and Evelyn Elizabeth Cook Richter Fellowship
- 2013 Connecticut Space Grant College Consortium Student Project Grant
- 2012 CBC Spouses Cheerios Brand Health Initiative Scholarship
- 2011 CBC Louis Stokes Health Scholarship
- 2010 CBC Louis Stokes Health Scholarship

professional memberships

- 2022-pres. American Academy of Pediatrics
- 2021-pres. Gold Humanism Honor Society
- 2019-pres. Infectious Diseases Society of America
- 2016-pres. American Society for Microbiology

teaching

2022-pres.	Clinical instruction of medical students from Harvard, Boston University, and Tufts Medical Schools
2017-20	Computational Teaching Assistant Fundamentals of Biostatistics Washington University in St. Louis
2017-20	Graduate Mentor Visiting scholars, rotation students, and undergraduates Dantas Lab
2017	Teaching Assistant Microbes and Pathogenesis Washington University in St. Louis
2017	Graduate Mentor IPH Summer Program Washington University in St. Louis
2016	Graduate Mentor Eureka Program Washington University in St. Louis
2013-14	Lecturer Origins of Life Yale Splash
2011-14	Lecturer The Science of Ice Cream Yale Splash

activities and leadership

2022-pres.	Reviewer	Gut Microbes
	Independent peer review of manuscripts on bacterial genomics and metagenomics	
2021-pres.	Reviewer	Microbiology Spectrum
	Independent peer review of manuscripts on bacterial genomics and metagenomics	
2020	Volunteer	Maker Task Force, Washington University in St. Louis/Barnes Jewish Hospital
	Helped produce face shields for hospital	
2019-2020	Volunteer	Saturday Neighborhood Health Clinic
	Seeing patients as a medical student volunteer for the free clinic	
2014-pres.	Yale Admissions Interviewer	Yale Alumni Schools Committee
	Interviewer for Yale College admissions of prospective undergraduate students	
2015-17	Physicians for Human Rights	Washington University in St. Louis
	Co-President of club focusing on human rights and political issues that relate to medicine, including health-care for prisoner, refugees, and underserved communities	
2014-17	Store-Easy	Washington University in St. Louis - Sling Health
	Company seeking to improve manual wheelchair storage in automobiles	
2012-14	NASA Microgravity University (Drop Team)	Yale University
	Undergraduate research team selected by NASA to conduct fluid mechanics research in zero-gravity	
2012-14	Splash at Yale	Yale University
	Undergraduate group teaching short courses to middle and high school students	
2011-14	Big Sib	Yale University - Pierson College
	Mentor to freshman students at Yale University	