

# ELLIOT MARTIN

Bioinformatician

**Bioinformatician:** SOPHiA Genetics

**Field:** Bioinformatics, Software Development, Data Science

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## Summary

- Developed, benchmarked, documented, and released into production 15+ custom NGS pipelines for renowned hospitals and testing labs
- Solved difficult bioinformatics problems from external stakeholders
- Contributed to successful research program by establishing bioinformatics pipelines to facilitate the research of dozens of team-members
- Spearheaded a productive multi-year research project, managing and effectively communicating with several team-members from different disciplines
- Taught undergraduate courses and successfully mentored two undergraduates who achieved early medical school admittance

## Education

**Ph.D. in Biology** - University of Albany, Albany, NY

Aug. 2015 - Mar. 2022

- Dissertation Advisors: Prashanth Rangan PhD & Gabriele Fuchs PhD
- Dissertation Title: Post-transcriptional control underlies germline stem cell differentiation and entry into meiosis in the female *Drosophila*.

**Bachelor of Science, Biochemistry** - SUNY Geneseo, Geneseo, NY

Aug. 2011 - May. 2015

## Professional Experience

**Bioinformatician** - SOPHiA Genetics

Apr. 2022 - Present

- Design, release, evaluate, and document targeted gene panels and analysis pipelines to effectively identify clinically relevant genomic alterations
- Analyze and summarize various types of NGS data to clients (e.g., SNPs/INDELs, CNV, RNA fusion, and PGx alleles)
- Communicate pipeline performance results to external clinical partners

**QC Virology Bioinformatics Intern** - Regeneron Pharmaceuticals Inc.

Jun. - Aug. 2020

- Established bioinformatics pipelines for Nanopore direct RNA-seq for differential gene expression and differential isoform usage
- Developed an R Shiny application for non-bioinformaticians to process their data

**Teaching Assistant** - University of Albany

Aug. 2015 - May. 2019

- Taught basic introductory lab skills to undergraduates and distilled principles of genetics and fostered discussions on genetics and ethics

## Research Experience

**Research Assistant** - Dr. Prash Rangan & Dr. Gaby Fuchs, University at Albany

Aug. 2015 - Mar. 2022

- Examined stem cell biology by applying molecular, biochemical, and bioinformatic methods to understand the tissue specific nature of ribosomopathies
- Established bioinformatics pipelines and scripts that are utilized by non-programmers to allow dozens of team-members to rapidly process data
- Used R-Shiny to develop interactive tools to integrate RNAseq, polysome-seq, and single-cell seq data of differentiating stem cells

**Undergraduate Researcher** - Dr. Janice Lovett, SUNY Geneseo.

Sep. 2014 - May 2015

- Established bioinformatics pipelines for Nanopore direct RNA-seq for differential gene expression and differential isoform usage
- Developed an R Shiny application for non-bioinformaticians to process their data

**Research Intern** - University of Pennsylvania, Dr. Ravi Radhakrishnan

May 2014 - Aug. 2014

- Molecular modeling of cell membrane to investigate membrane curvature sensing

**Research Technician II** - University at Buffalo, Dr. Olga Baker

Dec. 2012 - Jan. 2013

- Investigated effects of Sjogren's disease on occludens junctions the salivary gland through both biochemical means and fluorescence microscopy

## Leadership and Teaching Experience

**Teaching Assistant** - University at Albany

Aug. 2015 - Mar. 2019

- Taught introductory lab skills to undergraduates
- Distilled principles of genetics and fostered discussions on genetics and ethics

**Scout Leader** - Cornesse Patro

Sep. 2010 - Aug. 2011

- Guided and supervised children with outdoor activities and games

## Skills

**Bioinformatics:** Bioinformatics pipeline development including, RNAseq, Single-cell seq, Cut and Run, Nanopore sequencing, Polysome-seq, Chromatin Immunoprecipitation sequencing (ChIP-seq) and, CAGE-seq. Sequence enrichment, dimensionality reduction, data management and aggregation, and dashboarding

**Computer Skills:** Programming languages: Adept in R, proficient with Bash, experience in C and Python Rmarkdown/Quarto,  $\LaTeX$ , R-shiny, R/Bioconductor, Linux, HPCC/AWS, version control (Git, GitLab), Microsoft Office, Adobe Photoshop, and Adobe Illustrator

**Molecular Biology:** Western blotting, immunoprecipitation (IP), qPCR, RNA/DNA purification, polysome profiling, northern blotting, cloning. Next-generation sequencing library preparation including, RNA sequencing (RNAseq), RNA immunoprecipitation sequencing (RIPseq), polysome sequencing. Certified to perform radiochemical assays and techniques

**Cell Biology:** Cell culture, RNA interference (RNAi), immunofluorescence (IF), transfection, and viral work Confocal Microscopy and Electron Microscopy (TEM & SEM)

## Publications

- Sarkar, K., Kotb, N. M., Lemus, A., **Martin, E. T.**, McCarthy, A., Camacho, J., Iqbal, A., Valm, A. M., Sammons, M. A., & Rangan, P. (2023). A feedback loop between heterochromatin and the nucleopore complex controls germ-cell to oocyte transition during drosophila oogenesis. *Developmental Cell*, 2580–2596.
- Breznak, S. M., Peng, Y., Deng, L., Kotb, N. M., Flamholz, Z., Rapisarda, I. T., **Martin, E. T.**, LaBarge, K. A., Fabris, D., Gavis, E. R., et al. (2023). H/aca snrnp-dependent ribosome biogenesis regulates translation of polyglutamine proteins. *Science Advances*, 9(25), eade5492.
- Martin, E. T.**, Blatt, P., Nguyen, E., Lahr, R., Selvam, S., Yoon, H. A. M., Pocchiari, T., Emtenani, S., Siekhaus, D. E., Berman, A., et al. (2022). A translation control module coordinates germline stem cell differentiation with ribosome biogenesis during drosophila oogenesis. *Developmental Cell*, 57(7), 883–900.
- Martin, E. T.**, Sarkar, K., McCarthy, A., & Rangan, P. (2022). Oo-site: A dashboard to visualize gene expression during drosophila oogenesis suggests meiotic entry is regulated post-transcriptionally. *Biology Open*, 11(5), bio059286.
- McCarthy, A., Sarkar, K., **Martin, E. T.**, Upadhyay, M., Jang, S., Williams, N. D., Forni, P. E., Buszczak, M., & Rangan, P. (2022). Msl3 promotes germline stem cell differentiation in female drosophila. *Development*, 149(1), dev199625.
- Emtenani, S., **Martin, E. T.**, Gyoergy, A., Bicher, J., Genger, J.-W., Köcher, T., Akhmanova, M., Guarda, M., Roblek, M., Bergthaler, A., et al. (2022). Macrophage mitochondrial bioenergetics and tissue invasion are boosted by an atossa-porthos axis in drosophila. *The EMBO Journal*, 41(12), e109049.
- LaFontaine, E., Miller, C. M., Permaul, N., **Martin, E. T.**, & Fuchs, G. (2020). Ribosomal protein rack1 enhances translation of poliovirus and other viral iress. *Virology*, 545, 53–62.
- Blatt, P., **Martin, E. T.**, Breznak, S., & Rangan, P. (2019). Post-transcriptional gene regulation regulates germline stem cell to oocyte transition during drosophila oogenesis. *Current Topics in Developmental Biology*.
- Flora, P., Wong-Deyrup, S. W., **Martin, E. T.**, Palumbo, R. J., Nasrallah, M., Oligney, A., Blatt, P., Patel, D., Fuchs, G., & Rangan, P. (2018). Sequential regulation of maternal mRNAs through a conserved cis-acting element in their 3' utrs. *Cell reports*, 25(13), 3828–3843.
- McCarthy, A., Deiluo, A., **Martin, E. T.**, Upadhyay, M., & Rangan, P. (2018). Tip60 complex promotes expression of a differentiation factor to regulate germline differentiation in female drosophila. *Molecular biology of the cell*, 29(24), 2933–2945.
- Fuchs, G., Flora, P., Wong-Deyrup, S. W., **Martin, E. T.**, Palumbo, R. J., Nasrallah, M., Oligney, A., Blatt, P., Patel, D., & Rangan, P. (2018). Sequential regulation of maternal mRNAs through a conserved cis-acting element in their 3' utrs.
- Sweeney, A. M., Fleming, K. E., McCauley, J. P., Rodriguez, M. F., **Martin, E. T.**, Sousa, A. A., Leapman, R. D., & Scimemi, A. (2017). Par1 activation induces rapid changes in glutamate uptake and astrocyte morphology. *Scientific Reports*, 7(1), 43606.

## Presentations

### Doctoral Dissertation

May 2022

"Translation Control Tunes Drosophila Oogenesis"

- Received Distinguished Doctoral Dissertation Award

### Regeneron Intern Selected Presentations: Talk

Aug. 2020

"Identification of a Biomarker Suite for Viral Infection Using Nanopore Sequencing"

### Regeneron Intern Poster Day: Poster

Aug. 2020

"Identification of a Biomarker Suite for Viral Infection Using Nanopore Sequencing"

### UAlbany RNA Retreat: Poster

Aug. 2019

"A conserved nucleolar protein acts as a ribosome concentration sensor and controls stem cell differentiation via p53 in Drosophila"

### 2019 RNA Symposium: Poster

Mar. 2019

"A conserved nucleolar protein acts as a ribosome concentration sensor and controls stem cell differentiation via p53 in Drosophila"

### UAlbany Life Science Research Symposium: Poster

Oct. 2019

"Ribosome levels regulate germline stem cell differentiation in Drosophila"

**Northeast Society for Developmental Biology (NESDB) Meeting: Poster**

"Differential Ribosome Requirement During Germline Stem-Cell Differentiation

Apr. 2018

**Life Science Research Symposium: Poster**

"Catching the baton: dual modes of RNA regulation in late oogenesis ensures establishment of the next generation

Apr. 2016