

Anjali Gopal

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Education

- 2015–Present **Ph.D. Candidate, Bioengineering**, *University of California, Berkeley*, Berkeley, CA, GPA 3.9/4.0, (expected graduation: May 2021).
Working thesis: “Engineering Principles for High-Dimensional Single-cell Electrophoretic Cytometry”
Advisor: Prof. Amy E. Herr
- 2009–2014 **Bachelor of Applied Sciences, Honours Nanotechnology Engineering (Co-op)**, *University of Waterloo*, Waterloo, ON, GPA 92/100.
Graduated with Distinction, Dean’s Honours List

Research & Work Experience

- Sept. 2015 **Graduate Student Researcher**, *University of California, Berkeley*, Berkeley, CA.
– Present
 - Investigating progression and resistance mechanisms of HER2 isoforms in HER2+ breast cancer via simultaneous single-cell proteoform and RNA sequencing measurements.
 - Investigating image segmentation algorithms for quantification of low-abundance protein isoforms in single-cell cytometry data.
 - Investigated multiplexing procedures for single-cell electrophoretic cytometry via chemical stripping.
 - Assisted in deep learning pipeline development to automate cytometry quantification.
 - Students mentored:** Mr. Alden Moss, Ms. Preethi Bhat, Mr. Kunal Kapoor
- Jun. 2014 **Research Assistant**, *University of Toronto*, Toronto, ON.
– Jul. 2015 Dr. Frederick Roth Research Laboratory
 - Designed a pipeline for processing NGS data from *S. cerevisiae* samples
 - Streamlined variant calling, using Bowtie/Bowtie-2 & SAMTools
 - Developed a front-end web interface to display and visualize data output.
 - Cultured and analyzed basic yeast strains for Yeast Two-Hybrid analysis.
- May 2013 **Research Assistant**, *University of Waterloo*, Waterloo, ON.
– Aug. 2013 Advanced Miniaturization Laboratory, Dr. Chris Backhouse Group
 - Investigated temperature dependence of Rhodamine-B fluorescence.
 - Developed software to test & control various microfluidics modules (PCR, Capillary Electrophoresis, peristaltic pump) via Labview.
- Sept. 2011 **Engineering Assistant**, *Baylis Medical Company*, Mississauga, ON.
– Apr. 2012 Cardiology/Radiology Research & Development Team
& Jan. 2011
 - Created & tested prototypes to investigate echogenicity of radiofrequency guidewires.
 - Performed statistical analysis of physical properties (stiffness, leakage) of new catheter models.
 - Verified integrity of prototypes by performing testing according to ISO standards
 - Created & maintained technical documents (device history files, manufacturing files, etc.)

Teaching Experience

- Fall 2019 **Teaching Assistant, BioE 192 Senior Design Capstone**, *University of California, Berkeley*, Berkeley, CA.
 - Mentored > 36 students in individual projects, and 4-5 person senior capstone projects.
 - Taught and organized Arduino rapid electronics prototyping workshop.

- July 2018 **Teaching Assistant, Single-cell Analysis Course**, *Cold Spring Harbor Laboratory*,
& July 2019 Long Island, NY.
- Taught "single-cell western blotting" module (including engineering theory, wet lab, and data analysis) to 20 graduate students and postdocs in a four-day intensive course.
 - Organized reagents, equipment, and processes for a remote 'teaching' laboratory.

Publications

1. **A. Gopal** & A. E. Herr, "Reconstruction of t-erbB2 Isoform Formation via Simultaneous Single-cell Proteoform and RNA Sequencing Measurements", (*in preparation*).
2. **A. Gopal**, & A.E. Herr, "Principles for Segmentation-Based Quantification of Single-Cell Separations", (*in preparation*).
3. A. Su*, S.M. Grist*, A. Geldert, **A. Gopal**, & A.E. Herr, "UV-C decontamination for N95 emergency reuse: Quantitative dose validation with photochromic indicator", medRxiv, 2020 (*pre-print*).
4. **A. Gopal** & A. E. Herr, "Multiplexed In-Gel Microfluidic Immunoassays: Characterizing Protein Target Loss During Reprobing of Benzophenone-Modified Hydrogels", *Scientific Reports*, 2019.
5. E. Petsalaki, A. Helbig, **A. Gopal**, A. Pasculescu, F.P. Roth & T. Pawson, "Selphi: Correlation-based Identification of Kinase-associated Networks from Global Phospho-proteomics Datasets", *Nucleic Acids Research*, **2015**, 43(W1):W276-82.

Conference Presentations & Posters

1. **A. Gopal** & Amy. E. Herr, "Design Principles of Multiplex Target Detection in Hydrogels via Chemical Stripping", *SciX 2019*, Palm Springs, CA, October 2019 (**3rd place poster award**).
2. **A. Gopal** & A. E. Herr, "Towards Reconstruction of t-erbB2 Isoform Formation via Simultaneous Single-cell Proteoform and RNA Sequencing Measurements", *UC Berkeley/UCSF Joint Graduate Program in Bioengineering Retreat*, 2019.
3. **A. Gopal** & A. E. Herr, "Investigating the Impact of Denaturing Detergents in Protein/Hydrogel Systems", *UC Berkeley/UCSF Joint Graduate Program in Bioengineering Retreat*, 2018 (invited talk).
4. **A. Gopal** & A. E. Herr, "Investigating the Impact of Denaturing Detergents in Protein/Hydrogel Systems", *Microtechnologies in Medicine and Biology*, 2018.
5. E. T. Goossens, J. Vlassakis, **A. Gopal**, A. E. Herr, & R.W. Doerge, "A semi-supervised framework for classification and segmentation of electrophoretic cytometry images", *NIPS Molecular Biology Workshop*, 2017.
6. **A. Gopal** & A. E. Herr, "Investigating Immunoassay Sensitivity Limitations of Electrophoretic Protein Cytometry", *UC Berkeley/UCSF Joint Graduate Program in Bioengineering Retreat*, 2017.
7. **A. Gopal** & A. E. Herr, "Multiplex Protein Cytometry via Chemical Stripping", *UC Berkeley/UCSF Joint Graduate Program in Bioengineering Retreat*, 2016.

Awards

- 2018 Lewis Scholar, *University of California, Berkeley*
- 2016 NSERC PGS-D Fellowship, *Natural Sciences & Engineering Research Council of Canada*
- 2014 Paula Plummer Award, Engineering Society, *University of Waterloo*
- 2013 Debate Award, Sandford Flemming Foundation, *University of Waterloo*
- 2012 First Place, NanoCarbon Cellulose Design Competition, *University of Waterloo*
- 2012 Karen Mark Award, Sandford Flemming Foundation, *University of Waterloo*
- 2011 Faculty of Engineering Upper Year Scholarship, *University of Waterloo*
- 2011 Iron Pen Award, The Iron Warrior Engineering Newspaper, *University of Waterloo*
- 2010 C. D. Howe Memorial Foundation National Engineering Award, *Association of Universities and Colleges of Canada*
- 2009 Paul B. Spafford Entrance Scholarship, *University of Waterloo*
- 2009 President's Scholarship of Distinction, *University of Waterloo*
- 2009 Excellence Award, *Canada Millennium Scholarship Foundation*

Leadership Experience & Volunteering

- Mar. 2020 **Contributing Member, N95decon.org**, Berkeley, CA.
 - Present *N95decon.org is a consortium of 100+ scientists, engineers, and physicians to create evidence-based reports on critical decontamination methods for N95 filtering facepiece respirators.*
 - Utilized engineering design principles to identify key personal protective equipment (PPE) decontamination needs in medical facilities, in response to Covid-19 pandemic.
 - Identified key technical specifications, safety considerations, and sterile processing workflow requirements for UV-C decontamination of N95 face-filtering respirators.
- Jan. 2018 **Admissions Committee, Bioengineering**, *University of California, Berkeley*, Berkeley, CA.
 - Jan. 2019
 - Worked with 20 faculty members and 9 Ph.D. students to identify top Ph.D. applicants for interview from a pool of 700+ applicants.
- May 2016 **Volunteer Coordinator, Effective Altruism Global**, *Center for Effective Altruism*, Berkeley, CA.
 - Aug. 2016
 - Recruited, hired, and mentored a team of 50 volunteers to ensure smooth operation of conference with 1000+ attendees.
 - Created a detailed schedule of conference programming for volunteer shifts.
 - Maintained regular communication with the conference curator, director of programming, community coordinator, assistant producers, and other volunteers.
- Nov. 2015 **Co-Chair, Bioengineering Visit Weekend Committee**, *University of California, Berkeley*, Berkeley, CA.
 - Nov. 2017
 - Organized 2 interview weekends for 75+ prospective students of the UCB/UCSF Bioengineering program.
 - Facilitated networking events between prospective & current students, and faculty.
- Nov. 2015 **Co-organizer, Bioengineering Retreat Committee**, *University of California, Berkeley*, Berkeley, CA.
 - Nov. 2017
 - Organized 2 department-wide retreats for a group of 150+ graduate students and 30+ faculty members.