

Nur M. Shahir

TRANSLATIONAL BIOINFORMATICIAN

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Research Interests

- Environment-host-microbe interactions in the context of human health
- Interplay between host's gut microbiota and nervous system
- Multi-omics approaches to human health and/or public health

Education

University of North Carolina at Chapel Hill

PH.D. IN BIONFORMATICS AND COMPUTATIONAL BIOLOGY

- Advisor(s): Dr. Terry S. Furey, Dr. Shehzad Z. Sheikh
- Committee: Dr. Michael I. Love (chair), Dr. Yufeng Liu, Dr. Ian Carroll

Chapel Hill, NC

Aug. 2014 - May 2020

University of Maryland, Baltimore County

M.S. IN STATISTICS, TRACK: BIOSTATISTICS

- Advisor: Dr. DoHwan Park
- Capstone: Longitudinal Analysis of Urea Cycle Disorder Patients

Baltimore, Maryland

2011 - 2013

Massachusetts Institute of Technology

S.B. IN MATHEMATICS

Cambridge, MA

2006 - 2010

Skills

Programming R, SAS, Python, SQL, C/C++, JAVA, HTML5, LaTeX, bash, QIIME2

Research Experience

Graduate Research Assistant

University of North Carolina at

Chapel Hill

ADVISORS: TERRENCE S. FUREY, SHEHZAD Z. SHEIKH

Winter 2015 - PRESENT

- Performed exploratory analysis and association studies of the mucosa-adherent microbial populations of the human colon and terminal ileum in Inflammatory Bowel Disease (IBD) and surgical controls
- Developed bioinformatic workflow for microbiome samples for use on the computing clusters, kure and longleaf.
- Applied various bioinformatic tools including: QIIME, DADA2, phyloseq, PICRUST.
- Presented research at local and national conferences.

Graduate Research Assistant (Research Rotations)

University of North Carolina at

Chapel Hill

ADVISOR: DR. JONATHAN BERG; DR. ALAIN LAEDERACH

Summer 2014, Fall 2014

- Research Areas: Development of an informatics approach for the analysis of human exome sequencing data to augment newborn screening; Computational identification of RNA splice junctions in SERPINA1, a serine protease inhibitor.

Graduate Research Assistant

University of Maryland, Baltimore

County

ADVISOR: DR. DOHWAN PARK

Fall 2013

- Conducted Capstone research project under the mentorship of Dr. DoHwan Park
- Generated a longitudinal model using data from the Urea Cycle Disorder Consortium

Summer Fellow

MENTOR(S): DR. JULIE SEGRE, DR. SEAN CONLAN

Summer 2012

- Piloted a study on the viral diversity of the human skin through the use of metagenomic datasets acquired from the human microbiome project.
- Assisted with fungal speciation of *Malassezia* species through bioinformatic tools
- Applied various bioinformatic tools including: Clustal, BioPython, BioPerl, and Bowtie
- Extracted full viral genomes from metagenomic datasets
- Presented research at NHGRI and NIH poster sessions.

Summer Fellow

*Medical Genetics Branch,
National Human Genome Research
Institute*

MENTOR(S): DR. ELLEN SIDRANSKY, DR. NAHID TAYEBI

Summer 2009

- Worked on defining the association between glucocerebrosidase mutations and Parkinsons disease.
- Learned and applied biological methods: including sequencing, PCR, westerns, RNA and protein extractions.
- Performed statistical analysis on gene expression data via Excel
- Trained incoming fellows in lab protocols
- Presented research at NHGRI and NIH poster sessions

Summer Fellow

*Biochemical Pathology Section,
National Cancer Institute*

MENTOR(S): DR. DAVID D. ROBERTS, DR. MICHAEL PENDRAK

Summer 2007

- Worked on the development of a modification of a tetracycline-regulating system for developmental regulation in *Candida albicans*.
- Learned and applied methods in molecular biology and bioinformatics including: PCR, gel electrophoresis, BLAST, ClustalW, DNA purification.
- Trained incoming high school intern in lab protocols.

Publications

ACCEPTED

Shahir NM, Wang JR, Wolber EA, Schaner MS, Frank DN, Ir D, Robertson CE, Chaumont N, Sadiq TS, Koruda MJ, Rehbar R, Nix BD, Newberry RD, Sartor RB, Sheikh SZ, Furey TS

Crohn's Disease Differentially Affects Region Specific Composition and Aerotolerance Profiles of Mucosally-Adherent Bacteria

Inflammatory Bowel Diseases. doi:10.1093/ibd/izaa103. PMID 32469069

Teaching Experience

Course Coach for Initiative Maximizing Student Development (IMSD)

*University of North Carolina at
Chapel Hill*

CLASS: INTRODUCTION TO STATISTICAL MODELING

Fall 2016

- Lead tutoring sessions for graduate students in IMSD.
- Created lesson plans and evaluated student performance over the course of a semester.

Teaching Assistant

*University of North Carolina at
Chapel Hill*

CLASS: INTRODUCTION TO STATISTICAL MODELING

Fall 2015

- Served as a guest lecturer for the class
- Collaborated on curriculum development.
- Held regular office hours and met with students upon request.
- Graded all written work.

Coding Instructor

*University of North Carolina at
Chapel Hill*

HOW TO LEARN TO CODE - R PROGRAMMING LANGUAGE

Summer 2015

- Collaborated on curriculum and pre-test development.
- Lead small group lectures on topics and concepts in R.
- Served as a guest lecturer for main lecture portion of class.

Teaching Assistant

CLASSES: CALCULUS I, CALCULUS II, INTRODUCTION TO MATHEMATICAL INFERENCE (GRADER)

- Collaborated on curriculum and exam development.
- Held regular office hours and met with students upon request.
- Served as substitute lecturer.
- Graded all written work, including final exam papers.

University of Baltimore, Baltimore
County

Spring 2012 - Fall 2013

Math Coach

MATH GYM

- Assisted with mathematics remediation for undergraduate students.

University of Baltimore, Baltimore
County

Fall 2013

Honors & Awards

2015 **NIH T32 Fellow**, Bioinformatics and Computational Biology Predoctoral Training Grant

NIH

Presentations

EXTERNAL TALKS

Crohn's Disease Differentially Affects Intestinal Region Composition and Aerotolerance Profiles of Mucosally-Adherent Bacteria

Virtual

VIRTUAL MICROBIOME SUMMIT

May. 2020

IBD differentially affects region specific composition and aerotolerance profiles of mucosal-adherent bacteria

Virtual

MIT AND UNC JOINT VIRTUAL MICROBIOME SEMINAR SERIES

May. 2020

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

Crohn's Disease and the Intestinal Microbiota

Chapel Hill, NC

GENETICS RESEARCH COLLOQUIUM

Dec. 2016

Alterations in the Mucosal-Adherent Enteric Microbiota Between CD and nonIBD

Chapel Hill, NC

TRANSLATIONAL MEDICINE CLOSED DOOR TALKS

Oct. 2016

A distinct microbiota signature characterizes patients with penetrating Crohn's disease

Chapel Hill, NC

CENTER FOR GASTROINTESTINAL BIOLOGY AND DISEASE

Oct. 2015

Analysis of the Composition and Diversity of the Colonic Mucosa Microbiota in Crohn's Disease

Chapel Hill, NC

BIOINFORMATICS AND COMPUTATIONAL BIOLOGY CURRICULUM NEW STUDENT TALKS

May 2015

Identification of SERPINA1 Splice Variants from Next-Gen Sequencing Data

Chapel Hill, NC

BIOINFORMATICS AND COMPUTATIONAL BIOLOGY RESEARCH IN PROGRESS TALKS

Oct. 2014

Posters

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

Characterizing the Intestinal Mucosal Landscape in Inflammatory Bowel Disease

Chapel Hill, NC

GENETICS DEPARTMENT RETREAT

Aug. 2017

Analysis of the Composition and Diversity of the Colonic Mucosa Microbiota in Crohn's Disease

Chapel Hill, NC

GENETICS DEPARTMENT RETREAT

Aug. 2016

Analysis of the Composition and Diversity of the Colonic Mucosa Microbiota in Crohn's Disease

CENTER FOR GASTROINTESTINAL BIOLOGY AND DISEASE POSTER SESSION

Chapel Hill, NC

Jul. 2015

Analysis of the Composition and Diversity of the Colonic Mucosa Microbiota in Crohn's Disease

INFORMATION TECHNOLOGY SERVICES RESEARCH COMPUTING SYMPOSIUM

Chapel Hill, NC

May 2015

EXTERNAL

Analysis of mucosal adherent 16S rRNA reveals altered microbial composition and decreased diversity in patients with Crohns disease

AMERICAN SOCIETY FOR HUMAN GENETICS

Baltimore, MD

Oct 2015

Leadership, Service, & Professional Development

Graduate and Professional Student Federation

SENATOR, ELECTED

- Represented department in Graduate and Professional Student Federation (GPSF).
- Assisted in crafting legislation for legislative body of GPSF.

University of Chapel Hill at North
Carolina

Aug. 2017 - Aug. 2019

Rigor and Reproducibility Workshop

PARTICIPANT

- Participated in a three week long, biweekly workshop in rigor and reproducibility in biomedical research.

University of Chapel Hill at North
Carolina

May 2016