

RACHEL SOO HOO SMITH

BIOMEDICAL ENGINEER, B.S. & ENTREPRENEUR

Co-founder and **engineer** of two-year project to develop and bring to market a novel phage-based diagnostic and biomarker. I have strong technical expertise in synthetic biology and wet lab technique, as well as nano- and micro- biosensor design. I secured over \$280,000+ in funding, and enjoy operating in scientific, business, and design spheres. I communicate well to technical and lay audiences, have a strong sense of self-starting, and enjoy revving people up about the potency of their own ideas. I want to radically anticipate future possibilities, as I am never one to turn down adventure into the uncharted!

Technical Skills Include: General Bacteriology (BSL2), Biochemistry, and Genetics. Maintain Bacteria Culture and Phage Stock, Titration/Amplification, PCR, DNA Isolation/Manipulation, Mutagenesis and Homologous Recombination Technique, Protein Synthesis/Purification, Immunoassay Development, Western Blotting, Electrophoresis, DNA Hybridization Probing, Immunofluorescent Visualization, and Murine Biodistribution.
Bio-Sensor Fabrication, Breadboarding, Materials Selection, Rapid Iterative Prototyping, and Presentation of Process.

EXPERIENCE - VENTURES

PhageFlag

Charlottesville, VA

Spring 2013 - 2015

Inventor, Founder and Researcher.

Supported and Incubated within UVA BioMed Eng Dept.-Coulter Translational Research Foundation

Early venture to create a bacterial diagnostic, as rapid, assessable, and ease-to-use as a pregnancy test.

Stemming from iGEM 2012 work, the genetic cassette created inserts modularly into different viral vectors, and can trigger a store-bought LF tests towards specified infectious diseases. **Funding acquisition, \$200K.**

- Epitope mapped a protein to identify Ab binding sites, and engineered a novel, synthetic protein signal for the test; additionally, versatile for *in vivo* biomarker applications (e.g. cancer screening)
- Developed system to isolate successfully engineered phage, after homologous recombination.

Research Partner: Alex Zorychta, **Business Partner:** Shaun Moshasha.

PIs: Erik Hewlett, MD., John Herr, Ph.D., Kimberly Kelly, Ph.D. *Publication/Provisional patent pending.*

Business Accomplishments:

NSF Innovation Corps (I-CORPs, D.C.), Short-term

Spring 2015

National Science Foundation intensive commercialization and customer discovery program.

Coulter Report: Rapid Pathogen Testing in the Meat Industry

Spring 2015

Submitted, report compiling market knowledge and data analysis of +80 interviews in industry.

Business Pitch Competitions: The UVA Entrepreneurship-Cup

Fall 2014, 2012

\$25K, 1st Place Winner, 2012: PhageFlag Rapid Bacterial Diagnosis. Appointed presenter.

EXPERIENCE - PROFESSIONAL

Cambridge, MA

Sample6 Technologies

Fall 2015 - Present

Junior Product Manager, market guide to next synthetic biology-based bacterial sensor for food safety.

Draper Laboratory, Inc.

Cambridge, MA

REDFLOW/Kadence with Dr. Rachele Prantil-Baun & Dan Harjes

Summer 2012

Biomedical Intern in artificial kidney development in order to improve blood health during dialysis.

VitalISE project with Dr. John Williams, James Bickford & Dan Harjes

2008-2009

Lab Researcher to develop a compact Ion Selective Electrode sensor for future NASA Mars mission.

Adhesive Stress Electrostatic Sensor, Dr. John Williams and Malinda Tupper

Summer 2007

Lab Researcher on team to create a microfluidic biosensor providing rapid tuberculosis diagnosis.

EDUCATION

University of Virginia, School of Engineering and Applied Science

Charlottesville, VA

Bachelor of Science in Biomedical Engineering

May 2013

With High Distinction, Major GPA **3.8**

Jefferson Scholar – Full Tuition Merit Scholarship, **Rodman Scholar, Lawn Resident**

Semester at Sea, Engineering a New Tomorrow

May 2011

HIV/AIDS and Healthcare in the Caribbean: Explored medical sustainability with field studies in health clinics of Trinidad, Panama, Costa Rica, Honduras and Guatemala. Intermediate Spanish.

IGNITIONPROGRAMS
I HELPED
TO FOUND
OR INITIATE**Bio-Med TechGirls Program**

2014, 2015

Co-Director and facilitator of summer outreach program to teach biomedical design high school-aged young women; exposing them to UVA's BME faculty and labs, and encouraging them to experiment in the STEM field. **2014-Pilot: Design Challenge, Trachoma. 2015: Prosthesis.**

Charlottesville Open Bio Labs

Fall 2014

MeetUp Group, to build a local DIYbio lab for synthetic biology education and tinkering at the community level. Homemade centrifuge and PCR Thermocycler built, campaign video in progress.

BioSP@CE Intern

Spring 2015

Lead BioTech Investigator for SP@CE to generate a report gauging the feasibility to build out an incubator, accelerator, and wet lab space for Charlottesville's biotech sector. +10 CEO/PI interviews.

Health UnBound (HUB)

Summer 2014

University organization to raise the tide of health innovation at UVA, providing interdisciplinary students at the undergrad and graduate level with access to project resources for clinical advances.

UVA Contingent- University Innovation Fellowship

Initiating Leadership Circle, Spring 2014

Integration into a national network of Stanford/NSF/VentureWell supported student representatives to improve the rigor of college STEM education toward technology-based innovation and entrepreneurship. Drafted declaration at Google Campus during **2014 OPEN Conference, San Jose.**

UVA's 1st & 2nd Annual Health Hackathon

Founder, Fall 2013; Exec Team, Fall 2014

28 hours, 56 diverse participants from across the East Coast, 10 teams, and over \$15,00 in prize value, in a fast-paced competition to identify, understand, solve and market solutions for the health field, including featured design challenges from Type-1 Diabetic patients and Roche Diagnostics.

GROWTH**Engineering Students Without Borders (ESWB), Exec Board**

2009-2013

President, '12. Oversaw 400% growth of club to ~60 students. Expand operations to 8 active project teams, fostering responsible engineering for basic human needs and launched ESWB's flagship project, partnering Nicaraguan NGO. **Events Committee Chair, '11. International Project Chair, '10**

Jefferson Public Citizens: Grant Recipient for Public Service & Research

2009-2011

Water and Health in Limpopo (WHIL). Univ. Venda, South Africa

Team Member. Acquired \$29,200 grant support to improve rural water-sanitation. Developed a water education program. Collected IRB guided focus group research in activism around water health.

Published and Presented for Jefferson Public Citizens Journal & Virginia Policy Review Journal,

"Bypassing Politics: Education as a Powerful yet Neutral Development Solution"

VA Governor's Youth Entrepreneurship Forum**BioTrep, Student-led Start-up Engine, Advisor****Entrepreneurship Group at McIntire, Exec Board- Engineer Liaison**

2012-2013

COMPETITIONS & PRESENTATIONS**Grab-Cab Veteran Amputee Prosthesis Design Challenge: 4th Place**

Summer 2015

Prosthetic aid for applying blood sample to a glucose monitor, designed for amputee veterans with diabetes.

\$2K, Social Entrep. Division Semi-Finalist: Surge, reusable AED pads for CHUK, Rwanda.

Fall 2014

2nd Place Ribbon: Dark Honey Division, Albemarle County Fair

Fall 2014

Speaker: Start-up Journey: Sample6 Harvard Business Review for BME: Advanced Design class

Spring 2015

FlashTalk: BeCamp: I challenge you to a new code language -- DNA.**Speaker: Local Problem Identification for Engineering Students w/o Borders Conference**

Fall 2014

Speaker: Consulting from a 12ft Hole: Lessons from building water sanitation infrastructure in SA

For class: Engineering and Consulting class

Winter 2014

Panelist: Ethics, Practice and Protocol of International Research

Winter 2014