

Quang P. Nguyen

Curriculum Vitae

03784, West Lebanon NH
✉ quangpmnguyen@gmail.com
📱 qpmnguyen.netlify.app

Education

- 2017 - current **PhD in Quantitative Biomedical Sciences**, *Dartmouth College*, Hanover, NH.
Advisors: Anne G. Hoen, PhD and H. Robert Frost, PhD
Thesis title: Approaches in incorporating functional and ecological relationships to microbiome-outcome analyses
- 2013 - 2017 **B.S. in Biological Chemistry and Mathematics**, *Bates College*, Lewiston, ME.
Advisors: Larissa M. Williams, PhD
Thesis title: Bioinformatic analysis of transcription factor Nfe2 in zebrafish development

Publications

- 2021+ Robert A. Shumsky, Laurens Debo, Rebecca M. Lebeaux, **Quang P. Nguyen**, Anne G. Hoen. Retail Store Customer Flow and COVID-19 Transmission. *Under Review at PNAS*.
- 2021+ Jie Zhou, Anne G. Hoen, Susan McRitchie, Wimal Pathmasiri, Weston D. Viles, **Quang P. Nguyen**, Juliette C. Madan, Erika Dade, Margaret R. Karagas, Jiang Gui. Information Enhanced Model Selection for Gaussian Graphical Model with Application to Metabolomic Data. *Under Review*.
- 2021+ **Quang P. Nguyen**, Anne G. Hoen. & H. Robert Frost Taxonomic enrichment analysis using competitive isometric log-ratios. *In prep*.
- 2021+ **Quang P. Nguyen**, Anne G. Hoen. & H. Robert Frost An independent filter method for feature selection in microbiome relative abundance data. *In prep*.
- 2020+ **Quang P. Nguyen**, Margaret R. Karagas, Juliette C. Madan, Erika F. Dade, Hilary G. Morrison, Susan J. Sumner, Wimal W. Pathmasiri, Susan McRitchie, H. Robert Frost & Anne G. Hoen. Multi-omic Analysis of the Taxa-Function Relationship in Infant Gut Microbiomes. *Under Review at BMC Microbiology*.
- 2019 Emily F. Winterbottom, Yuka Moroishi, David A. Armstrong, Paul J. Beach, **Quang P. Nguyen**, Nagi Ayad, Carmen J. Marsit, Zhigang Li, Margaret R. Karagas, David J. Robbins. Prenatal arsenic exposure alters the placental expression of multiple epigenetic regulators in a sex-dependent manner, and may increase the risk of congenital heart defects via PRDM6 inhibition. *BMC Environmental Health*, 18(1):18, February 2019

- 2018 Hoa L. Nguyen, Duc A. Ha, Robert J. Goldberg, Catarina I. Kiefe, Germán Chiriboga, Ha N. Ly, Cuong K. Nguyen, Ngoc T. Phan, Nguyen C. Vu, **Quang P. Nguyen**, and Jeroan J. Allison. Culturally adaptive storytelling intervention versus didactic intervention to improve hypertension control in Vietnam- 12 month follow up re- sults: A cluster randomized controlled feasibility trial. PLOS ONE, 13(12):e0209912, December 2018.
- 2017 Hoa L. Nguyen, Jeroan J. Allison, Duc A. Ha, Germán Chiriboga, Ha N. Ly, Hanh T. Tran, Cuong K. Nguyen, Diem M. Dang, Ngoc T. Phan, Nguyen C. Vu, **Quang P. Nguyen**, and Robert J. Goldberg. Culturally adaptive storytelling intervention versus didactic intervention to improve hypertension control in Vietnam: A cluster-randomized controlled feasibility trial. Pilot and Feasibility Studies, 3(1):22, May 2017.

Research Experience

- 09/2019 - current **Statistical Consultant**, *Dartmouth College - SYNERGY Institute*, Lebanon, NH.
- Collaborated with physicians at Dartmouth-Hitchcock on data processing and statistical analysis tasks for translational research projects.
 - Current project: Analysis of longitudinal epilepsy patient data to determine the impact of new anti-epileptic drugs using inverse propensity score weighting and ordinal mixed models. Paper in preparation.
- 08/2017 - current **Doctoral Research**, *Dartmouth College - Hoen & Frost Labs*, Hanover, NH.
- Thesis Title: Approaches in incorporating functional and ecological relationships to microbiome-outcome analyses
- Developed a statistical method for sample-level competitive enrichment testing for microbiome relative abundance data based on the isometric log-ratio transformation. Paper in preparation.
 - Developed an independent taxonomic filter feature selection method for microbiome relative abundance data based on Laplace Scores of ensembles of ecological distance metrics.
 - Performed predictive modelling of NMR metabolomics profiles from DNA-based microbiome profiles using machine learning approaches. Paper under review at BMC Microbiology.
 - Analyzed shotgun metagenomic sequencing data end-to-end from raw reads using Python and command line tools to infer community and functional differences between two archaeal populations in solar salterns.
 - Implemented an end-to-end pipeline to analyze 16S rRNA data using DADA2 and R to infer differences in community composition in colon samples between cancer and healthy patients.
- 05/2016 - 05/2017 **Undergraduate Research**, *Bates College - Williams Lab*, Lewiston, ME.
- Thesis Title: Bioinformatic analysis of transcription factor Nfe2 in zebrafish development
- Performed differential abundance and functional enrichment analyses of RNA-Seq data using DESeq2 and DAVID to infer the role of transcription factor Nfe2 in normal zebrafish development.
 - Conducted gain-of-function assay to validate the significance of Alas2 gene in heme biosynthesis identified from bioinformatics analyses.

- 06/2015 - 08/2015 **Research Assistant**, *Institute of Population, Health and Development*, Hanoi, Vietnam.
- Project Title: Culturally adaptive storytelling intervention versus didactic intervention to improve hypertension control in Vietnam
- Collected and translated interview samples contributing to a pilot study for a novel storytelling-based intervention to improve hypertension control in Vietnam
 - Assisted in drafting the English manuscript for both the pilot (published Dec 2017) and main (published Dec 2018) studies.

Honors and Awards

- 2020 **DIFUSE Fellowship** - National Science Foundation
- 2017 **Graduate Fellowship** - Dartmouth College
- 2017 **Dean's List** - Bates College
- 2016 **Maine INBRE Summer Research Grant**
- 2016 **Charles Summer Libby Award** - Brooks Quimby Debate Council
- 2013 **Bates College Undergraduate Scholarship**

Presentations

- 2020 **NESS NextGen**, *Taxonomic enrichment analysis using isometric log-ratios*, Virtual, Poster.
- 2020 **Virtual Microbiome Conference**, *The infant gut microbiome is associated but not strongly predictive of stool metabolite concentrations*, Virtual, Contributed Talk.
- 2019 **Northeast Regional IDeA Conference**, *Healthy Infant Metabolomes are Robust to Changes in the Microbiome*, Breton Woods, NH, Poster.
- 2017 **Mount David Summit**, *The role of transcription factor Nfe2 in zebrafish development*, Lewiston, ME, Contributed Talk.
- 2016 **Parents' Weekend**, *Bioinformatic Analysis of bulk RNA-Seq data to infer the role of transcription factor Nfe2 in normal zebrafish development*, Lewiston, ME, Poster.

Teaching Experience

- 2020 **DIFUSE (Data Science Infused Undergraduate STEM Education)**, *Dartmouth College*, Hanover, NH, *NSF Fellow*.
- Collaborated with faculty to deliver data science modules in basic science classes.
 - Designed and implemented an interactive application for students to explore and model Eddy Covariance data sets ([Link](#)).
- 2018 **QBS120: Statistical Theory**, *Dartmouth College*, Hanover, NH, *Teaching Assistant*.
- Tutored Masters and PhD students in graduate level statistical inference course.
 - Designed and taught a weekly session reviewing and practicing relevant material and problems

- 2014 - 2017 **Bates College Writing Center**, *Bates College*, Lewiston, ME, *Peer Writing Tutor*.
- Instructed students in first year seminars on college level writing and communication.
 - Guided students from a variety of disciplines in drop-in sessions focusing on effective academic writing.

Service

- 2020 - current **The COVID Tracking Project**, *The Atlantic*, Virtual, *Data Quality and Science Communication*.
- Published 4 articles on different aspects of COVID-19 data reporting including death count definitions, probable case definitions, usage of antibody tests, and antigen test reporting guidelines.
 - Lead teams collecting, annotating, and interpreting daily COVID-19 data from official state dashboards.
 - Determined guidelines for public data presentation and reporting based on in-depth research with forthcoming white paper
- 2020 - current **The R Journal**, *Peer Reviewer*.
- 2019 - current **Epidemiology Club**, *Dartmouth College*, Lebanon, NH, *Executive Board*.
- 2019 - 2020 **New Hampshire Academy of Sciences**, Lyme, NH, *Volunteer Reviewer*.
- 2017 - 2018 **QuantBlitz Data Analysis Club**, *Dartmouth College*, Hanover, NH, *Member*.

Professional Affiliations

- 2020-current **Society of Epidemiological Research**, *Member*.
- 2017-2020 **Sigma Xi**, *Member*.

Relevant Coursework

- Graduate Foundations of Biostatistics I/II/III, Foundations of Epidemiology I/II, Applied Epidemiological Methods I, Foundations of Bioinformatics I/II, Machine Learning and Statistical Data Analysis, Applied Machine Learning, Biostatistics Consulting Lab, Clinical Epidemiology
- Undergraduate Mathematical Models in Biology, Graph Algorithms, Real Analysis, Probability Theory, Mathematical Statistics, Biostatistics, Linear Algebra, Multivariable Calculus, Computability Theory, Molecular Biology, Biological Chemistry I/II, Organic Chemistry I/II, Advanced Inorganic Chemistry, Advanced Genetics
- Certifications Strategies and Techniques for Analyzing Microbial Population Structures (STAMPS 2019)
Python for Data Science and Machine Learning Bootcamp (Udemy, 2019)
Data Science and Machine Learning Bootcamp in R (Udemy, 2017)

Skills

- Software Programming: R, Python, Julia, Bash
Version Control: Git
Notebooks: Rmarkdown, Jupyter Notebooks, Pluto Notebooks, LaTeX
Workflows: Snakemake, Targets, Drake
Deep Learning Frameworks: PyTorch

Bioinformatics	Experienced in processing metagenomic DNA sequencing data (amplicon and shotgun sequencing) Tools used: AMPHORA2, metaSPAdes, PRODIGAL, DIAMOND, bowtie2, MUSCLE, phyloseq, vegan, ape, DADA2 Databases: NCBI SRA, EGGNOG, SILVA, KEGG
Statistical	Experienced in analyzing high-dimensional data sets using statistical learning methods in R

References

Anne G. Hoen, PhD

- Associate Professor of Epidemiology, Biomedical Data Science & Microbiology and Immunology
- Anne.G.Hoen@Dartmouth.edu

H. Robert Frost, PhD

- Assistant Professor of Biomedical Data Science
- Hildreth.R.Frost@Dartmouth.edu

Margaret R. Karagas, PhD

- Department Chair and James W. Squires Professor of Epidemiology
Professor of Community and Family Medicine
- Margaret.R.Karagas@Dartmouth.edu

A. James O'Malley, PhD

- Professor of The Dartmouth Institute
Professor of Biomedical Data Science Lebanon, NH 03756
- James.OMalley@Dartmouth.edu