Baltimore, MD
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Jong M. Shin

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Education

Masters of Science and Engineering, Biomedical Engineering (GPA: 4.0/4.0) .....**August 2021**
Johns Hopkins University - Whiting School of Engineering, Baltimore, MD

Masters of Science, Physiology and Biophysics (GPA: 4.0/4.0).....**August 2018**
Virginia Commonwealth University - School of Medicine, Richmond, VA
Thesis: Role of C121A in mGluR2 homodimeric expression and function

Bachelor of Science, Biochemistry and Molecular Biology (GPA: 3.5/4.0) ..... **May 2013**
Bachelor of Science, Immunology and Infectious Diseases with a minor in **Microbiology**
The Pennsylvania State University, University Park, PA

Publications

1. *Interclass GPCR heteromerization affects localization and trafficking* (2020), Science Signaling [link]
2. *Site-Specific Incorporation of Genetically Encoded Photo-Crosslinkers Locates the Heteromeric Interface of a GPCR Complex in Living Cells* (2020), Cell Chemical Biology [link]
3. *Fully automated head-twitch detection system for the study of 5-HT2A receptor pharmacology in vivo* (2019), Scientific Reports [link]
4. *Role of mGlu2 in the 5-HT2A receptor-dependent antipsychotic activity of clozapine in mice* (2018), Psychopharmacology [link]

Manuscripts In Preparation

Reoma L.B., **Shin J.M.**, Rodriguez L.P., Boritz E., Migueles S., Burbelo P., Kovacs J., Smith B., Nath A., *Novel Effect of Pembrolizumab on HIV reservoirs in blood and CSF* **(submitted to *AIDS*)**

Shin J.M., Reoma L.B., *Post-infectious encephalitis* **(invited review submitted to *Drug Discovery Today*)**

Shin J.M. et al., Deep nets are the worst models of the mind **(in preparation with Dr. Vogelstein @ JHU)**

Professional Projects

Inductive bias experiment (JOVO Lab) [GitHub]
- Implemented ML models from sklearn and trained on nonlinear simulation data
- Generated mathmetically derived posterior probability for exclusive OR and spiral dataset
- Implemented point-wise Hellinger distance and explored the effects of extrapolation by ML models

Web application for human behavioral experiment (JOVO Lab) [GitHub]
- Developed the website for human behavioral experiment to collect inference performance
- Designed frontend using HTML/CSS/Javascript and powered backend using python (Flask, SQLalchemy)

Multivarite time-series hologram signal parsing (JOVO Lab, MindX) [GitHub]
- Cleaned and pre-processed proprietary hologram time-series datasets
- Investigated statistical significance of the signals detected from the datasets by conducting multivariate two-sample tests using in-house statistical software written in python

Glaucoma prediction using modified ResNet (Intuitive) [GitHub]
- Designed modified ResNet architecture (pretrained ResNet + convolutional net) using pytorch
- Pretrained the model with image colorization task followed by training on ophthalmological dataset to classify glaucoma and non-glaucoma from clinical retinal images

Relevant Coursework

Machine Learning – Deep Learning [JHU (EN.601.682)] | ***Artificial Intelligence*** [JHU (EN.601.664)] | ***Foundations of Computational Biology and Bioinformatics*** [JHU (EN.580.688)] | ***Neuro Data Design I/II*** [JHU (EN.580.697)] | ***Introduction to Data Science*** [JHU (EN.553.636)] | ***Applied Machine Learning*** [FAES@NIH (BIOF509)] | ***Deep Learning for Healthcare Image Analysis*** [FAES@NIH (BIOF399)]

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Experience

Graduate Research Scholar (Adviser: Joshua Vogelstein, PhD) ..... **September 2020 to Present**
Johns Hopkins University, Baltimore, MD

- Conducted experiments to explore the behaviors of extrapolation by different machine learning models
- Assisted with writing multi-million dollar grant proposals ($25M to DARPA, $20M to NSF)

Graduate Summer Engineering Intern ..... **July 2020 to September 2020**
Johns Hopkins University, Baltimore, MD

- Produced augmented image dataset from ImageNet for training iRadonMAP algorithm in MATLAB
- Learned to use cudatools for implementing various deep nets from scientific publications

Post baccalaureate IRTA research fellow ..... **May 2020 to March 2021**
National Institute on Aging, the National Institutes of Health, Baltimore, MD

- Conducted parametric/non-parametric linear regression analysis of the national omics datasets such as metabolomics and proteomics using python and R

Post baccalaureate IRTA research fellow ..... **November 2018 to April 2020**
National Institute of Neurological Disorders and Stroke, the National Institutes of Health, Bethesda, MD

- Developed a protocol for Luciferase Immunoprecipitation Systems assay in the lab to quantitatively and qualitatively assess antibody titers in the blood and CSF samples from over 300 HIV-positive patients
- Performed qPCR to construct the phylogenetic trees on clonal expansions of CD4/CD8 cells in the CSF samples from HIV-positive patients

Graduate Research Scholar (Adviser: Javier Gonzalez-Maeso, Ph.D) ..... **June 2017 to October 2018**
Virginia Commonwealth University, Richmond, VA

- Developed Magnetic Ear Tag Assay to automate rodent behavioral test (patent application submitted)
- Investigated the effect of C121A mutation of mGluR2 receptor on homodimer formation
- Performed radioligand binding assays to study membrane receptor expression and functionality of GPCR relevant to heteromer formation involved in schizophrenia
- Conducted behavioral experiments on C57BL/6 mice to study the potentiation of LY341495 on animal's head twitch response effect induced by DOI

Graduate Teaching Assistant ..... **August 2017 to May 2018**
Virginia Commonwealth University, Richmond, VA

- Given lectures in undergraduate physiology courses to 160 students for two semesters

Laboratory Specialist..... **June 2015 to Oct 2015**
The University of Virginia School of Medicine, Charlottesville, VA

- Independently managed over 200 mouse cages and produced various genetic crosses of mouse colonies to be used on histologic and behavioral studies
- Performed genotypic analysis of the transgenic mice that expresses human huntingtin's gene and ensured positive gene expression controlled by IPTG administration

Business Coordinator ..... **May 2013 to May 2015**
Mansoo Health, Annandale, VA

- Provided over 700 translations in both English and Korean
- Maintained fluent flow of the furniture retail business and provided technical support

Undergraduate Research Scholar (Adviser: Katsuhiko Murakami, Ph.D)..... **May 2011 to May 2013**
The Pennsylvania State University, State College, PA

- Performed protein purification for X-ray crystallographic structural analysis
- Worked on a research project that involves crystalizing the human mitochondrial RNA polymerase
- Presented grant-supported poster at Penn State life science undergraduate exhibition

Research Intern ..... **June 2012 to Aug 2012**
Geisinger Commonwealth School of Medicine, Scranton, PA

- Researched the effect of c-Myc inhibition on different human breast cancer cell lines
- Attended a number of medical school classes and medical science seminars

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U.S. Navy Orthopedics Technician..... **June 2008 to June 2010**
The U.S. Yokosuka Naval Hospital, Yokosuka, Japan

- Provided over 1,000 patients with casts and splints during their clinic visits, emergency room visits, and surgical procedures.

U.S. Navy Gas Turbine Systems Electrician ..... **November 2006 to June 2008**
USS John S. McCain, Yokosuka, Japan

- Operated, repaired, and performed maintenance of gas turbine engine, main propulsion machinery and control systems.

Awards and Recognition

1. Private scholarship from JOVO lab (2020) - Provision of complete tuition coverage for MSE program
2. NIH IRTA Post-bacc Research Fellowship with NINDS (2018) and with NIA (2020)
3. The Physiology and Biophysics Department Certificates of Recognition (2018)
4. Phi Kappa Phi Honor Society Academic Achievement (2018)
5. Undergraduate Exhibition in Life Science Division Grant Recipient (2011)
6. George and Elizabeth Smollett Sperling Trustee Scholarship (2011)
7. Bunton-Waller Scholarship (2011)
8. The Pennsylvania State University Dean's List (2011 – 2013)

Abstract and Poster Presentations

1. *Abstract*: C. McMahan, L. Perez, E. Horne, **J. M. Shin**, U. Santamaria, B. R. Smith, A. Nath, E A. Boritz, L. B. Reoma, Pemprolizumab treatment is associated with decreased cell-associated HIV DNA in CSF (2020).CROI
2. *Poster*: **J. M. Shin**, S. Khan, R. Kumar, J. Ling. The contribution of c-MYC to glucocorticoid regulated breast cancer cell proliferation (2012). Geisinger Commonwealth School of Medicine
3. *Poster*: **J. M. Shin**, V. Molodtsov, K. Murakami. Crystalization of the elongation complex of human mitochondrial RNA polymerase (2012). The Pennsylvania State University

Technical Skills

Programming Languages

Python, Pandas, Numpy, Scipy, Sklearn, Pytorch, Flask, MATLAB, R, HTML/CSS, Visual Basic, Java

Language Competency

English, Korean, and Japanese

Laboratory Techniques

- Mammalian and bacterial cell culture
- Nucleic acid extraction / PCR
- Genotypic analysis of mammalian tissue biopsy
- Molecular cloning / Site Directed Mutagenesis
- Luciferase Immunoprecipitation Systems Assay
- Western blot / Immunofluorescence
- Radioligand binding assays
- Mouse colony management
- Protein purification / X-ray crystallography
- RNAi gene inhibition in Drosophila model

Certificates

The R Programming Environment ..... **January 2020**
Johns Hopkins University, Coursera, Credential ID: V7W27VZPETE5

Machine Learning by Dr. Andrew Ng ..... **September 2019**
Stanford University, Coursera, Credential ID: GJLFUZY4TWTW

Premedical Graduate Health Science Certificate Program (CERT) (GPA: 4.0/4.0) ..... **May 2017**
Virginia Commonwealth University, Richmond, VA