Dennis Gong

Incoming Ph.D. Student at Harvard & MIT

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Harvard Medical School & MIT School of Engineering	Ph.D. Student in Bioengineering Health Sciences & Technology Program	Expected 2027
Johns Hopkins Whiting School of Engineering	B.S. Biomedical Engineering + Applied Mathematics & Statistics	Winter 2021

Research Experience

2018 - 2022 — Undergraduate Researcher, PI: Jordan Green, JHMI

· Project 1: Harnessed non-viral gene therapy with polymeric biodegradable nanoparticles to transfect human ASCs and promote angiogenesis. Paper below
· Project 2: Engineered properties promoting biomimicry into particle based artificial antigen presenting cells (aAPCs) such as particle stiffness and lipid coating to improve particle immunostimulatory efficiency
· Project 3: Developed machine learning models for prediction of PBAE nanoparticle transfection efficiency to reduce screening burden. Led two other undergraduates in an independent project.
· Project 4: Developed a macrophage targeted PBAE gene delivery nanoparticle for in-situ genetic engineering of tumor associated macrophages
· Project 5: Characterized PBAE nanoparticle coating strategies for ligand targeted gene delivery to immune cells in vivo

8/2020 - 8/2021 — Research Intern, PI: Stephen Meltzer, Capsulomics

· Developed prognostic risk and diagnostic classification models from methylation panel using machine learning for applications in Esophageal cancers
· Analyzed Nanopore sequencing data for esophageal cancer structural variants and differential methylation

1/2020 - 8/2021 — Design Team Leader, PIs: Dr. Youseph Yazdi & Dr. Jake Abernathy, JHH Armstrong Institute for Patient Safety

· Recruited a team of 7 other undergraduates through Covid-19 on a collaborative project with nurses and 2 clinicians at the Johns Hopkins Hospital
· Developed a syringe holder to improve intra-operative medication organization that is currently being used in operating rooms at two hospital systems
· Filed IP disclosure and established multi-center collaborations for testing

2020	SENS Summer Fellow, PI: Dr. Michael Snyder, Stanford Genetics · Analyzed GTEx proteomics and transcriptomics data to identify protein complexes related to aging
2019	Summer Research Fellow, CompBio Core, National Institutes of Aging · Analyzed SardiNIA dataset, a longitudinal clinical health trait study of 7000+ participants to characterize biomarker changes with aging through time
2017	Summer Researcher, PI: Dr. Jonathan Powell, Bloomberg~Kimmel Institute · Investigated role of serum and glucocorticoid-regulated kinase 1 (SGK1) in CD8+ T Cell differentiation

Teaching

Fall 2021	Biomedical Data Science, TA for Dr. Brian Caffo & Raimond Winslow
Fall 2021	Computational Cardiology, TA for Dr. Natalia Trayanova & Dr. Eileen Haase
Summer 2021	Biomedical Engineering Practice & Innovation, TA for Dr. Caitlin Torgerson & Dr. Jessica Dunleavey
Spring 2021	Biological Models & Simulations, TA for Dr. Aleksander Popel
Spring 2021	Biomedical Engineering Innovation, TA for Dr. Ethan Nyberg
Fall 2020	Biochemical and Molecular Engineering, TA for Dr. Eileen Haase

Publications

[1] Est Witte S, Farris A, Tzeng S, Hutton D, Parikh K, **Gong D**, Calabresi K, Grayson W, Green J. Non-Viral Gene Delivery of HIF-1α to Adipose-Derived Stem Cells to Promote Angiogenesis. *Acta Biomaterialia*. July 2020.

[2] Ma K, et al. Accurate Detection of Esophageal Squamous Cell Cancer (ESCC) Using Methylated DNA Biomarkers. *Gastroenterology.* April 2022

[3] **Gong D**, Lunz D, Stover JS, Meltzer SJ. The Clinical Utility of a Genetic Risk Test for Barrett's Esophagus. *Medicine.* *In Press

[4] **Gong D**, et al. Machine Learning Guided Structure Function Predictions Enable In-Silico Nanoparticle Screening and Improved Variants for Polymeric Gene Delivery. *Under Review

Abstracts & Presentations

[1] Lu D, Powelson S, Merz B, Nguyen C, **Gong D**, et al. Impact of a DNA Methylation-Based Assay on Gastroenterologists' Recommendations for Ablation and Surveillance Time for Risk-Stratified BE Patients: A Randomized Clinical Utility Study. *Gastroenterology*. 2022

[2] Bastakoti I, Cheng Y, Tsai HL, Arammash H, Jit S, Lu D, **Gong D**, et al. Validation of a DNA Methylation-Based Diagnostic Assay for Risk Stratification of Patients with Barrett's Esophagus. *Gastroenterology*. 2022

[3] Est-Witte S, Shannon S, **Gong D**, Tzeng S, Schneck, JA, Green JJ. Microparticle Artificial Antigen Presenting Cell Elasticity Influences Activation of Antigen-Specific T Cells. Society for Biomaterials. Baltimore, MD. 2022.

[4] Ma K, Tsai HL, Nolet C, **Gong D**, et al. Accurate Detection of Esophageal Squamous Cell Carcinoma (ESCC) Using Machine Learning with Methylated DNA Biomarkers. *American College of Gastroenterology*. 2021.

[5] Merz B, Bastakoti I, Kann L, Lu D, **Gong D**, et al. Analytical Validation of a Barrett's Esophagus Risk Stratification Methylation Assay. *American College of Gastroenterology*. 2021.

[6] **Gong D**. Machine Guided Structure Function Predictions Enable In-Silico Nanoparticle Screening for Polymeric Gene Delivery. PULSE Seminar. Baltimore, MD. 2021

[7] Lu D, Merz B, Nguyen C, **Gong D**, et al. Impact of a DNA Methylation-based Assay on Gastroenterologists' Recommendations for Risk-Stratified BE Patients: A Randomized Clinical Utility Study. American College of Gastroenterology Annual Meeting. Virtual Meeting. 2021

[8] **Gong D**, Jiang L. Aging Related Pathway Discovery Via Whole Body Transcriptomics. BMES. Virtual Meeting. 2020

[9] **Gong D**, Est Witte S, Green J. Surface and Materials Engineering for Artificial Antigen Presenting Cells. BMES. Philadelphia, PA. 2019

[10] Est Witte S, **Gong D**, Green J. Surface Engineering of a Biomimetic, Soft, Lipid-Coated, Biodegradable Artificial Antigen Presenting Cell. BMES. Philadelphia, PA. 2019

[11] **Gong D**, Kim YR, Patel C, Powell J. An Association Between SGK1 Gene Expression and CD8+ T Cell Differentiation. Maryland Junior Science Symposium. College Park, MD. 2018

Honors and Awards

2022	· National Science Foundation Graduate Research Fellowship Program Awardee
2021	· Dean's list (11/11 semesters) · Election to Tau Beta Pi · David T. Yue Memorial Teaching Award · Provost's Undergraduate Research Award · Johns Hopkins Business Plan Competition, Finalist
2020	· Summer Research Fellowship, SENS Research Foundation · Technology Fellow, Center for Educational Resources
2019	· Bisciotti Prize for Student Entrepreneurship, Fast Forward JHU
2018	· President's Environmental Youth Award, U.S. EPA · Recognition of Commitment to Public Service, Baltimore Board of School Commissioners

Skills

Computational	Python {sklearn, NumPy, Pandas, PyTorch, Matplotlib, Seaborn}, R {shiny, lme4, ggplot2, tidyverse}, bash, Git, ImageJ, Galaxy, HPC, PyMol, UGene
Biology	Mammalian cell culture, PCR, Blotting, ELISA, IHC, Flow Cytometry, RNA/DNA Harvest, transfection, cell viability assays, microscopy
Chemistry	Particle synthesis {PBAE, PEG, PLGA, LNP}, Surface chemistry and particle coating {lipopolyplex, electrostatic coatings (PGA), Mal-Thiol, EDC/NHS, biotin-avidin}, Characterization {DLS, NTA, TEM}
Animal Work	Mice handling and dissection, particle biodistribution studies, T-cell isolation

Professional Experiences

2022 — Vaccitech (Avidea Technologies), Immunology Team
· Epitope prediction analysis for immunogen design using bioinformatics
· Target identification and screening for cancer vaccine program
· Biochemical and cell characterization assays (ELISA, IHC, Flow cytometry)
· Built IHC core capabilities from ground up
· Built flow cytometry reagent server to simplify panel development workflow

2020 — Alix Ventures, Summer Venture Fellow
· Seed stage biotech VC firm based in San Francisco. Sourced deals, organized a podcast, and wrote articles. Gained an appreciation of investment preferences and trends and developments in biotech/biopharma.
· Mentored by Chas Pulido, General Partner.

2019-20 — Johns Hopkins Technology Ventures, Senior Fellow
· Patent and licensing office of Johns Hopkins. Managed a team of undergraduates, MBA candidates, and PhD students and wrote IP and market recommendations for licensing attorneys.

2018-19 — Kubanda Cryotherapy, Business Development Intern
· Seed stage startup focusing on veterinary cryosurgery. Conducted 25 stakeholder interviews and built partnerships with local hospitals for Phase 1 clinical study.
· Wrote testing protocols and automated data collection with a real-time Arduino based visualization tool.

Consulting

2022 – present — Meliora Therapeutics, Special Projects
· Seed stage discovery platform built off the work of Jason Sheltzer and Joan Smith

2022 – present — Syenex, Technical Landscaping
· Pre-seed EV delivery and therapeutics company based off the work of Josh Leonard

2022 — Third Rock Ventures, Market Landscaping
· Work done with Chris Ghadban for stealth newco

2021 – present	Longitude Capital, Therapeutics Investing · All stages venture fund focused on healthcare and life sciences with $1.8 B AUM · Take pitches, review data rooms, ad hoc special projects
2021 – 2022	Compound Venture Partners, Biotech Diligence and Research · Seed stage VC firm investing in cutting edge technology. Delivered insights to partners and advised on bio and health-tech deals
2021	Zafrens, Research and Operations · Seed stage startup focusing on RNA binding protein biology and interactions. · Conducted literature search for target ID and competitive landscaping

Service & Outreach

2022	Gilchrist, Hospice Volunteer · Certified end of life care specialist
2019-20	MedHacks, President & Co-Director · Organized an online design competition during Covid-19 for 1000+ participants with 50+ judges and volunteers and 25k in prizes
2020-21	JHU Biomedical Engineering Society, Group Mentor
2019	SNF Agora Institute for Global Democracy, Founding Student Board Member
2017-18	Baltimore Beyond Plastic, Head of Community Engagement · Youth led grassroots environmental advocacy initiative to ban polystyrene food service containers in Maryland. Testified at city and state council hearings and talked to 1000s of stakeholders. Legislation was successfully passed