

# Anjali Byappanahalli

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## EDUCATION

- Purdue University, West Lafayette, IN May 2021  
 Bachelor of Science in Neurobiology and Physiology GPA: 3.66/4.00  
 Minor in Chemistry  
 Biology Honors Program and Purdue Honors College  
 Thesis Title: Characterization of lung cancer exosomes and their impact on non-cancerous lung epithelial cells
- Foundation for Advanced Education in the Sciences (FAES), National Institutes of Health (NIH), Bethesda, MD Fall 2021  
 Graduate coursework: BIOL 393 Practical R (2cr)

## RESEARCH EXPERIENCE

- Post-baccalaureate Research Fellow, National Institute on Aging, National Institutes of Health** Jul. 2021 – Jun. 2023
- Studying the role of extracellular vesicles and mtDNA in age-associated diseases including frailty and hypertension
  - Use techniques including DNA/RNA isolation, PCR (qPCR, rt-PCR), cell culture, mitochondrial respiration
  - Learned R data analysis and visualization, biostatistical modeling with linear regression
- Undergraduate research assistant, Dr. Andrea Kasinski, Purdue University** Jan. 2019 – May 2021
- Isolated, characterized, and analyzed the role of cancerous exosomes on non-cancerous lung epithelial cells
  - Learned cell culture and relevant assays, such as proliferation, wound healing, soft agar, and uptake assay
  - Developed a methodology for wound healing assay analysis and colony counting with ImageJ
  - Shadowed fellow graduate students on assays including migration and TEER progression
- William H. Phillips Summer Research Internship for Summer 2020, Dr. Andrea Kasinski, Purdue University** Summer 2020
- Designed and conducted a multi-cell line wound healing assay to evaluate the impact of cancerous exosomes on wound healing in recipient non-cancerous cells using an Incucyte S3 machine
  - Characterized several cell lines' abilities to form aggressive colonies
- Summer Undergraduate Research Fellowship (SURF), Dr. Andrea Kasinski, Purdue University** Summer 2019
- Participated in a ten-week research intensive program in the laboratory of Dr. Andrea Kasinski
  - Attended professional development workshops and research seminars
  - Conducted a research project resulting in an oral presentation and written technical paper:
    - Byappanahalli, A.M., Soto-Vargas, Z., Hasan, H., Sohal, I.S., Kasinski, A.L. (2019, August). Characterization of Exosome-like Extracellular Vesicles and Their Impacts on Lung Epithelial Cells. Purdue University Summer Undergraduate Research Fellowship, Purdue Libraries.
- Undergraduate research assistant, Dr. Cindy Nakatsu, Purdue University** Fall 2017
- Characterized the invasive plant oriental bittersweet with microbial genetics laboratory techniques
  - Isolated and quantified DNA from soil samples
  - Utilized techniques including restriction digests and gel electrophoresis to profile isolated DNA

## **PUBLICATIONS**

- Byappanahalli, A.M.**, Noren Hooten, N., Vannoy, M. *et al.* Mitochondrial DNA and inflammatory proteins are higher in extracellular vesicles from frail individuals. *Immun Ageing* **20**, 6 (2023). <https://doi.org/10.1186/s12979-023-00330-2>
- Noren Hooten, N., **Byappanahalli, A.M.**, Vannoy, M., Omoniyi, V., and Evans, M.K. *Influences of Age, Race, and Sex on Extracellular Vesicle Characteristics*. *Theranostics* 2022; 12(9):4459-4476. doi:10.7150/thno.72676.
- Hasan H., Sohal I.S., Soto-Vargas Z., **Byappanahalli A.M.**, Humphrey S.E., Kubo H., Kitdumrongthum S., Copeland S., Tian F., Chairoungdua A., Kasinski A.L. *Extracellular vesicles released by non-small cell lung cancer cells drive invasion and permeability in non-tumorigenic lung epithelial cells*. *Sci Rep.* 2022 Jan 19;12(1):972. doi: 10.1038/s41598-022-04940-6. Erratum in: *Sci Rep.* 2022 Feb 14;12(1):2804. PMID: 35046472; PMCID: PMC8770483.

## **PRESENTATIONS**

- Byappanahalli, A.M.**, Noren Hooten, N., Vannoy, M., Mode, N.A., Ezike, E., Zoneraman, A.B., Evans, M.K. (2023, May). Mitochondrial DNA and inflammatory proteins are higher in extracellular vesicles from frail individuals. Poster presentation, Extracellular RNA (exRNA) Communication (ERCC19) Conference, National Institutes of Health, Bethesda, MD.
- Byappanahalli, A.M.**, Noren Hooten, N., Vannoy, M., Mode, N.A., Ezike, E., Zoneraman, A.B., Evans, M.K. (2023, April). Mitochondrial DNA and inflammatory proteins are higher in extracellular vesicles from frail individuals. Poster presentation, Postbaccalaureate Poster Day Retreat, National Institutes of Health.
- Byappanahalli, A.M.**, Noren Hooten, N., Vannoy, M., Mode, N.A., Ezike, E., Zoneraman, A.B., Evans, M.K. (2023, March). Mitochondrial DNA and inflammatory proteins are higher in extracellular vesicles from frail individuals. Online Poster presentation and Ted Talk, National Institute on Aging IRP Scientific Retreat, National Institutes of Health.
- Byappanahalli, A.M.**, Noren Hooten, N., Evans, M.K. (2022, November). Extracellular vesicles as novel biomarkers in frailty. Oral presentation, Postbac Elevator Pitch, National Institutes of Health, Bethesda, MD.
- Noren Hooten, N., **Byappanahalli, A.M.**, Vannoy, M., Mode, N.A., Ezike, N., Zonderman, A.B., Evans, M.K. (2022, October). Extracellular vesicles in aging and age-related conditions. Oral presentation, American Society for InterCellular Communication, Potomac, MD.
- Byappanahalli, A.M.**, Vannoy, M., Noren Hooten, N., Mode, N., Zonderman, A.B., Evans, M.K. (2022, March). EV characteristics are altered with frailty. Online poster presentation, Postbac Poster Day, National Institutes of Health.
- Byappanahalli, A.M.**, Vannoy, M., Noren Hooten, N., Mode, N.A., Zonderman, A.B., Evans, M.K. (2022, March). EV characteristics are altered with frailty. Online poster presentation and Ted Talk, National Institutes on Aging IRP Scientific Retreat, National Institutes of Health.
- Byappanahalli, A.M.**, Soto, Z., Kasinski, A.L. (2021, April). Evaluating the potential of transformed extracellular vesicles in driving cellular transformation. Online poster presentation session, Virtual Undergraduate Research Expo, Purdue University, West Lafayette, IN.
- Hasan, H., Sohal, I.S., Soto, Z., **Byappanahalli, A.M.**, Humphry, S., Kubo, H., Kitdumrongthum, S., Chairoungdua, A., Kasinski, A.L. (2021). A comprehensive comparative analysis of extracellular vesicle release in non-small cell lung cancer and its potential to drive cancer hallmarks in non-cancerous lung epithelial cells. Oral presentation presented at the International Society for Extracellular Vesicles (ISEV). Online.
- Byappanahalli, A.M.**, Soto, Z., Singh, I.S., Hasan, H. (2020, April). Characterization of lung cancer exosomes and their impact on non-cancerous lung epithelial cells. Online poster presentation session, Virtual Undergraduate Research Expo, Purdue University, West Lafayette, IN.
- Soto, Z., Hasan, H., Sohal, I.S., **Byappanahalli, A.M.**, Blankenberger, K., and Kasinski, A.L. (2019). Uptake of non-small cell lung cancer derived exosomes by normal bronchial epithelial cells drives invasion. Poster session presented at the International Society for Extracellular Vesicles (ISEV), Nashville, TN.
- Soto, Z., Hasan, H., Sohal, I.S., **Byappanahalli, A.M.**, Blankenberger, K., and Kasinski, A.L. (2019). A CRISPR-CAS9 knockout screening to identify critical genes involved in non-small cell lung cancer (NSCLC) exosomes uptake. Poster session presented at the annual Biology Department Retreat, Purdue University, West Lafayette, IN.
- Singh, I.S., Soto, Z., Hasan, H., **Byappanahalli, A.M.**, Blackenberger, K., Kasinski, A.L. (2019). Lung cancer exosomes induce barrier impairment, permeability, and epithelial-to-mesenchymal transition in a 16-day mature bronchial epithelium, Poster session presented for the Department of Biological Sciences, Purdue Center for Cancer Research, Purdue University, West Lafayette, IN.
- Byappanahalli, A.M.** (2019, August). Characterization of exosome-like extracellular vesicles and their impacts on lung epithelial cells. Oral presentation session, Summer Undergraduate Research Fellowship Symposium, Purdue University, West Lafayette, IN.

## PROFICIENT LABORATORY SKILLS

- Human cell culture
- Cell-based assays (wound healing, soft agar, uptake, proliferation)
- Basic imaging
- Electrophoresis (gel/agarose, SDS-PAGE)
- Polymerase Chain Reaction (PCR) and real time PCR (rt-PCR)
- cDNA preparation
- Exosome isolation (ultra-centrifugation, size exclusion chromatography)
- DNA/RNA isolation
- Mitochondrial respiration assays (Seahorse)
- Plasma and PBMC isolation from blood

## RELEVANT SKILLS & STRENGTHS

- Fluent in Microsoft Suite, Adobe Photoshop/Illustrator
- BioRender graphics
- Experienced in GraphPad Prism, ImageJ (NIH)
- R data analysis and visualization
- Interpersonal skills
- Leadership and collaboration
- Written and verbal communication
- Critical thinking and problem-solving
- Leading teams towards a shared goal
- Intermediate Japanese language skills
- Digital photography

## RELEVANT COURSEWORK

### **Biological sciences and chemistry**

Diversity, Ecology, and Behavior; Development, Structure, and Function of Organisms; Cell Structure and Function; Genetics and Molecular Biology – Honors; Introduction to Ecology and Evolution; Eukaryotic Cell Biology; Neurobiology; Human Anatomy and Physiology I & II; Principles of Physiology; Endocrinology; Biochemistry: Molecular Approaches – Honors; General Chemistry with Biology Focus; Organic Chemistry I & II

### **Mathematics and physics**

Physics for Life Sciences I & II; Statistical Methods for Biology; Plane and Analytical Geometry Calculus I & II

### **Leadership theory and practice, communication**

Executive Leadership Studies; Critical Leadership Studies; Global Approaches to Leadership, Science Writing and Presentation

### **Data analysis, transformation, and visualization**

Practical R for data manipulation, analysis, and visualization (Foundation for Advanced Education in the Sciences (FAES))

### **Workshops**

Statistical Inference for Non-Statisticians, A Data Scientist's Toolkit: Concepts and Applications in R (statistical modeling)

## LEADERSHIP EXPERIENCE | ACADEMIC & PROFESSIONAL ORGANIZATIONS

### **Science & Snacks, Post-baccalaureate Journal Club, National Institute on Aging**

Dec. 2022 – Present

- Organized a journal club for post-baccalaureate research fellows at the National Institute on Aging in conjunction with the National Institute on Drug Abuse
- Focus is to highlight disparities in science education and healthcare, as well as develop skills in critically evaluating hypothesis-driven research
- Played a key role in establishing achievable goals and securing institute support for the club

### **Honors Mentor Program President, Purdue University**

Dec. 2019 – Dec. 2020

- Led an organization of 100+ mentors, who guided over 750+ incoming Honors College freshman
- Utilized skills such as systems thinking/planning and interpersonal motivation to enact the program goals and delegate tasks to the program's planning committees
- Major roles included training mentors to address bias, promote inclusion, and celebrate diversity; fostering leadership language; building an inclusive community
- Cultivated skills in resiliency and adaptability

### **Honors Mentor Council Social Media and Outreach Committee Chair, Purdue University**

Dec. 2018 – Dec. 2019

- Applied skills such as digital design and summarizing/distilling information to build an engaging social media platform for mentors to cultivate a community and reflect on training concepts
- Used interpersonal skills to organize casual gatherings to foster a supportive community
- Increased program engagement through social media initiatives and successful events

### **Honors Mentor for Purdue University Honors College, Purdue University**

Mar. 2018 – Dec. 2020

- Mentored groups of first-year students through a project-based course focused on critical thinking, collaboration, and interdisciplinary academics
- Cultivated leadership qualities including motivating others towards a common goal,

- facilitating health group dynamics
  - Refined skills in verbal communication and cultural awareness
  - Underwent extensive leadership training to foster group development and support individual students both in- and outside the classroom
- Diversity, Equity, and Inclusion Training Facilitator, Honors College, Purdue University** Aug. 2019, Aug. 2020
- Collaborated with the Student Diversity Office of the Honors College to create scripted videos depicting common instances of implicit biases for training purposes
  - Led groups of students in discussions regarding identifying and acting in instances of bias, and forms of allyship to promote inclusion
- Botany Club, Purdue University** Aug. 2017 – May 2020  
(Aug. 2019 – May 2020)
- Vice President
    - Focused on spreading the scientific and cultural importance of plants, fungi, and algae through fun and educational activities, as well as volunteering for local community programs
  - Club member (only) (Aug. 2017 – May 2018)
  - Communications and Social Media Chair for the PU Botany Club (Aug. 2018 – May 2019)
- Journal of Purdue Undergraduate Research, Student Executive Board Member, Purdue University** Aug. 2017 – May 2021
- Mentored and reviewed journal article submissions for upcoming publications from student authors

### ACHIEVEMENTS | GRANTS | HONORS

- Honors College Outstanding Senior Award, Purdue University** Apr. 2021
- For outstanding leadership, interdisciplinary academics, research, and commitment to global experiences awarded to two, fourth-year Honors College students
- Purdue Graduate Program “Say it in 6” Challenge** Apr. 2021
- Assisted in developing and photographing the diversity and inclusion submission for Purdue Graduate Professional Development challenge to tell a story about the graduate school experience in 6 words
- William H. Phillips Summer Research Grant Award 2020, Purdue University** May 2020
- Research internship for conducting full-time, undergraduate summer research
- Purdue Center for Cancer Research Undergraduate Research Grant Award 2020, Purdue University** May 2020
- Award winners of the grant proposal were recognized by the Purdue University Center for Cancer Research Committee after critical review and ranking by the Center
  - Canceled due to COVID-19
- Honors College Third Year Leadership Pillar Award, Purdue University** Apr. 2020
- For outstanding leadership and commitment to continuous learning
- Dean’s List and Semester Honors, Purdue University** Dec. 2017 – May 2021
- Presidential Scholarship, Purdue University** Aug. 2017 – May 2021
- Outstanding Mentor Award, Honors Mentor Program, Purdue University** May 2018
- Hurst Scholarship** May 2017

## **SERVICE & MEDICAL FIELD EXPERIENCE**

### **7Cups of Tea**

- Free and anonymous online emotional health service organization
- Support users through active listening while discussion topics regarding mental health (anxiety, stress, depression), family trouble, managing emotions, eating disorders, LGBTQ+ issues, grief counseling

Jan. 2022 – Present

### **Shock trauma operating room volunteer, University of Maryland Medical Center, Baltimore, MD**

- Volunteer responsibilities include restocking ORs, helping with on-demand requests (going to the blood bank, delivering pathology labs), preparing the patient for surgery, and providing supplies for the medical staff

Feb. 2022 – Jun. 2022,  
Oct. 2022 – Present

### **Hospice and senior care volunteering, PhysioCare Hospice, West Lafayette, IN**

- Volunteer responsibilities included planning and running engaging group activities with senior residents
- Coordinated planning for hospice care patients' final wishes

Dec. 2019 – May 2021

### **Shadowing**

- Hospital neurologist
- General hospitalist/internist
- Virtual shadowing

Aug. 2019 – May 2020

Jun. 2017

Aug. 2021 – Dec. 2021

Apr. 2018, Dec. 2019

### **Suture labs, Purdue University**

- Participated in workshops designed to teach students simple and uninterrupted sutures on learning boards and pig's feet