

Aditi Swarup

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Summary

MCHRI scholarship funded Postdoctoral Scholar at Stanford University with a PhD in Cell Biology and Regenerative Medicine

Highly motivated with 13+ years of research experience

Analytical thinker with excellent interpersonal and communication skills

Education

- **Thomas Jefferson University** **Philadelphia, PA**
Ph.D. Candidate, Department of Cell Biology and Regenerative Medicine *Sept 2014 – Feb 2019*
PI: Dr. Nancy J. Philp

 - **Thesis:** Deletion of GLUT1 from ocular epithelium leads to cataract formation and photoreceptor degeneration in mice
 - Investigated metabolic dysregulation in ocular tissue using in vivo transgenic mouse models
 - Established that deletion of GLUT1 in the retinal pigment epithelium leads to photoreceptor degeneration
 - Identified GLUT1 as the most essential glucose transporter in the lens epithelium
 - Demonstrated that the deletion of GLUT1 in the lens epithelium leads to cataract formation in mice
 - Developed a novel method for using SD-OCT to image cataracts in the mouse lens
- **University of Delaware** **Newark, DE**
M.ChE. Candidate, Department of Chemical and Biomolecular Engineering *Sept 2008 – May 2010*
PI: Dr. Maciek R. Antoniewicz

 - **Thesis:** Reconstruction and analysis of central carbon metabolism of thermophilic bacteria for Biofuels Applications
 - Developed a cell culture protocol for the thermophilic bacteria, *Thermus thermophilus* HB8, in custom designed miniature bioreactors
 - Created and validated a metabolic network model for thermophilic bacteria using ¹³C tracer (stable isotope) studies employing Gas Chromatography-Mass spectrometry.
 - Successfully produced ethanol by fermentation using thermophilic bacteria with glucose as the sole substrate
- **Manipal Institute of Technology** **Karnataka, India**
BE, Department of Chemical Engineering *Aug 2004 – May 2008*

Fellowships

- Maternal and Child Health Research Initiative (MCHRI) Postdoctoral Scholarship funding for year 2022-2023.

Experience

- **Stanford University** **Palo Alto, CA**
Postdoctoral Scholar, Department of Ophthalmology *April 2019 – Present*
PI: Dr. Albert Y. Wu

 - Conducted limbal stem cell grafting on mouse ocular injury models
 - Generated corneal organoids from induced pluripotent stem cells (iPSC) to study differences in gene expression during organoid development using single cell RNAseq.
 - CRISPR-edited iPSCs to create and study diseased corneal organoids
 - Developed tissue dissociation protocols and analysed data using Seurat pipeline for single-cell RNAseq (scRNAseq) of the human eye in collaboration with the Chan Zuckerberg Biohub as part of Tabula Sapiens Consortium

- Created patient derived iPSCs from skin tissue fibroblasts for ocular disease analysis
- Developed animal models of symblepharon (ocular conjunctival inflammation and fibrosis) after chemical injury and tested hydrogels as a therapeutic
- Trained PhD and medical students on organoid creation from iPSCs and single cell analysis
- Collaborated on several projects with other academic labs and industry

- **Biotech Connection Bay Area (BCBA)**

Strategy Consultant (Volunteer)

Palo Alto, CA

March 2020 – June 2020

- Worked with a Bay Area StartUp to identify amenable ocular indications and optimize their disease platform. Worked in an interdisciplinary team of 6 postdoctoral and graduate students from Stanford University, UC Berkeley and UCSF

- **Thomas Jefferson University**

Research Assistant III, Department of Pathology, Anatomy and Cell Biology
PI: Dr. Jan Hoek

Philadelphia, PA

Aug 2010 – Aug 2014

- Developed cell culture techniques for hepatocytes in vitro and investigated their metabolism using GC/MS

Selected Publications (Citations on Google Scholar: 805)

- **Swarup A**, Phansalkar R, Morri M, Agarwal A, Subramaniam V, Li B, Wu AY. Single-cell transcriptomic analysis of corneal organoids during development. *Stem Cell Reports*, November 2023
- Youn GM, Case AG, Jarin T, Li B, **Swarup A**, Naranjo A, Bou-Khalil C, Yao J, Zhou Q, Hom ME, Rosenthal EL, Wu AY. The Use of Panitumumab-IRDye800CW in a Novel Murine Model for Conjunctival Squamous Cell Carcinoma. *Translational Vision Science and Technology*, July 2022
- The Tabula Sapiens Consortium and **Swarup A**(as part of the eye group). The Tabula Sapiens: A multiple-organ, single-cell transcriptomic atlas of humans. *Science*, May 2022
- Volperian SK, et al. and **Swarup A**(as part of Tabula Sapiens Consortium). Cell types of origin in the cell-free transcriptome. *Nature Biotechnology*, February 2022
- **Swarup A**, Grosskopf AK, Stapleton LM, Subramaniam VR, Li B, Weissman IL, Appel EA, Wu AY. PNP Hydrogel Prevents Formation of Symblephara in Mice After Ocular Alkali Injury. *Translational Vision Science and Technology*, February 2022
- Olivieri JE, et al. and **Swarup A**(as part of Tabula Sapiens Consortium). RNA splicing programs define tissue compartments and cell types at single cell resolution. *eLife*, September 2021
- The Tabula Microcebus Consortium, and **Swarup A**(as part of Tabula Microcebus Consortium). Tabula Microcebus: A transcriptomic cell atlas of mouse lemur, an emerging primate model organism. *BioRxiv preprint*, December 2021 (submitted to Nature)
- **Swarup A**, Ta C, Wu AY. Molecular mechanisms and treatment for ocular symblephara. *Survey of Ophthalmology*, May 2021
- **Swarup A**, Wu A. Orbital Fractures: Principles, Concepts and Management. *Ophthalmic Plastic and Reconstructive Surgery*, August 2020
- **Swarup A**, Suchy F, Bhadury J., Subramaniam V., Nakauchi H., Wu A. (2019). CRISPR-blastocyst complementation: A novel technique to study ocular disease pathogenesis. *Poster at Stanford MCHRI, Palo Alto, CA*
- Grenell A, Wang Y, Yam M, **Swarup A**, Dilana T, Hauer A, Linton J, Philp NJ, Gregor E, Zhu S, Shi Q, Murphy J, Guan T, Lohner D, Kolandaivelu S, Ramamurthy V, Goldberg A, Hurley J, Du J. Loss of MPC1 reprograms retinal metabolism to impair visual function. *PNAS*, February 2019
- **Swarup A**, Samuels IS, Bell B, Han J, Soto J, Abel ED, Peachey NS, Philp NJ. Modulation of GLUT1 expression in the RPE impacts outer segment renewal and results in photoreceptor degeneration. *American Journal of Physiology*, Nov 2018
- **Swarup A**, Bell B, Du J, Han J, Soto J, Abel ED, Bravo A, Fitzgerald P, Peachey NS, Philp NJ. Deletion of Glut1 in mouse lens epithelium leads to cataract formation. *Experimental Eye Research*, March 2018

- Cordova LT*, Cipolla RM*, **Swarup A***, Long CP, Antoniewicz MR. ¹³C metabolic flux analysis of three divergent extremely thermophilic bacteria: Geobacillus sp. LC300, Thermus thermophilus HB8 and Rhodothermus marinus DSM 4252. (* Authors contributed equally) *Metabolic Engineering*, November 2017
- Juskeviciute E, Dippold RP, Antony AN, **Swarup A**, Vadigepalli R, Hoek JB. Inhibition of mir-21 rescues liver regeneration after partial hepatectomy in ethanol-fed rats. *American Journal of Physiology*, November 2016
- Correnti JM, Cook D, Aksamitiene E, **Swarup A**, Ogunnaike B, Vadigepalli R, Hoek JB. Adiponectin fine-tuning of liver regeneration dynamics revealed through cellular network modelling. *The Journal of Physiology*, January 2015
- Correnti JM, Juskeviciute, **Swarup A**, Hoek JB. Pharmacological ceramide reduction alleviates alcohol-induced steatosis and hepatomegaly in adiponectin knockout mice. *American Journal of Physiology-Gastrointestinal and Liver Physiology*, January 2015
- **Swarup A**, Lu J, DeWoody K, Antoniewicz MR. Metabolic Network Reconstruction, growth characterization and ¹³C metabolic flux analysis of the extremophile Thermus Thermophilus HB8. *Metabolic Engineering*, July 2014

Conference Talks and Posters

Conference talks

- **Swarup A**, et al. Deletion of GLUT1 in mouse lens epithelium leads to cataract formation. *Invited speaker at International Conference on the Lens, Kona, Hawaii, 2017*
- **Swarup A**, et al. Modulation of GLUT1 in the RPE impacts OS renewal and results in photoreceptor degeneration. *ARVO, Honolulu, Hawaii, 2018*
- **Swarup A**, et al. Deletion of GLUT1 in lens epithelium leads to cataract formation. *ARVO, Baltimore, MD, 2017*

Posters

- **Swarup A**, Suchy F., Bhadury J., Subramaniam V., Nakauchi H., Wu A. (2019). CRISPR-blastocyst complementation: A novel technique to study ocular disease pathogenesis. *Stanford MCHRI, Palo Alto, CA*
- Samuels, I. S., **Swarup A**, Beight, C., Han, J. Y., Soto, J., Abel, E. D. D. & Philp, N. J. (2017). Loss of GLUT1 in the RPE does not diminish its function, differentiation or polarity. *ARVO, Baltimore, MD*
- Dhingra, A., Reyes-Reveles, J., Alexander, D., Sharp, R. C., **Swarup A**, Kim, H. J. & Boesze-Battaglia, K. (2017). Microtubule-associated protein 1 light chain 3 (LC3) isoforms in RPE: expression and function. *ARVO, Baltimore*

Awards

- Young Investigator Travel Award from The National Foundation of Eye Research to attend The International Conference on the Lens 2018, Kona, Hawaii
- JCBS Travel Fellowship consecutively for 2017 and 2018 to give oral presentations at the Association for Research in Vision and Ophthalmology (ARVO) in Baltimore, Maryland and Honolulu, Hawaii