RAJEE GANESAN
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EDUCATION

CARNEGIE MELLON UNIVERSITY   **Pittsburgh, PA**
Second Year Ph.D. Student in Department of Biology   **Exp. 2026/2027**

UNIVERSITY OF NORTH CAROLINA, CHAPEL HILL   **Chapel Hill, NC**
Bachelor of Science in Quantitative Biology, Minors in Data Science and Statistics [*Cum Laude, Dean's List*]   **May 2022**

Relevant Coursework: *Italics indicate graduate level coursework*
- **Bioinformatics:** *Bioinformatics Data Practicum Genomics and Epigenetics of the Brain, Modeling Evolution,* Bioalgorithms, Biostatistics, Computational Sociology, Analysis of Functional Genomics Experiments
- **Computer Science:** *Practical Computing and Data Analysis*, Object-Oriented Design, Data Structures
- **Biology:** *Advanced Genetics*, Cell Biology, Molecular Biology, Evolutionary Genetics
- **Mathematics & Physics:** Vector Calculus, Decision Sciences, Statistics II, Mechanics, Electricity and Magnetism

EXPERIENCE

Carnegie Mellon University, Departments of Biology, Computational Biology   **Pittsburgh, PA**
Ph.D. Student in Pfenning Lab, Rotation Student in Pfenning, Ettensohn, and McManus Labs   **July 2022-Present**
- Executing projects that use computational approaches to study vocal learning and convergent evolution at a single cell level in order to uncover variants affected in pathways related to speech for experimental validation.
- Evaluated gaps in ongoing research and designed feasible projects to contribute meaningfully to the field.
- Developed an internal pipeline using Bash scripting and public tool integration that determined 3'/5' bias in RNA sequencing was not indicative of mRNA decay.
- Executed experimental analysis on urchin developmental stages and prepared a dozen samples for external sequencing.
- Regularly compiled, organized and presented research updates and findings at departmental and large group conferences.

Furey Lab, UNC Department of Medicine   **Chapel Hill, NC**
Senior Research Intern   **Aug 2019 – Apr 2022**
- Implemented a bioinformatics pipeline using Perl, Bash and Python scripting in a supercomputing environment to identify sites of allelic imbalance in Crohn's disease patients to better understand potential variants to treat using gene therapies.
- Designed, implemented and troubleshot pipeline testing guanine quadruplex formation in stimulated IL 10 KO macrophages.
- Completed and presented major Honors Thesis with results revealing regional correlation to disease-related genes.
- Mentored and managed two undergraduate students through reimplementation of the pipeline for alternative datasets.

Watts Lab at National Institutes of Environmental Health Sciences, National Institutes of Health   **Durham, NC**
Scholars Connect Program Research Fellow   **June 2021- April 2022**
- Developed computational methods using R, Bash and Python scripting to accurately identify regions forming quadruplexes, and integrated experimental results confirming a correlation between these regions and polymerase pausing/gene expression.
- Created and delivered communicative research presentations biweekly and quarterly at internal and external meetings.

Meyer Lab at Cold Spring Harbor Laboratory   **Cold Spring, NY**
Summer Research Intern   **May 2021 – Aug 2021**
- Integrated single-cell RNA-seq and ATAC-seq data to study AIRE expression in medullary thymic epithelial cells, proving that alterations in open chromatin drove autoimmune regulation in these cells, regulatings self-reaction.
- Created and presented a final talk at the CSHL symposium to the department and invited guests.
- Delivered final report detailing findings and outlining next steps for full-time employees of the lab in lieu of results.

Carolina Housing   **Chapel Hill, NC**
Residential Computing (IT) Consultant   **Aug 2020 – May 2021**
- Utilized ServiceNow to problem-shoot digital tickets pertaining to network issues, including ethernet and internet, hardware issues, and other general technical issues for an undergraduate population of ~1000 students.
- Collaborated with a team of 45 other consultants to diagnose and solve student software and hardware issues.

UNC Division One Baseball   **Chapel Hill, NC**
Data Analyst   **Dec 2019 – Dec 2020**
- Collaborated with 18 analysts to develop game insights using R, assessing likelihoods of certain pitches in various situations.
- Created easy-to-read scouting reports for upcoming opponents by compiling and organizing data for coaches and players.

Colbert Lab at NIAMS, National Institutes of Health   **Bethesda, MD**
Translational Pediatrics Branch Summer Research Intern   **May 2019 – Aug 2019**
- Analyzed genome wide protein expression assessed by broad proteomic analysis from peripheral blood in Juvenile Dermatomyositis patients, utilizing a variety of computational softwares including R, JMP and Ingenuity Pathway Analysis.
- Organized and presented results regularly at internal meetings and delivered the final poster for NIH's Summer Poster Day.

Ley Lab at La Jolla Institute for Allergy and Immunology   **La Jolla, CA**
Research Intern   **Jan 2019 – June 2020**
- Experimentally used fluorescent and confocal microscopy in conjunction with antibody staining and image analysis software to study the biophysics of neutrophil motor function and leukocyte rolling.
- Developed understanding of research design, experimental troubleshooting, technical and protocol writing.

Zaniac Parkside   **Cary, NC**
STEM Head Instructor, Administrative Assistant   **June 2017 – May 2021**
- Developed, taught and implemented curriculum for students from grades K-8 on a variety of STEM topics.
- Led instructional team of 15-20 employees and performed administrative duties, such as onboarding and scheduling.

PUBLICATIONS
- **Rajee Ganesan**, Terrence S. Furey. (2022) Impact of guanine quadruplex formation on transcription and open chromatin regions in stimulated IL 10 KO macrophages. [10.17615/4vg8-aj33]
- Marki A, Buscher K, Lorenzini C, Meyer M, Saigusa R, Fan Z, Yeh YT, Hartmann N, Dan JM, Kiosses WB, Golden GJ, **Ganesan R**, Winkels H, Orecchioni M, McArdle S, Mikulski Z, Altman Y, Bui J, Kronenberg M, Chien S, Esko JD, Nizet V, Smalley D, Roth J, Ley K. Elongated neutrophil-derived structures are blood-borne microparticles formed by rolling neutrophils during sepsis. J Exp Med. 2021 Mar 1. [10.1084/jem.20200551.]

TEACHING
- BIOL 03133, Neurobiology of Disease [Teaching Assistant, Instructor: Daniel J. Brasier, Ph.D.]

PRESENTATIONS
- **Rajee Ganesan**, Joel C. McManus (Feb 2023) "Predicting RNA decay rates based on 3'/5' bias in RNA-sequencing data" [Talk]
- **Rajee Ganesan,** Andreas Pfenning (Nov 2022) "Vocal learning cell type associations in zebra finch snRNA-seq data" [Talk]
- **Rajee Ganesan**, Terrence S. Furey. (April 2022) "Impact of guanine quadruplex formation on transcription and open chromatin regions in stimulated IL 10 KO macrophages". Department of Biology Honors Thesis Symposium. [Talk]
- **Rajee Ganesan**, Jason A. Watts. (April 2022). "Guanine quadruplex formation is associated with tonicity-responsive gene expression." NIEHS Scholars Connect Program Final Symposium [Talk].
- **Rajee Ganesan**, Hannah Meyer. (August 2021) "Integrative Analysis of single cell expression and chromatin states in Medullary Thymic Epithelial Cells". Cold Spring Harbor Laboratory Summer Interns' Final Symposium [Talk]
- **Rajee Ganesan**, Jason A. Watts. (July 2021) "Guanine-Quadruplex Formation Regulates RNA Polymerase II Pausing and Gene Expression". NIEHS Scholars Connect Program Quarterly Poster Session [Poster]
- **Rajee Ganesan**, Terrence S. Furey. (October 2020) "Allelic Imbalance Analysis in Colonic Tissue in Crohn's Disease". BIOL395 Final Research Course Presentation. [Poster]
- **Rajee Ganesan**, Terrence S. Furey. (October 2020) "Allelic Imbalance Analysis in Colonic Tissue in Crohn's Disease". State of North Carolina Undergraduate Research & Creativity Symposium. [Poster]
- **Rajee Ganesan**, Angélique Biancotto, Foo Cheung, Terrance O'Hanlon, Yan Huang, Kamelia Zerrouki, Melissa de Los Reyes, Saifur Rahman, Kerry A. Casey, Frederick W. Miller, Raphaela Goldbach-Mansky, Lisa G. Rider, and Hanna Kim. (August 2019) "Novel Serum-Based Proteomic Analysis in Juvenile Dermatomyositis (JDM)". NIEHS Autoimmune Presentation. [Talk]
- **Rajee Ganesan**, Angélique Biancotto, Foo Cheung, Terrance O'Hanlon, Yan Huang, Kamelia Zerrouki, Melissa de Los Reyes, Saifur Rahman, Kerry A. Casey, Frederick W. Miller, Raphaela Goldbach-Mansky, Lisa G. Rider, and Hanna Kim. (August 2019) "Novel Serum-Based Proteomic Analysis in Juvenile Dermatomyositis (JDM)". NIH Poster Day Presentation. [Poster]

OUTREACH & STUDENT ORGANIZATIONS
UNC Tau Iota Chapter of Beta Beta Beta National Biological Honors Society | Member [AUG 2020 - MAY 2022, CHAPEL HILL, NC]
UNC Office of Undergraduate Research | Research Ambassador and Mentor [AUG 2021 - MAY 2022, CHAPEL HILL NC]
UNC Daily Tar Heel | Opinion Editor and Science Columnist [AUS 2019 - MAY 2022, CHAPEL HILL, NC]
UCSD Undergraduate Bioinformatics Club | Board Member [SEPT 2018 - JUNE 2019, SAN DIEGO, CA]
UNC Hospitals | Junior Volunteer Leader [JUNE 2015 - MAR 2020, CHAPEL HILL, NC]

SKILLS
Computational - *Languages*: Python, R, Bash, Java, SAS; *Tools*: JMP, Jupyter Notebooks, Vim, RMarkdown, ImageJ, Imaris, Slidebooks, ZEN, Job Managers (SLURM), Microsoft Office Products
Experimental - Research Project Design, Scientific and Technical Writing, Conference Presentation, Scientific Literature Research Antibody Staining, Fluorescence and Confocal Microscopy, Cell and RNA isolation, Sequencing preparation