

Hannah Whitehurst, PhD

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EDUCATION

Doctor of Philosophy in Ecology and Evolution University of Chicago <i>Chicago, IL</i>	Aug 2023
Bachelor of Arts, Cum Laude Whittier College <i>Whittier, CA</i> Study abroad, Fergusson College <i>Pune, India</i>	May 2012 2010

SKILLS

Sequencing: DNA/RNA extraction, fragment analyzers, liquid handler automation, (q/rt)PCR, primer/adaptor design, Illumina chemistry, wgDNA libraries, QC and quantification, Hi/Mi/NextSeq

Bioinformatics: linear mixed models, GWAS, RNA transcriptomics, SNV calling, NGS processing, heritability analysis, building phylogenetic trees, genome assembly, network building and analysis

Computation: R, Python, HPC, Geneious, BBtools, Samtools, Shiny, Linux, Confluence, Bash, Git

Microbiology: transformation, sterile techniques, amplicon sequencing, classification, natural isolate collection

RESEARCH EXPERIENCE

University of Chicago <i>Chicago, IL</i> Doctoral Researcher, Dr. Joy Bergelson Laboratory	Aug 2016 – Aug 2023
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Microbiology and NGS laboratory experience

- Prepped, QC'd, and sequenced samples for Illumina sequencing, including; 1000 leaf microbiome communities (DNA), 6000 amplicon, 25 plant phloem (RNA), and 200 microbial wgDNA libraries
- Isolated ~5000 natural leaf microbes for *in planta* empirical studies, classified with amplicon sequencing, and wrote LIMS R Shiny web application incorporating BLAST functionality for stocks

Genomics and Bioinformatics experience

- Built microbial networks and performed GWAS using microbial abundance data in *A. thaliana*, successfully identifying ~200 host gene candidates shaping leaf microbiomes
- Expanded differential microbial abundance model to include microbe-microbe interactions through community networks, showing significant improvement in model fit for >95% of microbe data tested
- Built *gyrB* taxonomic database pulling gene records from NCBI, JGI; sequenced and assembled 288 *denovo* genomes from isolates, generated phylogenies, and verified improved concordance over 16S
- Studied the movement of protein through phloem, analyzing

University of Chicago <i>Chicago, IL</i> Research Specialist, Genomics Sequencing Core Facility	Aug 2014 – Aug 2016
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- Tested thousands of samples using fragment analyzers (TapeStation, Bioanalyzer) and qPCR for internal and external clients, providing clients with consulting for subsequent sequencing
- Ran and maintained the Illumina HiSeq4000 and MiSeq

WORK EXPERIENCE

New York University *New York, NY*

Aug 2021 – Aug 2022

Lab Manager, Biology Department

- Organized and rebuilt Bergelson research lab after moving to New York University from University of Chicago, facilitating research space for six postdoc and graduate researchers
- Managed daily operations of the lab; purchasing orders, chemical waste management, equipment maintenance, and spending reports
- Ported 135 TB of research data between institutions using bash scripts and Linux environments
- Built lab wiki (Confluence) to centralize standard operating procedures (SOPs) and manage vendor contacts, empowering researchers to execute their projects with independence
- Assisted with IBC protocols and implemented measures for USDA compliance for natural and transgenic plant and microbe experiments, resulting in uninterrupted, safe, ongoing research

Goby *Chicago, IL*

Sep 2012 – Aug 2014

Project Manager

- Managed utility and purchasing data for over 200 properties using Salesforce, Asana, and Excel
- Successfully led eight, six-month LEED projects on time and under budget for skyscrapers

SELECT PUBLICATIONS AND PRESENTATIONS

Presenter, Microbiome Research Symposium (2023) “Improving microbiome community studies with *gyrB*”

Brachi, B., **Whitehurst, H**, Filiault, D., Darne, P., Mentec, M. L., Kerdaffrec, E., Rabanal, F., ... & Bergelson, J. (2022). Plant genetic effects on microbial hubs impact host fitness in repeated field trials. *PNAS*.

Whitehurst, H, Bartoli, C., Roux, F., Bergelson J. (2023) Effectiveness of *gyrB* amplicon in characterizing microbial taxa in *A. thaliana* leaf communities. *In prep*.

Whitehurst, H, Brachi, B., Bergelson J. (2023) Improving GWAS statistical power in microbiome studies using ecological networks. *In prep*.

Poster, *International Society of Plant Microbe Interactions*. 2019. “Absolute counts versus relative abundances in characterizing *A. thaliana* leaf bacterial communities”

Presenter, *Southern California Conference on Undergraduate Research*. 2012. “Biodiversity in correlation to pollution along Pune River in Pune, India”

AWARDS

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| • NSF Graduate Research Fellow (2016-2021)
GRFP, award for graduate students | • Whittier Scholar of the Year (2012)
Recognition for senior research project |
| • John Greenleaf Merit Scholarship (2008-2012)
>\$80,000, merit based | • Omicron Delta Kappa (2010-2012)
Leadership Honor Society |

TEACHING EXPERIENCE

Guest lecture, “Introduction to *Pseudomonas syringae*”

2021

University of Illinois Urbana-Champaign | Professor Dr. Rachel Whitaker

Teaching Assistant, Molecular Evolution 2021

University of Chicago | Professor Dr. Martin Kreitman

- Held biweekly office hours to assist students with computational labs using R, Muscle alignment, and phytree (Python) to teach key concepts in population genetics
- Led one class using empirical research to teach concordance estimations

Teaching Assistant, Fundamentals of Ecology and Evolutionary Biology 2020

University of Chicago | Professors Dr. Trevor Price and Dr. Marcus Kronforst

- Led weekly computational labs with ~30 student, using R to teach ecological concepts using empirical datasets
- Graded weekly quizzes and assisted in exam assessments, providing timely feedback

Teaching Assistant, Genome Hackers 2019

University of Chicago | Rebecca Satterwhite, M.S., Dr. Ayse Tenger-Trolander

- Volunteered at one-week long day camp for teenage girls in South Chicago
- Wrote and led class teaching natural selection with R scripts and hands-on activities

MENTORSHIP

Arushi Ran, Undergraduate Researcher, University of Chicago 2018-2019

Riley Leff, Undergraduate Researcher, University of Chicago 2017-2018

VOLUNTEER AND EXTRA CURRICULAR ACTIVITIES

Volunteer, “Dignity Diner”, food service for community members (weekly, 2023)

Volunteer, “Expanding Your Horizons” science outreach program (2018)

Volunteer, Presenter “French Science Fair” (2017-2018)

Volunteer, Graduate Council Representative for Ecology and Evolution (2016-2019)

Volunteer, public outreach, Peggy Notebaert Nature Museum (weekly, 2015-2016)