



# 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 Computational and Systems Biology	Dantas Lab, Washington University in St. Louis
2010-14	BS Ecology and Evolutionary Biology	Yale University

## research and work experience

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

## 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 <i>Cell Reports</i>   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 <i>Communications Biology</i>   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 <i>Genome Medicine</i>   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  $\alpha$ -diversity but decreases  $\beta$ -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  $\beta$ -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, Shalon 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

- 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  $\alpha$ -diversity but decreases  $\beta$ -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

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

## teaching

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

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