

WINNER OF \$15000 AT A STARTUP COMPETITION

## Shivani Tuli

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### EDUCATION

**University of Pittsburgh, Pittsburgh PA**

Expected Graduation: April 2021

Bachelor of Science in Bioengineering

Minor in Economics, Industrial Engineering, Chemistry

### SKILLS

**Computer Proficiencies:** Python, Machine Learning and Data Analytics (Linear regression, logistic regression (sigmoid), Decision-trees, Ensemble models (ADA Boost and Gradient Boost), Bayesian methods, clustering, Principal Component Analysis, Non-Negative Matrix Factorization), Java, Bio-Python, Bioinformatics, Minitab, JPM (Statistical tool), Matlab, LabVIEW, Microsoft Office, Microsoft Project, SQL, R Programming

**Industrial Skills:** Project Management (Agile and Waterfall), Six Sigma, Design of Experiment

**Wet-lab Skills:** Polymerase Chain Reaction (PCR), Cell Culture, Microscopy, Nanotechnology, Bradford Assay, Western Blot, and MTS Assay, FlowCytometry, Chromatography

**Languages:** English, Hindi, Gujarati, (bilingual Proficiency), Marathi (Conversational)

### RELEVANT EXPERIENCE

**UPMC Hillman Cancer Center**

June 2020 – Present

*Undergraduate Researcher, University of Pittsburgh*

- Collaborate with Dr. Shikhar Uttam, and Dr. Rebecca Burgess Department of Biology, Stevenson University in order to Decipher the Combinatorial Role of Histone Modifications in Site-Specific Chromatin Environments.
- Applied Bioinformatics approaches as well as combinatoric approaches using machine learning algorithms based on Non-Negative Matrix Factorization to produce optimum results.

**Matthews' International**

May 2020– August 2020

*Project Manager*

- Lead a team of engineers as a part of a class to develop a Return on Investment (ROI) model for a foundry automation project. This was later presented by the Matthews project team to the Board.
- Maintained regular communications with the stakeholder and presided over the weekly team, one on one and stakeholder meetings. Device a complete project charter and used Microsoft Office Project

**Bayer Pharmaceuticals**

February 2020– May 2020

*Systems Engineering Co-op*

- Worked on updating the Task Analysis reports, and FDA 501k pre-submission reports
- Set up protocols for Microbial Ingress testing (Protocols, B/F testing, and Product Quantity Management) and Chemical Integrity Testing according to the USP 788 (Particle matter in injections) to device microbial ingress test protocols for Centargo (A CT injector) and Stellant Flex (MRI injector) and ordered supplies for the same.
- Participated in Human Factors Validation Testing for two devices: Net-Gen CT (CT injector) : initial phase testing, and Centargo (CT injector): Later Phase testing in accordance with the FDA for product sales in the US.
- Trained on RQM, ISO: 13485:2016, and FDA classification of devices as well as certain Project Management skills.
- Assisted with the supply chain during COVID-19, visited the plant site in Indianola and assisted with injectable manufacturing on a sterile environment assembly line and developed a new idea for process optimization.

**Johns Hopkins University**

October 2019– December 2019

*Systems Engineering Co-op*

- Worked towards new novel drug development for colon cancer treatment.
- Analyzed SNP Data using python packages, managed the wet lab as well as performed Bradford Assay, Western Blot and MTS assays (MTT assay that uses tetrazolium dye for cell vitality assay) for the various cancer cell lines.
- Assisted with lab animal management as well as ordering and assistance with tumor implantation and drug testing.
- Attended lectures and interacted with Nobel laureates. Managed regular lab workings as well as restocking and maintaining the Laminar flow hoods as well as cell incubators.

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### UPMC Hillman Cancer Center

May 2018 – December 2018

*Undergraduate Researcher, University of Pittsburgh*

- Applied nanotechnology using STORM (Stochastic Optical Reconstruction Microscopy) Super-resolution imaging of genome organization at a single nucleosome level ("nucleome") in cancer progression.
- We performed "Tyramide Signal Amplification" by applying biotinylated tyramine, to detect specific proteins, that have been used to increase the signal in conventional microscopy. The aim was to administer and improve this technique to STORM imaging on culture cells as well as Formalin-fixed, Paraffin-embedded (FFPE) tissue, to acquire high-quality super-resolution images.

### School of Pharmaceutical Sciences

February 2017 – May 2018

*Undergraduate Researcher, University of Pittsburgh*

- Built Polysaccharides hydrogel beaded scaffolds and optimized the building conditions for the same. The non-toxic scaffolds were then implanted in mice skull model for drug delivery to test the drug's bone regeneration ability the scaffold itself when a circular shaft of more than 2mm drilled into a mice skull.
- Performed decalcification and storage parts of mice skull. Then created wax blocks using a HistoEmbedder and evaluated and wrote a protocol on the Histo-Embedder for regular lab use.
- Monitored the impact of oxaloacetate ions, on breast cancer tumor microenvironment to test the hypothesis of whether breast cancer is primarily metastasis to bone cancer.
- Maintained laboratory records and stored sacrificed mice bones.

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## AWARDS & ACHIEVEMENTS

Blast Furness, Big Idea Center

October 2019–December 2019

*Idea Founder and Project Lead, University of Pittsburgh*

- 2nd place winner of \$15,000 in Randall Family Big Idea Competition, a university wide idea competition and selected for exclusive student accelerator program to continue development of a CBC handheld device for rural international populations. Designed a paper-prototype of the design using Auto-CAD and Solid works tools.
- Performed on site customer discovery via travelling to numerous remote villages in India to administer on-ground conditions and perform market research, as well as connect to local doctors to get a better design input. Connected with government hospitals in India to develop supply channels upon product development.
- Developed financial, revenue, and business models for the product, delegated marketing responsibilities.
- Worked on regulatory strategies to advance product by reviewing pre-FDA approval paperwork for protocols in the United States, Europe and Indian markets.

Blast Furness, Big Idea Center

January 2019–August 2019

*Idea Founder and Project Lead, University of Pittsburgh*

- Finalist in university-wide entrepreneurship competition (Randall Family Big Idea Competition) and member of exclusive Blast Furnace Startup Accelerator program
- Worked with a team of engineers to developed and engineered a pill enclosure for critical care patients for better medication adherence
- Performed customer discovery and collaborated with Physicians, nurses to distribute the product.

Start-up Blitz, Big Idea Center

August 2017

*Innovator, University of Pittsburgh*

- Worked with a team of Chemical engineers to come up with an idea during Start-up Blitz, over a period of 24 hours. Pitched the Idea at the end to a group of Investors and business owners.
- The problem was that Hypothyroidism patients have to take the medication multiple times in a day at different times to get the drug to act at a particular time in a day. Which causes altered lifestyles.
- The idea was "LevoXtend" a medicine that works on the Incorporates a complex fatty chain to increase drug loading and a sustained release capsule so, the patient has to take the medication once a week.

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## LEADERSHIP & COMMUNITY INVOLVEMENT

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Rice360 global health technologies competition  
*Idea Founder and Project Lead, Rice University*

January 2019 – March 2019

- Developed a project with a global health outlook, to support remote location in the world with lack of medical assistance. Partnered with pharmaceutical companies, Pathologists, Research Scientist and Professors to devise design specifications that encompass numerous testing parameters for complete blood count and device commercialization methods.
- Coordinated product development, and video, poster and presentation in order to reach the semi-finals in an international global-health design competition

Design Hub  
*Team Member*

January 2018 – December 2018

- Engineered a CPR assist reduces alongside 6 other engineers to solve the problem of discomfort that comes with administering CPR by providing an assistive device used in training and real-world application.
- The device ensures that proper depth and compression rate is achieved while performing CPR. As well as have the training fresh in trainees' heads.
- Performed stakeholder research and FDA approval guidelines for the project and submitted the design for a university patent approval.

Paramount Diagnostics and Research Center  
*Student Volunteer*

June 2012- May 2018

- Remotely helping set up a Pathology and microbiology lab in India for cheaper medical tests for the underprivileged.
- Creating a project feasibility report for pathology lab set up for devices such as PCR, HistoPathological devices and microbiology test devices, to performs tests like Hepatitis, Malaria, Syphilis, Cancer Biopsies and calculating the price for the equipment and providing it to the board.
- Developed a breast cancer awareness campaign to raise awareness at the community level. Organized events to promote the campaign. Teamed up with doctors to discuss effective measures to increase awareness about the campaign.

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### LICENSES & CERTIFICATIONS

- Algorithms for DNA sequencing, by Johns Hopkins University September 2019
- Statistics for Genomic Data Science, by Johns Hopkins University September 2019
- Python for Genomic Data Science, by Johns Hopkins University July 2019