

Sai Deepika Reddy Yaram

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EDUCATION

West Virginia University <i>Ph. D. in Chemical and Biomedical Engineering; GPA: 3.41/4.00</i>	Morgantown, WV Aug 2024 – Present
West Virginia University <i>M.S. in Chemical and Biomedical Engineering; GPA: 3.39/4.00</i>	Morgantown, WV Aug 2022 – July 2024
Osmania University <i>B. Tech in Chemical Engineering; GPA: 3.9/4.00</i>	Hyderabad, Telangana Aug 2018 – July 2022

SKILLS

Design and Simulation Tools: Auto CAD, COMSOL Multiphysics, AVEVA Process Simulation, AVEVA PRO/II, Aspen Plus, Adobe Illustrator
Software Tools: Microsoft Office, LaTeX, GraphPad Prism 10, JMP Pro and R (Statistical analysis softwares)
Programming Languages: Python, MATLAB, C, C++, HTML

EXPERIENCE

West Virginia University <i>PhD Student (Graduate Research and Teaching Assistant)</i>	Morgantown, WV Aug 2024 – Present, Full-time
West Virginia University <i>MSc Student (Graduate Research Assistant)</i> <ul style="list-style-type: none">Thesis on Cellular Level Changes Induced in Cancer Cells Due to Microgravity	Morgantown, WV Aug 2022 – July 2024, Full-time
Osmania University <i>B.Tech (Undergraduate Researcher)</i> <ul style="list-style-type: none">Designed and simulated an extractive distillation process using AVEVA Process Simulation for separating a Tetrahydrofuran-ethanol azeotrope, achieving 99.9% THF purity with ethylene glycol as the entrainer.	Hyderabad, Telangana, India Aug 2019 – Aug 2022, Full-time
Indian Institute Of Chemical Engineers <i>Virtual Summer Intern</i>	Hyderabad, Telangana, India June 2020 – July 2020, Internship
Kothagudem Thermal Power Station <i>Undergraduate Engineering Intern</i>	Palwancha, India September 2019, Internship
ITC Limited <i>Undergraduate Engineering Intern</i>	Bhadrachalam, India May 2019, Internship

AWARDS & ACHIEVEMENTS

Grant Writing: – Co-authored successful NASA EPSCoR SEED grant proposal (\$20,000) by generating preliminary data and drafting initial submission. (April 2025)
News Article: – Recipient of Most out-of-this-world contribution by WVU scholars to The Conversation US for the article on microgravity and space. (April 2025)
Conference Recognitions: – ACS division of BIOL Travel Award to present at the ACS 2025 Fall Meeting in Washington, DC. (August 2025)
– Best Podium Presentation at the 12th Annual BioE Day at the University of Pittsburgh, Pittsburgh, PA, USA. (March 2025)
– 1st place in the poster session at the 51st Annual SciX Meeting in 2024, Raleigh, NC, USA (October 2024)
Student Employee: – Nominated for the 2024 WVU Best Graduate Student Employee of the Year Award. (April 2024)
Undergraduate Awards: – Received the IChE Best Student Award 2022 from the Indian Institute of Chemical Engineering (IChE) - Hyderabad Regional Chapter, India. (May 2022)
– National Merit Scholarship for all four years of undergraduate study. (August 2018 - July 2022)

- 1st place in the elocution competition on the topic "Single Use Plastics: The Future of Plastic Technology and the Role of Chemical Engineers in Making This Imagination a Reality," held during the IChE-HRC Inter-College Competitions in 2020. (October 2019)
- Recognized with a "Special Mention" for being the best party leader at the Youth Parliament organized by the University College of Engineering, Osmania University. (December 2019)
- 1st place in the Technical Quiz Competition, TECHNOSMANIA. (May 2019)

RESEARCH PROJECTS

Design & validate a microfluidic diagnostic platform for infectious diseases (Anaplasmosis and Lyme)

- A novel, label-free diagnostic platform is being developed using dielectrophoresis (DEP) integrated with optical, impedance, and machine learning techniques to detect tick-borne diseases directly from whole blood. Distinct dielectric changes were observed in Anaplasma-infected HL-60 cells, supporting the feasibility of DEP-based detection. Future efforts will be directed toward *Borrelia burgdorferi* characterization and the design and fabrication of a COMSOL-modeled microfluidic chip for efficient cell sorting and diagnosis.

3D clinostat with X-irradiation setup and the Dielectrophoresis technique to combat pancreatic cancer

- The effects of simulated microgravity and radiation on pancreatic cancer cells are being investigated using a novel 3D clinostat synchronized with X-irradiation. Alterations in cell morphology, dielectric properties, and viability have been observed in yeast, RBCs from PDAC patients, and MIA PaCa-2 cells. Ongoing work aims to identify microgravity-driven biomarkers to enhance cancer treatment strategies both in space and on Earth.

Design of Low-cost Microdevices for K-12 educational outreach.

- A low-cost microfluidic fabrication technique using xurography was explored as an alternative to traditional soft lithography. Microchannels were fabricated from laminate sheets, and electrodes were embedded to create non-uniform electric fields for bioparticle manipulation. Everyday materials were optimized for mixing devices, and successful integration with a DC power supply was achieved. Future efforts will focus on optimizing electrode placement and electric field conditions to enhance electrokinetic particle separation.

STEM SERVICE ACTIVITIES

Technical session Co-Chair: Co-chaired the Environmental Microfluidics session in the MSB conference (May 18-21, 2025), ASU, Tempe, AZ, USA

Poster Session Judge: 51st SciX Annual Meeting (Oct 20-25), Raleigh, NC, USA; 7th and 9th Spring Undergraduate Research Symposium; 16th and 17th Annual Summer Undergraduate Research Symposium at West Virginia University, Morgantown, WV, USA

STEM workshops & summer camps: Conducted "Let's Learn Engineering" workshop with a biomedical experiment demonstration at the Suncrest Elementary School (Spring '24); Engaged over 30 middle school students in hands-on experiments at Engineering Challenge Camp at WVU (Summer '25); Engaged over 30 freshman students in a hands-on spirometer experiment at Academy of Engineering Success (AcES) Workshop (Fall '25)

UNDERGRADUATE & HIGH SCHOOL STUDENT MENTORING

Mentored 4 high school students during Summer 2024 & 2025.

Alexa Bostic – SURE & RAP Student

Fall 2024 – Present

- NASA Undergraduate Research Fellowship (Apr '25).
- 3rd place in poster session at the 51st Annual SciX Meeting, Raleigh, NC, USA (Oct '24).
- NISBRE 2024 Merit Award, Washington, DC, for outstanding research presentation (Jun '24).

Ashley Smalley – SURE & RAP Student

Fall 2024 – Present

- ACS Bridge Travel & Professional Development Award (Aug '25).
- People's Choice Best Research Poster at 18th Annual Summer Undergraduate Research Symposium, WVU (Jul '25).
- Symposium Winner at 9th Annual Spring Undergraduate Research Symposium, WVU (Apr '25).

Supriya Rathinam – SURE & RAP Student

Fall 2024 – Present

Pratham Bhanushali

Spring 2025 – Present

Preetham Singh – Intern from IIT-D, India

Summer 2025

Kayla Wagner

Spring 2023 – Spring 2025

Anushka Pathak

Summer 2024 – Fall 2024

Kaelyn McClain
Sandra Shevtsova
Ingrid Vanessa Ferro
Harshit Garg – Intern from IIT-D, India
Charles Rhys Campbell – RAP Student
Leah Ann Ward – RAP Student

Spring 2024
Spring 2023 – Spring 2024
Fall 2023 – Spring 2024
Summer 2023
Fall 2022 – Spring 2023
Fall 2022

PUBLICATIONS & PRESENTATIONS

Summary: 4 journal publications (including 2 under review), 1 research news article, 33 conference presentations, 1 invited talk

Publication Record: Google Scholar

Publications

- Farhang Doost, N., **Yaram, S. D. R.**, Garg, H., Wagner, K., and Srivastava, S. K.; "Bioelectric profiling of Rickettsia montanensis in Vero cells utilizing dielectrophoresis". *J Biol Eng* 19, 18 (2025).
- **Yaram, S. D. R.**, and Srivastava, S. K.; "Microgravity in space may cause cancer – but on Earth, mimicking weightlessness could help researchers develop treatments", *The Conversation US News Article*, 2025.
- **Yaram, S. D. R.**, and Srivastava, S. K.; "Cellular level changes induced in cancer cells due to microgravity: A review", 2024. (Master's Problem Report).
- **Yaram, S. D. R.**, Bostic, A., and Srivastava, S. K.; "Dielectric characterization of yeast cells exposed to microgravity using the dielectrophoretic crossover frequency", 2025. (*In revision, npj Microgravity*).
- **Yaram, S. D. R.**, Bostic, A., Smalley, A., and Srivastava, S. K.; "Simulated microgravity induces rapid dielectric shifts in erythrocytes from pancreatic cancer patients", 2025. (*Submitted to Nature Microsystems & Nanoengineering*).
- **Yaram, S. D. R.**, Farhang Doost, N., and Srivastava, S. K.; "Electrokinetic measurements of dielectric properties of HL-60 cells infected with *Anaplasma* spp.", 2025. (*Pending*).
- **Yaram, S. D. R.**, Smalley, A., and Srivastava, S. K.; "Dielectrophoresis-driven bioparticle manipulation in low-cost microfluidics via xurography", 2025. (*Pending*).
- **Yaram, S. D. R.**, and Srivastava, S. K.; "Microgravity and microfluidics in cancer research: A review of lab-on-a-chip advances in space biology", 2025. (*Pending*).
- Smalley, A., **Yaram, S. D. R.**, and Srivastava, S. K.; "Low-cost fabrication technique for point-of-care applications: A Comprehensive Review", 2025. (*Pending*).
- Rathinam, S., Farhang Doost, N., **Yaram, S. D. R.**, and Srivastava, S. K.; "Integrating Microfluidics in STEM Education Review", 2025. (*Pending*).

Presentations (# - presenting author)

- **Yaram, S. D. R.**[#], and Srivastava, S. K.; "Dielectric Characterization of Yeast Cells Using a Spherical Double Shell Dielectric Model Exposed to Simulated Microgravity" 2025 AIChE Annual Meeting, Boston, MA, USA, November 2-6, 2025. (Oral)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; "Microfluidic Detection Tool for *Anaplasma Spp.* Infections Via Electrokinetics" 2025 AIChE Annual Meeting, Boston, MA, USA, November 2-6, 2025. (Oral)
- **Yaram, S. D. R.**[#], Smalley, A. and Srivastava, S. K.; "Electrokinetic Microfluidics: Affordable Fabrication for the Manipulation of Bioparticles Via Xurography" 2025 AIChE Annual Meeting, Boston, MA, USA, November 2-6, 2025. (Selected for Poster)

- Bostic, A.[#], **Yaram, S. D. R.** and Srivastava, S. K.; "Dielectric Signatures of Red Blood Cells from Pancreatic Cancer Patients Under Simulated Microgravity," 2025 AIChE Annual Meeting, Boston, MA, USA, November 2-6, 2025. (Oral)
- **Yaram, S. D. R.**[#], Bostic, A., and Srivastava, S. K.; "Biophysical characterization of red blood cells from pancreatic cancer patients under simulated microgravity," American Chemical Society (ACS) Fall 2025, Washington DC, USA, August 17-21, 2025. (Oral)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; "Analyzing the bioelectric signatures of healthy and *Anaplasma spp.* infected HL-60 cells" American Chemical Society (ACS) Fall 2025, Washington DC, USA, August 17-21, 2025. (Poster)
- Smalley, A.[#], **Yaram, S. D. R.**, and Srivastava, S. K.; "Electrokinetic Microfluidics: Low-Cost Fabrication for Bioparticle Manipulation and Analysis" American Chemical Society (ACS) Fall 2025, Washington DC, USA, August 17-21, 2025. (Poster)
- Smalley, A.[#], **Yaram, S. D. R.**, and Srivastava, S. K.; "Cell Manipulation in a Low-cost Microfluidic Device using Alternating Current" 18th Annual Summer Undergrad Research Symposium, West Virginia University, WV, USA, July 24, 2025. (Poster) (**People's Choice Best Research Poster - Biological & Biochemical Sciences division**)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; "Dielectric Properties of Cells Under Simulated Microgravity Conditions" 5th International Electronic Conference on Biosensors (IECB 2025), Online, May 26-28, 2025. (Poster)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; "Dielectrophoretic Characterization of HL-60 Cells - Infected with *Anaplasma spp.*," 41st International Symposium on Microscale Separations and Bioanalysis 2025, Arizona State University, Tempe, AZ, USA, May 18-21, 2025. (Oral)
- Bostic, A.[#], **Yaram, S. D. R.**, and Srivastava, S. K.; "Dielectrophoretic Characterization of MIA PaCa-2 Cells Induced due to Simulated Microgravity," 9th Annual Spring Undergrad Research Symposium, West Virginia University, WV, USA, April 24, 2025. (Oral)
- Smalley, A.[#], **Yaram, S. D. R.**, and Srivastava, S. K.; "Fabrication of Inexpensive Microdevices for Bioparticle Separation" 9th Annual Spring Undergrad Research Symposium, West Virginia University, WV, USA, April 24, 2025. (Poster) (**Symposium Winner - Biological & Biochemical Sciences division**)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; "Cellular Biophysical Changes of HL-60 Cells Infected with *Anaplasma spp.*," Student Poster Symposium, Statler College Research Office, West Virginia University, WV, USA, April 11, 2025. (Poster)
- Smalley, A.[#], **Yaram, S. D. R.**, and Srivastava, S. K.; "Design of Low-cost Microdevices: Optimizing Materials," Student Poster Symposium, Statler College Research Office, WVU, April 11, 2025. (Poster)
- Wagner, K.[#], Farhang Doost, N., **Yaram, S. D. R.**, and Srivastava, S. K.; "Modeling Dielectrophoretic Sorting of *Rickettsia montanensis*-Infected and Healthy Vero Cells," Student Poster Symposium, Statler College Research Office, WVU, April 11, 2025. (Poster)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; "Dielectrophoretic Characterization of *Anaplasma spp.* Infection in HL-60 Cells," 12th Annual BioE Day 2025, University of Pittsburgh, PA, USA, March 20, 2025. (Oral) (**Award - Best Podium Presentation**)
- Smalley, A.[#], **Yaram, S. D. R.**, and Srivastava, S. K.; "Fabrication of Inexpensive Microdevices for Bioparticle Separation," 12th Annual BioE Day 2025, University of Pittsburgh, PA, USA, March 20, 2025. (Poster)
- Bostic, A.[#], **Yaram, S. D. R.**, and Srivastava, S. K.; "Cellular Biophysical Changes of Pancreatic Cancer Red Blood Cells Induced due to Simulated Microgravity," WVU 7th Annual Fall Undergrad Research Symposium, Morgantown, WV, December 7, 2024. (Oral)

- Wagner, K.[#], Farhang Doost, N., **Yaram, S. D. R.**, and Srivastava, S. K.; “COMSOL Multiphysics Modeling and Simulations to Sort Healthy and Rickettsia montanensis-Infected Vero Cells,” WVU 7th Annual Fall Undergrad Research Symposium, Morgantown, WV, December 7, 2024. (Poster)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; “Dielectric Behavior of Cells Exposed to Simulated Microgravity,” AES Annual Meeting in conjunction with 51st SciX, Raleigh, NC, USA, Oct 20-25, 2024. (Oral)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; “Characterizing HL-60 Cells Infected with Anaplasma spp.: A Dielectrophoresis Approach,” AES Annual Meeting in conjunction with 51st SciX, Raleigh, NC, USA, Oct 20-25, 2024. (Poster) (**Award - 1st place**)
- Bostic, A.[#], **Yaram, S. D. R.**, and Srivastava, S. K.; “Cellular Biophysical Changes Induced due to Simulated Microgravity Environment,” AES Annual Meeting in conjunction with 51st SciX, Raleigh, NC, USA, Oct 20-25, 2024. (Poster) (**Award - 3rd place**)
- Pathak, A.[#], **Yaram, S. D. R.**, Farhang Doost, N., Srivastava, S. K.; “Optimizing Xurography Techniques to Produce Economical Microfluidic Devices,” AES Annual Meeting in conjunction with 51st SciX, Raleigh, NC, USA, Oct 20-25, 2024. (Poster)
- Wagner, K.[#], Doost, N. F., **Yaram, S. D. R.**, Srivastava, S. K.; “Simulating Separation of Healthy Vero Cells from those Infected with Rickettsia montanensis Using COMSOL Multiphysics,” AES Annual Meeting in conjunction with 51st SciX, Raleigh, NC, USA, Oct 20-25, 2024. (Poster)
- Wagner, K.[#], Doost, N. F., **Yaram, S. D. R.**, Srivastava, S. K.; “Separation of Healthy Vero Cells from Rickettsia montanensis-Infected Cells Using COMSOL Multiphysics,” 17th Annual Summer Undergrad Research Symposium, WVU, July 25. (Poster)
- Bostic, A.[#], **Yaram, S. D. R.**, and Srivastava, S. K.; “Dielectric Characterization of Red Blood Cells Under Simulated Microgravity,” 17th Annual Summer Undergrad Research Symposium, WVU, July 25. (Poster)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; “Biophysical Characterization of HL-60 Infected with Anaplasma spp.,” DEP 2024 (Virtual), Dublin, Ireland, July 1-3, 2024. (Oral)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; “Dielectric Characterization of HL-60 Infected with Anaplasma spp.,” 9th NISBRE 2024, Washington Hilton, DC, USA, June 16-19, 2024. (Poster)
- Bostic, A.[#], **Yaram, S. D. R.** and Srivastava, S. K.; “Dielectric Characterization of HL-60 Cells under Microgravity,” 9th NISBRE 2024, Washington Hilton, DC, USA, June 16-19, 2024. (Flash Talk) (**Award - NISBRE 2024 Merit Award**)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; “Dielectric Characterization of Erythrocytes under Simulated Microgravity,” SSPI Mid-Atlantic Chapter 2024, McLean, VA, April 27, 2024. (Oral)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; “Dielectric Characterization of Various Cells under Simulated Microgravity,” 11th Annual BioE Day, University of Pittsburgh, PA, April 18, 2024. (Poster)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; “Analyzing the Dielectric Properties of Yeast Cells in a Microgravity Environment,” 14th Annual PSRS Conference 2023, Duquesne University, Pittsburgh, PA, December 2, 2023. (Oral)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; “Dielectric Characterization of Various Cells under Microgravity,” AES FACSS SciX 2023, Sparks, NV, October 8-13, 2023. (Oral)
- Oladokun, R., **Yaram, S. D. R.**[#], Eubank, T., and Srivastava, S. K.; “Dielectric Characterization of Ductal Adenocarcinoma using Murine PyMT+/- Model,” AES FACSS SciX 2023, Sparks, NV, October 8-13, 2023. (Poster)
- **Yaram, S. D. R.**[#], and Srivastava, S. K.; “Human Red Blood Cells’ Dielectric Characterization in Microgravity,” 10th Annual BioE Day, University of Pittsburgh, PA, April 6, 2023. (Poster)

- **Yaram, S. D. R.[#]**, and Srivastava, S. K.; “Human Red Blood Cells’ Dielectric Characterization in Microgravity,” 2nd Annual Research Symposium, WVU, March 24, 2023. (Poster)

LEADERSHIP & VOLUNTEERING EXPERIENCE

West Virginia University - MESA Lab|*Graduate Mentor*

Aug 2022 – Present

- I mentored 13 undergraduates and 4 high school students in our lab, guiding projects that received conference awards. Additionally, I designed the lab’s logo and outreach flyers for the MESA lab at WVU.

West Virginia University Cricket Club - Women|*Team Captain*

Dec 2023 – Present

- encouraged fellow women to join the team, and coached new members. Runner-up in the SEWA women’s outdoor cricket tournament for fundraising in 2024.

Indian Institute of Chemical Engineers (IChE) |*President*

March 2021 – July 2022

- As the President of the IChE OUCT Student Chapter, I facilitated submitting abstracts and enrolling 60 students in various conferences. I actively supported their participation in poster and oral presentations, ensuring their engagement and representation in academic forums.

West Virginia University - iServe|*Student Volunteer*

Aug 2024 – Present

- Actively volunteering through iServe WVU with over 28 hours contributed to date, supporting a range of community initiatives including children’s literacy programs, health seminars, hospitality services, and trail clean-up efforts.

Heartfulness Institute |*Design Volunteer*

May 2012 – Current

- Volunteering with the Heartfulness Meditation Institute since 2012, I have supported the Northern Virginia Branch’s Social Media and Design team by creating graphics for social media, email headers, newsletters, flyers, brochures, logos, and Google ad banners. I also contributed to video production for international events and community welfare initiatives. Additionally, I led a team to strategize social media outreach promoting yoga and meditation among youth worldwide and helped raise funds for India’s most advanced dog shelter at the global headquarters, Kanha Shanti Vanam, Hyderabad.

TEACHING EXPERIENCE

- University Teaching Certificate (in process)
- Teaching Assistant for **BMEG 315**, West Virginia University — Spring ’25
- Conducted Microfluidics Lab for **BMEG 315**, West Virginia University — Spring ’25
- Supported **Medical Device Innovation & Design** course development for Dr. Srivastava