Egun Im

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Education

- Boston College (2018-2022)
    - Bachelor of Science in Biology, received on May 23, 2022
    - Double concentration in Bioinformatics, and Physiology & Organismal Biology
- Choate Rosemary Hall (2014-2018)

Research Experience

- Technical Associate at Massachusetts Institute of Technology, Department of Biological Engineering – **Ernest Fraenkel Lab**

  (August 2022 – present)
    - Developed a Python pipeline for processing and quality-controlling large imaging datasets, fine-tuned the cell segmentation model using Cellpose, and optimized a CellProfiler pipeline for accurate single-cell feature extraction.
    - Investigated single-cell morphological features of iPSC-derived neurons grown under different stressor conditions with genetic knock-downs relevant to Huntington's Disease, imaged at multiple timepoints.
- Visiting Researcher at Broad Institute of Harvard and MIT – **Optical Profiling Platform / Sami Farhi Lab**

  (June 2023 – present)
    - Developed a workflow for processing raw Perturb-Seq files into count matrices, and a Python pipeline for visualizing perturbation effects for genes of interest at the single-cell level, for the autism spectrum disorder project (comparing gene expression profiles of naturally occurring genetic variants in ASD patients to genetically perturbed variants in vitro).
    - Trained in iPSC cell culture, differentiation of iPSC into neurons using NGN2 induction, lentivirus packaging, lentivirus transduction, immunohistochemistry, confocal imaging.
- Undergraduate Researcher at Dana Farber Cancer Institute, Department of Medical Oncology – **Eliezer Van Allen Lab**

  (August 2021 – June 2022)
    - Conducted bulk RNA-sequencing analysis (investigated expression of transposable elements in responders versus non-responders of immune checkpoint therapy in PanIO, pan-immunotherapy, cancer cohorts), using Python and DESeq2 package on R to conduct differential expression analysis.
    - Provided research assistance in whole exome sequencing data processing of PanIO cohorts on Terra, an omics data processing platform developed by Broad Institute of MIT and Harvard.
- Undergraduate Research Fellow at Boston College, Department of Biology – **Christopher Kenaley Lab**

  (February 2020 – May 2022)
    - Digitized skulls of the Stomiid genera to reconstruct the hard anatomy and study how the neurocranial shape has changed, and the fish have adapted physiologically in the deep-sea through different prey sizes.
    - Utilized ImageJ and Slicer to wrangle data, visualize and reconstruct micro-CT scans of skulls, as well as R to landmark and analyze morpho-space of the skulls by conducting phylogenetic principal components analysis of the genera.
- Research in Evolutionary Genomics, Boston College – Taught by **Professor Jeffrey DaCosta**

  (August 2020 – December 2020)
    - Trained in preparing samples for next-generation DNA sequencing (DNA Extraction, Adapter Ligation, PCR, SPRI bead).
    - Acquired additional Linux/Unix computational skills (command line) and became proficient with the bioinformatic pipeline and tools to be applied in managing and analyzing large data generated by sequencing technology.
- Research Intern at Boston Children's Hospital, Department of Gastroenterology – **Wayne Lencer Lab**

  (July 2021 – December 2021)
    - Trained in imaging lipids in cell membrane via STORM imaging (as well as its wet-bench preparation), then manipulating the resulting data with Python packages to detect the lipid trajectory on the cell membrane, endogenously and exogenously.

- Research Technician at Dana Farber Cancer Institute, Department of Cancer Immunology & Virology – **Carl Novina Lab**

  (February 2021 – July 2021)

  - Conducted lncRNA research – investigation of the binding partnership between CRNDE 204 isoform and a select group of proteins, involved in erythropoiesis and myelopoiesis of k562 leukemic cells.
  - Trained in experimental work (Flow Cytometry, Tissue Culture/Mammalian Cell Culture, Bacterial Culture, Transfection, Western Blotting, SDS-PAGE, REMSA, ELISA, qPCR).

- Research Intern at PCL, Inc. South Korea

  (June 2019 - August 2019)

  - Provided research assistance in developing blood screening immunoassay kits for HIV, HCV, HBV.
  - Utilized the sol-gel technology (improved from ELISA) and its characteristics to capture antibodies or antigens in the empty spaces of the silica structure for the binding of its counterpart through blood serum screening.

- Biomedical Engineering Summer Program at Columbia University - **Clark Hung** and **Chloe Bulinski**

  (July 2017 - August 2017)

  - Explored the stem cell research at greater depths about organ regeneration via in-vitro and in-vivo technology.
  - Used sol-gel technology for studying about the encapsulation of pancreatic islets, on the topic of pancreatic stem cells.

Technical Skills & Languages

- Programming Languages: Python, R, Linux (Command-line interface)
- Cloud computing: Google Cloud Platform, Terra
- Software: ImageJ, CellProfiler, Cellpose, Slicer 3D, Arduino IDE
- Languages: English, Korean, French

Teaching Experience

- Undergraduate Teaching Assistant (Boston College)
  - **Molecules and Cells** | BIOL2000 - Instructor: Laura Hake (Spring 2020-2021)
  - **Physiology** | BIOL3030 - Instructor: Christopher Kenaley (Fall 2021-2022)
  - **Ecology and Evolution** | BIOL2010 - Instructor: Jeffrey DaCosta (Spring 2021-2022)
    - For all three positions: Ran office hours for students, made practice questions for exam preparations, mentored students to be successful in class.

Abstracts & Presentations

- Listed as first author on poster titled "Skull Shape Evolution in Deep-sea Dragonfishes" - presented at Hamilton Symposium Boston College 2022, held in Chestnut Hill, MA.
  - Abstract accepted by Society for Integrative and Comparative Biology in 2021
- Listed as one of the authors on poster titled "Pooled optical, proteomic screening platform for iPSC-derived neurons for Huntington's disease research" – poster was presented at CHDI's 18th Annual HD Therapeutics Conference 2023, held in Dubrovnik, Croatia.
- Listed as one of the authors on poster titled "Pooled Multimodal Profiling in Stem Cell-Derived Neural Cells" – poster was presented at NIMH's SSPsyGene Annual Consortium Meeting 2023, held in Rockville, MD.
- Listed as one of the authors on poster titled "Multiplexed immunofluorescence in brain tissue shows spatially variable, Alzheimer's disease-associated changes in DNA damage" – poster was presented at Broad Retreat 2023, held in Boston, MA.

Awards & Honors

- National Finalist for the United States National Chemistry Olympiad, 2016
- Dean's List First Honors, year of 2021-2022 (Boston College)
- Dean's List First Honors, year of 2020-2021 (Boston College)