

# Eamon O'Connor

oconnor.eamon0@gmail.com

[Portfolio](#) | [LinkedIn](#) | [Github](#)

---

## EDUCATION

Northeastern University, Boston, Massachusetts

**M.S. in Bioinformatics**, May 2025

GPA 3.893

Relevant Coursework: Bioinformatics Programming, Unsupervised Machine Learning, Molecular Modeling

**B.S. in Biology**, Minor in Philosophy, June 2024

GPA 3.889

Relevant Coursework: Biostatistics, Calculus 2 & 3, Differential Equations & Linear Algebra

---

## SKILLS

**Programming Languages:** Python, R, SQL, Bash, MATLAB

**Statistics:** Hypothesis testing, ANOVA, Differential expression analysis, Data visualization (ggplot2, Matplotlib)

**Tools & Software:** AWS HPC, Git, Bioconductor, FastQC, Bowtie, STAR, Samtools, DESeq2, Nextflow, Docker

**Databases:** NCBI, Ensembl, UCSC Genome Browser

**Machine Learning:** Data mining, Clustering (DBScan, K-means), Dimensionality reduction (PCA, tSNE)

**Laboratory Techniques:** NGS, PCR, Gel electrophoresis, Western blotting, Bacterial transformation, Protein purification

---

## PROFESSIONAL EXPERIENCE

**Metaphore Biotechnologies**, Cambridge, MA

*Computational Biology Co-op*

January - June 2025

- Conducted differential expression analysis to identify receptor-specific agonists for therapeutic candidate selection
  - Collaborated with wet lab scientists to evaluate novel methods for agonist library preparation
- Performed NGS read alignment and quality control for downstream gene expression analysis
  - Assessed feasibility of sequencer-integrated pre-processing tools for use by wet lab scientists
- Compared a novel DNA ligation-based Illumina sequencing workflow against PacBio, reducing sequencing time and cost
- Debugged company-wide Nextflow pipelines to improve accuracy and computational efficiency

*NGS & Protein Sciences Co-op*

July - December 2024

- Prepared NGS libraries for Illumina and PacBio sequencers
- Synthesized and purified protein samples based on in-house experimental designs for translational research
- Analyzed protein samples using gel electrophoresis and western blots to assess purity and molecular weight
- Performed Bio-Layer Interferometry (BLI) to quantify protein concentration
- Conducted kinetics assays to evaluate binding performance and interaction strength

**Metrovet Veterinary Clinic**, Boston, MA

*Veterinary Assistant Co-op*

July - December 2023

- Recorded detailed clinical data from surgeries and medical exams for case analysis
- Processed and interpreted in-house diagnostic tests to enable data-informed treatment plans
- Assisted in the safe handling, restraint, and care of animals during medical procedures and exams

---

## RESEARCH & PROJECTS

**Microbiome-Disease Correlation Analysis**

September - December 2024

*Developed a Python program to analyze the correlation between gut microbiome composition and disease phenotypes*

- Applied Welch's t-test to assess difference in bacterial abundance between disease and healthy groups
- Integrated APIs for automated data retrieval and analysis
- Found significant negative correlation between Depression and relative abundance of Bifidobacterium in the gut

**SLE-RA Immune Heterogeneity**

March - May 2024

*Reproduced analysis of immune system signaling in systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA)*

- Analyzed immune cell communication using the R packages *Seurat* and *Cellchat*
- Visualized changes in the Migration Inhibitory Factor and Galectin-9 pathways using heatmaps and circle plots
- Identified global changes in signaling activity for both SLE and RA