Amy Fox

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Education

Colorado State University, Fort Collins, CO — August 2017 – Present
PhD in Microbiology, Immunology, Pathology
GPA: 4.0/4.0

Rice University, Houston, TX — August 2013 – May 2017
Bachelor of Science in Bioengineering
GPA: 3.3/4.0

Projects

Colorado State University, Henao-Tamayo Lab, Fort Collins, CO
Automating Flow Cytometry Analysis — August 2017 – Present

- Created analysis pipeline for analyzing flow cytometry data that feature engineers 10,000 cells per second.
- Validated pipeline with additional datasets including murine splenocytes and human whole blood
- Published paper in Scientific Reports describing the method

Colorado State University, Santangelo Lab, Fort Collins, CO
Automating Nanostring Analysis — July 2019 – October 2019

- Built analysis pipeline that performs automated statistical analysis for Nanostring data: reads in and cleans the data that contains hundreds of genes per study animal
- Tested each gene-mouse group pair for normality, similar variances, and then performing the appropriate statistical test (t-test or Wilcox Mann-Whitney)
- Reduced analysis time per experiment from 1 week to under 1 minute

Rice University, Department of Bioengineering, Houston, TX
Smart Compression Sock — August 2016 – May 2017

- Elected as team leader for a group of 5 students tasked with developing a smart compression sock to treat chronic venous disorders
- Developing design ideas, proposals, and presentations to sponsors and faculty advisors
- Submitted a patent for the lace-tension control design

Rice University, Department of Anthropology, Houston, TX
An Experimental Evaluation of Gar Scale Arrow Points — August 2015 – January 2016

- Performed a literature search on gar scales at archaeological sites in the United States
- Modified 10 gar scales with abrasive techniques and shot them at a target using a calibrated cross bow
- Assessed the damage of the gar scales and determined that alligator gar scales can be easily modified and utilized as tips for projectile weaponry

Experience

Mycobacteria Research Laboratories, Colorado State University — August 2017 – Present
Research Advisor: Dr. Marcela Henao-Tamayo
PhD Candidate

- Develop R-based data analysis pipeline for flow cytometry data
- Characterize cellular immune response to candidate *Mycobacterium tuberculosis* vaccines through flow cytometry
- Collaborate with labs to build statistical pipeline for gene expression analysis

Testmasters, Houston, TX — December 2016 – July 2017
Instructor

- Instructed classes of 30 students in 3-hour SAT and ACT math and science courses
- Tutored individual students on mathematical skills and testing strategies to help improve their scores on standardized tests

Baylor College of Medicine, Texas Children's Hospital
Research Advisor: Dr. Job Lopez August 2015 – May 2017
Project Intern

- Assessed murine exposure to *Borrellia turicatae* via western blots
- Optimized ELISAs for use in prevalence study of murine exposure to *Borrelia* in Panama and in determining if pigs develop antibodies against tick saliva
- Extracted DNA from ticks and perform PCR to determine if ticks are infected with *Borrelia*
- Trained to work with mice and dissect ticks for salivary gland extracts

Bioscience Research Collaborative, Rice University January 2014 – April 2015
Administrative Assistant

- Compiled information from literature searches to update faculty research highlights
- Managed book orders for 26 graduate students

Publications

1. **Fox A,** Dutt T, Karger B, Obregon-Henao A, Anderson B, Henao-Tamayo M. Acquisition of High-Quality Spectral Flow Cytometry Data. *Current Protocols in Cytometry.* 2020; 93(1).
2. **Fox A**, Dutt T, Karger B, Rojas M, Obregon-Henao A, Anderson B, Henao-Tamayo M. Cyto-feature engineering: A pipeline for flow cytometry analysis to uncover immune populations and associations with disease. *Scientific Reports.* 2020; 10.
3. Costa A, **Fox A.** An Experimental Evaluation of Gar Scale Arrow Points. *Journal of Houston Archeological Society.* 2016;136: 23-31.
4. Bermúdez S, Gottdenker N, Krishnvajhala A, **Fox A**, Wilder H, Gonzalez K, Smith D, Lopez M, Perea M, Rigg C, Montilla, S, Calzada J, Saldaña A, Caballero C, Lopez J. Synanthropic mammals as potential hosts of tick-borne pathogens in Panama. *Plos One.* 2017; 12(1).

Posters, Awards, Patents

2016 Eighth Annual Elevator Pitch Competition: **1st Place**
2016 Eighth Annual Elevator Pitch Competition: **People's Choice Award**
2017 Brown School of Engineering Design Showcase and Post Competition: **Poster Presentation**
2017 Brown School of Engineering Design Showcase and Poster Competition: **People's Choice Award**
2017 Rice University Bay Area Showcase: **Poster Presentation**
2017 Rice University Bay Area Showcase: **Most Investable Design Award**
2017 Adjustable Compression Sock: **Patent Pending**
2019 Colorado State University Microbiology, Immunology, and Pathology: **Travel Grant**
2019 Keystone Symposia: Tuberculosis: Mechanisms, Pathogenesis and Treatment: **Poster Presentation**
2019 20th Annual CVMBS Research Day: **Poster Presentation**
2019 CMB, MCIN, BMB, TOX Research Symposium: **Poster Presentation**
2019 National Science Foundation: **Gaussi Fellowship**
2019 Cytek Group User Meeting: **Travel Award**
2019 Cytek Group User Meeting: **Oral Presentation**
2019 Cyo 2019: **Poster Presentation**
2019 Cyto 2019: **Outstanding Poster Award**
2020 21st Annual CVMBS Research Day: **Oral Presentation**
2020 21st Annual CVMBS Research Day: **2nd Place in Basic Science Oral Presentation**
2020 Front Range Computational & Systems Biology Symposium: **Poster Presentation**

Extracurricular Activities

MIP Graduate Student Organization August 2017 – Present
President – Technology Officer

- Apply for internal Colorado State University grants for exploring alternative careers and mentoring
- Invite speakers from the government, local biotechnology start-up companies, and universities to share their reseach

Graduate Women in Science September 2017 – Present

VP of Engagement – National Liaison – Outreach Chair

- Partner with local girl scout troop to help 20 students receive STEM-related badges
- Develop curriculum to teach science classes at a local middle school

Science Olympiad at Preston Middle School August 2017 – December 2017

- Instructed students in two topics: Crime Busters and Potions & Poisons
- Co-coached two nationally competitive teams

Rice Club Sailing Team August 2013 – May 2017

President

- Coordinated and scheduled weekend practices and regattas with coaches, Lakewood Yacht Club, and members
- Orchestrated Rice's first regatta with schools from across the nation

Rice Women's Waterpolo August 2013 – May 2017

Treasurer

- Managed collection of yearly dues and reimbursement of money for travel
- Recorded expenditures throughout the year

Volunteers Around the World August 2015 – June 2016

- Fundraised $2,000 for medications and supplies to distribute in Peru
- Performed triage, measured vital statistics, and managed a pharmacy in plazas throughout Cusco providing free medical care for 200 people per day
- Taught a class on nutrition and exercise at an orphanage