



TRANSLATING RESEARCH INTO INDUSTRY

Undergraduate Research Ambassadors



PRESENTERS



OWEN HALE

4th Year
Biology



MANAV JAIN

3rd Year
Biomedical Engineering



CAROLANN ESPY

4th Year
Biochemistry



ASHI AWASTHI

3rd Year
Biomedical Engineering

WHAT IS RESEARCH IN INDUSTRY?

- Primary post-graduation paths
 - Academia
 - **Industry**
 - Government
- Many organizations recruit research scientists
 - Startup to Fortune 500
 - Almost any discipline
 - Undergraduate - PhDs
 - Including entrepreneurial flexibility
- Business sector performed **73%** of the **\$548 billion** of U.S. R&D total in 2017



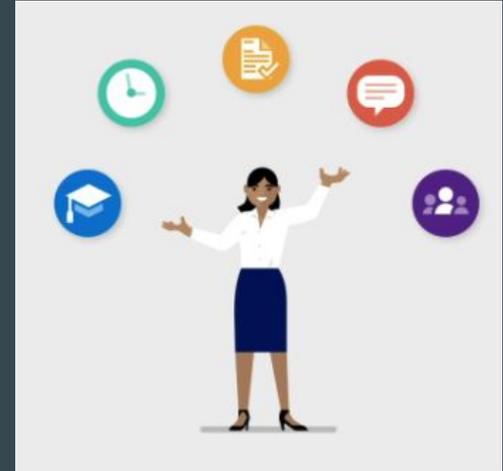
INDUSTRY VS. ACADEMIA - SIMILARITIES

- Scientific Process
 - Pushing bounds of science
 - Publishing in journals
- Teamwork and collaboration
 - Teams within larger organization
- Opportunity for growth
 - Both provide career development
 - Transitioning between is common
- Politics
 - Organizational politics exist everywhere



INDUSTRY VS. ACADEMIA - DIFFERENCES

- Freedom and flexibility
 - Academia freedom
 - Topic of research
 - Schedule
 - Teammates
- Money
 - Industry scientists statistically tend to make more
 - Grant writing
- Career path
 - Academia generally leads to professorship, tenure
 - Industry research leads to principal scientist
 - More common to transition to business
- Academics generally teach and work with students often



GENERAL CONSIDERATIONS

- Everything varies by school and company
- Many paths involve both
- Top R&D business sectors
 - Computer and electronics production
 - Chemicals manufacturing
 - Transportation equipment (including aerospace)
 - Information Technology
 - Professional, scientific, and technical (PST) services
 - Specialized services



Learn more about our decisions at office hours!

AMBASSADOR EXPERIENCES



Sophia Wiesenfeld

3rd yr - Biology

I really like the applications of my work, specifically in biotechnology-- I engineer novel strains of bacteria, and industry jobs involved in that seem exciting because they focus on end protect: for example, engineering bacteria to act as 'living sensors' to test water quality for heavy metals or contaminants.



Jordan Guistwhite

3rd yr - ChemE

I want to go into industry research after my bachelors to work closer to the product end of the development process and have business opportunity flexibility in the biotech and pharmaceutical industry.



Premi Mohanavelu

4th yr - Computer Science

I'm interested in using computer science to improve the quality of care that patients receive and developing interfaces that treat the human as a central component. I want to eventually be a physician consultant for healthcare start-ups to be at the forefront of medical innovation.

LEVERAGE RESEARCH SKILLS FOR INDUSTRY



TECHNICAL KNOWLEDGE

Research provides a depth of knowledge that's invaluable in both an academic and industry setting



COMMUNICATION

Both industry roles and research positions require a strong hold on technical writing and ability to communicate in interdisciplinary environments



BREADTH OF APPLICABLE SKILLS

Industry and academia work, at its core is the same. Find the skills that transfer and highlight them.



CREATIVITY

Creative problem solving is an integral part of any innovative process. Research and design thinking transfer directly to industry

PITCHING RESEARCH TO RECRUITERS



- Research is about
 - (1) topic / problem
 - (2) tools used
 - (3) solution.
- Explain to a recruiter how your skillset translates to that company/industry
 - How can the tools you have solve the problem to provide solution

HOW TO COMMUNICATE YOUR EXPERIENCE

RESUME TIPS

- Find optimal level of technicality in description
 - Anyone can understand impact
 - Expert can derive your experiences
- Emphasize broader impact of your work
- Demonstrate skills you learned
 - Technical and Interpersonal
- Show how experience is applicable to the industry
- Highlight your personal contributions and responsibilities



EXAMPLE RESUMES

RESEARCH

Georgia Institute of Technology | Atlanta, GA

President's Undergraduate Research Award Recipient – Schmidt-Krey Lab January 2021 - Present

- Wrote thesis on structure of Photosystem II to complete the research Option
- Analyzed amino acid sequences of different species of Photosystem II using BLAST and Clustal Omega

Research Assistant – Schmidt-Krey Lab January 2018 - Present

- Performed image processing for the protein Photosystem II post cryogenic Electron Microscopy
- Directed the optimization of the 3-D rendering for Urea Washed Photosystems II using cisTEM 1.0.0
- Prepared buffers for sample incubation periods in preparation for electron microscope imaging

Petit Undergraduate Research Scholar – Schmidt-Krey Lab January - December 2020

- Analyzed structures of different species of Photosystem II using PyMOL and BLAST
- Continued to oversee the Urea Wash Photosystem II 3-D optimization in the Schmidt-Krey lab

President's Undergraduate Research Award Recipient – Schmidt-Krey Lab August - December 2019

- Awarded stipend for semester of research based on abstract that was chosen from among a competitive pool
- Culminated as a final research paper surrounding the progress made on the 3-D optimization of Photosystem II

College of Sciences Early Research Award – Schmidt-Krey Lab January - May 2019

- Awarded stipend for semester of research as an exemplary first-year student from the College of Sciences
- Worked with a signaling protein, signal peptide peptidase, and shadowed cell culturing and protein extraction

PRESENTATIONS

Neselu, K., **Espy, C.**, Schmidt-Krey, I. (2020) "Structure-Function Studies of Highly Active Photosystem II using Single Particle Cryo-EM" Poster presented at the College of Sciences Graduate Recruitment Fair Atlanta, GA.

Neselu, K., **Espy, C.**, Schmidt-Krey, I. (2020) "Structure-Function Studies of Highly Active Photosystem II using Single Particle Cryo-EM" Poster presented at the Undergraduate Research Ambassador's Poster & Pancakes event Atlanta, GA.

Espy, C., Neselu, K., Schmidt-Krey, I. (2020) "Structure-Function Studies of Highly Active Photosystem II using Single Particle Cryo-EM" Poster presented at the Petit Undergraduate Research Scholar's Poster event Atlanta, GA.

PUBLICATIONS

Neselu, K., Uddin, Y. M., **Espy, C.**, Rai, J., Sofroniou, M., Damm, T., Woods, E., Stroupe, M. E., Barry, B. B., Schmidt-Krey, I. (2020). Structural variation in a highly active spinach photosystem II core complexes upon removal of extrinsic subunits. [in preparation]

Strickland, K.M., Neselu, K., Grant, A.J., **Espy, C.L.**, McCarty, N.A., and Schmidt-Krey, I. (2021) Reconstitution of detergent-solubilized membrane proteins into proteoliposomes and nanodiscs for functional and structural studies. *Meth. Mol. Biol.* In Press.

Experience

VIP - Health Informatics on FHIR, Project Manager | Design Lead

January 2018 - present

- Develop mobile apps to optimize patient workflow of Grady Memorial Hospital's Emergency Department
- Synthesize user research from field visits and generate design alternatives for tangible digital user experience
- Use Agile methodologies to ensure timely delivery of prototypes and coordinate work between teams
- Recruit students from various majors and train new members in user centered design process

Laboratory of Pathology Dynamics, Undergraduate Researcher | Lab Manager

August 2018 - present

Meta-analysis on the comparative Gastrointestinal safety profiles of 2nd gen TKI treatments for chronic myeloid leukemia

- Building a predictive medicine model that selects the best therapy for a patient based on multifactorial relationships
- Analyze aggregated dataset of over 10k patients using **biostatistical** methods and unsupervised learning algorithms
- Author conference proceedings and present research at industry conferences and research symposiums
- Manage and coordinate communication between 38 lab members including undergraduate and graduate students

Conference Proceedings & Presentations

- **Prahathishree Mohanavelu**, Mira **Mutnick**, Brandon White, **Xinyu** Chen, Cassie S. Mitchell (2019, October). *Meta-Analysis on the Comparative Gastrointestinal Safety Profiles of Second-Generation BCR-ABL Tyrosine Kinase Inhibitors as Compared to Imatinib*. Poster presented at 2019 Annual Meeting of the Biomedical Engineering Society, Philadelphia, Pennsylvania.
- **Nidhi Mehra**, **P.Mohanavelu**, K. Hernandez-Kluesner, M. Mutnick, A. Bikmal & Dr. C.S.Mitchell (2019, April). *Informatics-based Literature Mapping to Personalize Therapy for Chronic Myeloid Leukemia*. Poster presented at 14th Annual Undergraduate Research Spring Symposium at Georgia Tech, Atlanta, Georgia.
- M. **Mutnick**, N. **Mehra**, **P. Mohanavelu**, K. Hernandez-Kluesner, A. **Bikmal**, **C.S.Mitchell** (2019, April). *Data Integration to Improve Predictive Medicine in CML*. Poster presented at 2019 SEMDA **Medtech** Conference, Alpharetta, Georgia.
- N. **Mehra**, **P. Mohanavelu**, A. **Bikmal**, M. **Mutnick**, C.S. Mitchell, Ph.D. (2018, November). *Informatics-based Literature Mining for Predictive Medicine: Personalizing Chronic Myeloid Leukemia Therapy*. Poster presented 2018 Health Systems: The Next Generation Forum, Atlanta, Georgia.

HOW TO COMMUNICATE YOUR EXPERIENCE

INTERVIEW TIPS

- Research your interviewer before hand
 - Tailor conversation to level of expertise
- Show how your work is applicable to the company
- Highlight your curiosity
- Use job description to your advantage



**Job description
skill**



**Identify underlying
skill**



**How did research
experience teach this
skill**

HOW TO FIND RESEARCH IN INDUSTRY

- Personal Connections
 - Use LinkedIn to find connections at companies of interest
 - Talk to professors and grad students
- Georgia Tech Resources
 - See next slide
- Online Resources
 - LinkedIn, Indeed, Glassdoor...
- Specific Companies
 - Largest R&D Companies
 - See list of top 10
- Company list
 - Samsung
 - Alphabet
 - Volkswagen
 - Microsoft
 - Huawei
 - Intel
 - Apple
 - Roche
 - J&J
 - Daimler

MORE GATECH RESOURCES

- Career Center (formerly C2D2)
 - <https://career.gatech.edu/>
 - Host career fairs and info sessions
 - Resources for job search (resume, cover letter, interviewing, etc)
 - Appointments with career advisors
- CareerBuzz
 - <http://career.gatech.edu/careerbuzz>
 - Job board for internships, full-time positions, and co-ops
- Mailing lists for industry interests
 - <https://lists.gatech.edu>
 - Advisors send out opportunities via mailing lists

THANK YOU

- Keep in touch with URA
 - Instagram: @gt_ura
 - Facebook: Georgia Tech Undergraduate Research Ambassadors
 - Website: www.undergradresearch.gatech.edu -> URA
- URA Office Hours
 - <http://www.undergradresearch.gatech.edu/content/ura-office-hours-and-other-resources>
- Upcoming events
 - New Researchers Panel: March 11th, 11-12pm
 - Communicating Your Research: March 25th, 11-12pm
 - Research Fair: April 8th, 11-12pm



QUESTIONS?

