Vanessa YiRan Li

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Education

Columbia University, Fu Foundation School of Engineering and Applied Sciences Expected Dec 2023
M.S. in Biomedical Engineering | GPA 4.21/4.00 New York, NY
- Concentration in Biomaterials and Tissue Engineering

Wellesley College May 2022
B.A in Chemistry (Honors) and Sociology | GPA 3.92/4.00 Wellesley, MA
- Durant Scholars Summa Cum Laude and Sigma Xi Scientific Research Honor Society

Massachusetts Institute of Technology (MIT) May 2022
Gordon-MIT Certificate in Engineering Leadership |GPA: 5.00/5.00 Cambridge, MA

Research Experience

Translational Therapeutics Accelerator (B. Fine Lab), Columbia University
Team Member Jan 2023 – Present| New York, NY
- Selected to take part in the Translational Therapeutics Accelerator Lab-to-Market Boot Camp to commercialize a STK25 inhibitor as a drug to ameliorate cardiac ischemia injury
- Conducted stakeholder interviews and market analysis to understand the heart attack market and formulate a business model for this new drug

Laboratory for Stem Cells and Tissue Engineering (G. Vunjak-Novakovic Lab), Columbia University
Research Assistant Sep 2022 – Present| New York, NY
- Model myocarditis using engineered cardiac tissues and patient antibodies to understand the underlying mechanism of this myocardial injury in systematic lupus erythematous patients
- Initiated the Women in STEM database and created science-related content (i.e. articles and videos) on the Tissue Engineering Resource Center website to make science more accessible

Y. Yoshida Laboratory, Center for iPS Cell Research and Application (CiRA), Kyoto University
Research Intern June 2022 – Aug 2022 | Kyoto, Japan
- Characterized disease phenotypes of cardiac fibrosis by evaluating key signaling pathways and biomarkers upon exposure to immunosuppressants and MAPK inhibitors
- Modeled mature human hearts by engineering iPS cell-derived multi-lineage organoids for accurate and reliable drug screening and toxicity studies

Senior Thesis at Flynn Laboratory, Department of Chemistry, Wellesley College
Independent Researcher Aug 2021 – May 2022 | Wellesley, MA
- Explored the application of water transfer printing to micropattern hydrogels onto 3-dimensional nonplanar surfaces for replicating microenvironments in the body
- Designed assays to optimize material properties and hydrogel composition as well as to visualize micropatterns with fluorescent particles

Y. Shrike Zhang Laboratory, Harvard Medical School-Brigham and Women's Hospital
Research Trainee Oct 2019 – Apr 2020 | Cambridge, MA

- Synthesized tubular hydrogel constructs with self-constructed bio-printer to model renal tubules and blood-brain barrier for applications in disease modeling
- Conceived the fabrication of glomerulus-on-a-chip and its accompanying bioreactor with microfluidic devices

R. Weiss Laboratory, Department of Biological Engineering, Massachusetts Institute of Technology
iGEM Undergraduate Research Intern Jan – Nov 2019 | Cambridge, MA

- Engineered human embryonic kidney cells to induce swarm-like chemotactic behavior in neutrophils to form immunogenic cell swarms
- Designed migration assays with Boyden chambers and fluorescent microscopy to communicate the migration index of HL-60 cells toward endogenous and transfected chemoattractants

PROFESSIONAL EXPERIENCE

Columbia University Graduate Engineering Student Affairs
Biomedical Engineering Student Ambassador Feb 2023 – Present | New York, NY

- Reviewed video interviews of MS applicants to evaluate applications for Fall 2023 entry
- Organized mentorship program between incoming and current MS students
- Represented BME master's program at informational session as well as serve as point of contact for incoming students on inquiries regarding program experience and life at Columbia

Pforzheimer Learning and Teaching Center at Wellesley College
Cafe Tutor and Accessibility Notetaker Sep 2019 – May 2022 | Wellesley, MA

- Supported student learning in introductory and organic chemistry courses by teaching sessions tailored towards the needs of each tutee with up to 20 students at a time
- Assisted students in the planning and organization of course material and study schedules to increase performance in chemistry courses

Innovating Environmental Health
Founder and Executive Director Jan 2020 – October 2021 | Wellesley, MA

- Managed 15 students in the design of low-cost air filtration devices and air quality sensors to improve the respiratory health of school children in Nepal, amassing 800+ followers on social media platforms
- Designed and delivered 6-week courses on sustainability and design thinking to 80+ students in Nepal and China as a Davis Project for Peace Grant recipient (2021)

Siemens Healthineers
Innovation Think Tank Fellow May – Jul 2021 | Shanghai, China

- Conducted 20+ hours of physician interviews and 100+ hours of research on radiography equipment in three tiers of hospitals in China
- Analyzed urine and blood analysis systems for product innovation and business modeling targeting community healthcare facilities

SurgiBox Inc., Massachusetts Institute of Technology D-Lab
Biomedical Engineering Intern Feb 2019 – Jan 2020 | Cambridge, MA

- Constructed origami-inspired air filters to increase the portability of operating-room-in-a-backpack device to unique settings around the world
- Implemented failure modes and effects analysis by coding an automated google sheets document to deploy safe surgery

PUBLICATIONS

"An Engineered Human Cardiac Tissue Model Reveals Contributions of Systemic Lupus Erythematosus Autoantibodies to Myocardial Injury." *In Preparation.*

"Immunosuppressants Tacrolimus and Sirolimus revert the cardiac antifibrotic properties of p38-MAPK inhibition in 3D-multicellular human iPS-heart organoids." Y. Tian, Y. Tsujisaka, **V.Y. Li**, K. Tani, A. Lucena-Cacace, and Y. Yoshida. Frontiers in Cell and Developmental Biology. November 11, 2022.

"Water Transfer Printing: Hydrogel Micropatterning of Complex 3-Dimensional Surfaces for Biological Applications." **V.Y. Li** and N. Flynn. Wellesley College Digital Depository. 2022.

"The Glomerulus: A Review on Current Biomimetic Models." M.G. Valverde, L.S. Mille, K. Figler, E. Cervantes, **V.Y. Li**, J. Bonventre, R. Masereeuw, Y.S. Zhang. Nature Reviews Nephrology. January 21, 2022.

"The Directed Migration of Neutrophil-Like Cells Through Engineered Chemokine Secretion." **YiRan Li**, Melody Wu, Margaret Zhang, Nika Shakiba, Shiva Razavi, Ron Weiss. MIT Undergraduate Research Journal Volume 38. Fall 2019.

PRESENTATIONS

"Understanding myocardial injury with clinical systolic dysfunction in systemic lupus erythematosus patients using iPSC-derived engineered cardiac tissues." S. Fleischer, T. Nash, M. Tamargo, R. Lock, G. Venturini, M, Morsink, **V. Y. Li**, M. Lamberti, P. Graney, M. Liberman, Y. Kim, R. Zhuang, J. Whitehead, R. Friedman, R. Soni, J. Seidman, C. Seidman, L. Geraldino-Paradilla, R. Winchester, G. Vunjak-Novakovic. Poster presentation at the Columbia Summer Research Symposium. New York, NY. July 26, 2023.

"Disease Pathway: Wound Healing Disorder." External Innovation Think Tank Exhibition. July 28, 2021.

"Innovating Environmental Health: Providing Clean Air to Children through Collaborative Engineering and Education." **V.Y. Li.** Social Impact Lab Presentation at the Unite for Sight Global Health and Innovation Conference. April 10, 2021.

"Innovating Environmental Health: Building Air Filtration Devices to Clean the Air in Nepali Secondary Schools." **V. Y. Li,** S. Sedhain, B. Mandal, B. Y. Li. Poster presentation at the 12th Annual Consortium of Universities for Global Health Conference. March 21, 2021.

AWARDS AND HONORS

Sigma Xi Grants in Aid of Research Recipient (June 2023): Awarded 1000 USD to study the electrical and metabolic maturation of engineered cardiac tissues in the Vunjak-Novakovic Lab

Summer at SEAS Fellowship (March 2023): Awarded 6000 USD to conduct summer research in the School of Engineering and Applied Sciences at Columbia University

BostInno's 25 Under 25 Honoree (September 2021): Selected as one of Massachusetts' 25 young innovators under the age of 25 by digital media and events company BostInno

Davis Project for Peace Grant 2021 Recipient (June 2021): Awarded 10,000 USD to improve the air quality for children in Nepal as nominated by Wellesley College and selected by the Davis Foundation

Social Innovation Warehouse Global Fellow (February 2021): Selected to take part in a 5-week capacity-building program for young innovators to grow their social innovation projects

Albright Institute of Global Affairs Fellow (January 2021): Selected as one of 40 Wellesley Students, guided by Secretary M. Albright, to engage in global leadership seminars with the goal of bridging education and practice

Introductory Chemistry Award (April 2020): Awarded for outstanding performance in an introductory chemistry course at Wellesley College

International Genetically Engineering Machine Gold Medal (November 2019): Awarded to teams who have shown excellence in key pillars of an iGEM project as a part of the MIT iGEM team at R. Weiss Laboratory

LEADERSHIP EXPERIENCE

Interschool Chair and Lead Department Representative, Columbia Engineering Graduate Student Council (Sep 2022 – Present) – Organize social/networking events between different schools at Columbia to foster interdisciplinary 21st century discussions

Founder and Co-Editor in Chief, Wellesley Undergraduate Research Journal (Sep 2020 – May 2022) – Launched biannual peer-reviewed journal to showcase multidisciplinary research at Wellesley College, providing an opportunity for students to undergo the peer-review process

Technology Lead, MIT Hacking Medicine (May 2019 – May 2022) – Managed event hosting 400+ participants around the world to address medicine, COVID, and racism to foster an innovative ecosystem that solves healthcare problems worldwide

President and Project Manager, Wellesley Engineering Society (Oct 2018 – May 2022) – Initiated 3D-printed e-NABLE prosthetics project, Design for Social Change Ideation, and Wellesley in Minecraft project to diversify the engineering community at Wellesley

COMMUNITY OUTREACH

Event Organizer, Columbia BME Diversity, Equity, and Inclusion Committee (Jan 2023 -Present) – Organize speaker events and social media content to celebrate women's history month at Columbia University with the goal of increasing the visibility of women-identifying scientists

Social Media Manager, Health Tech Without Borders (Nov 2022 – Present) – Create social media posts to raise awareness for the humanitarian emergency in Ukraine and to leverage telemedicine to provide immediate access to health resources, garnering 40,000+ impressions on published posts

HYPOTHEKids, Maker Lab Instructor (July 2023) – Designed and taught a computational biology curriculum to underserved high school students in New York interested in STEM

Research and Advocacy Volunteer, The Family Van (Sep 2021 – Dec 2021) – Engaged in research on mobile health clinics around the United States as well as compiled healthcare data and resources to bring mobile health services to vulnerable populations in greater Boston

Health Partnerships Coordinator, Boston Healthcare for the Homeless (Sep 2019 – May 2021) – Led community-based learning and reflection for volunteers at Boston Healthcare for the Homeless and organized games/music concerts for the residents