Shafqat F. Ehsan

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Professional Summary

- PhD candidate in Systems Biology with 3+ years of cancer biology and computational biology experience.
- Proficient in integrative multi-omics analyses, functional genomics, biomarker discovery, and machine learning–based predictive modeling; experienced in CRISPR/Cas9 screening, CyTOF, and NGS pipeline development.
- Seeking Systems Biology Scientist roles in hybrid wet and dry lab settings.

Technical Skills

- **Data Analysis:** Single-cell RNA-seq, bulk RNA-seq, whole-exome/genome sequencing (WES/WGS), single-cell proteomics (CyTOF), multi-omics integration
- **Programming & Software:** Python, R, C, Bash, Unix/Linux, Git, high-performance computing (HPC)
- **Lab Techniques:** CRISPR/Cas9 screening, aseptic cell culture, PCR, Western blot, NGS library preparation

Education

PhD in Quantitative Sciences - Systems Biology 08/2022 – Present
UT MD Anderson UTHealth Houston GSBS, Houston, TX

BSc (Hons) in Bioinformatics 08/2018 – 05/2022
St. Mary's University, San Antonio, TX (Minor: Biology)

Work Experience

Graduate Student Researcher 05/2023 – Present
UT MD Anderson Cancer Center, Houston, TX
Mentors: Lauren Colbert, MD, MSCR & Loukia Karacosta, PhD

- Identified 1,145 key tumor-specific mutations from longitudinal whole-exome sequencing (WES) using noninvasive cytobrush samples, informing therapy adaptation.
- Conducted genome-scale CRISPR/Cas9 knockout screens with custom gene library and applied precise gain-of-function knock-in editing to validate radioresistance drivers via clonogenic survival assays.
- Mapped resistant cell subtypes with high-dimensional protein profiling (CyTOF), revealing a distinct subpopulation associated with treatment failure.
- Built a predictive response model by combining tumor mutation and single-cell protein data.

Undergraduate Student Researcher 08/2020 – 05/2022
St. Mary's University, San Antonio, TX
Mentor: Erika Schwarz Taylor, PhD

- Identified sxtA gene cluster as potential species-specific probe for toxic algae detection through comparative genomics

CPRIT-CURE Summer Undergraduate Research Fellow 06/2021 – 08/2021
UT MD Anderson Cancer Center, Houston, TX
Mentor: Robert C. Bast, MD

- Investigated FGFR inhibition by infigratinib as an ovarian cancer therapeutic; contributed to experimental design and data analysis

Undergraduate Student Researcher 08/2018 – 07/2020
St. Mary's University, San Antonio, TX
Mentor: Verónica Contreras-Shannon, PhD

- Studied mechanical pressure effects on -tubulin isoform expression in mouse models; presented findings at institutional symposium

Summer Student Researcher 05/2019 – 07/2019
Bowling Green State University, Bowling Green, OH
Mentors: Mikhail Zamkov, PhD; Dmitriy Khon, PhD

- Synthesized colloidal quantum dot alloys via digestive ripening; co-authored Nano Letters publication

Publications

- Bhattacharyya, S.(*), Ehsan, S.(*), Karacosta, L. G. (2023). Phenotypic Maps for Precision Medicine: A Promising Systems Biology Tool for Assessing Therapy Response and Resistance at a Personalized Level. *Frontiers in Network Physiology*, 3, 1256104.
- Cassidy, J., ... Ehsan, S., ... Zamkov, M. (2021). Tuning the Dimensionality of Excitons in Colloidal Quantum Dot Molecules. *Nano Letters*, 21(17), 7339–7346.
- Ehsan, S. F. (2022). Identifying Molecular Markers for Early Detection of Toxic Cyanobacteria and Dinoflagellate (Honors Thesis).
  (*)co-first author

Conference Abstracts

- Ehsan, S. F., Wang, R., Colbert, L. E. (2024). DDR pathway genes in CRT resistance: Insights from longitudinal WES in cervical cancer. *Cancer Research*, 84(1 Suppl), A029.
- Bhattacharyya, S., ... Ehsan, S. F., ... Karacosta, L. G. (2023). Mapping therapy-resistant phenotypes in SCLC liquid biopsies with single-cell proteomics. *Molecular Cancer Therapeutics*, 22(12 Suppl), LB_B05.
- Ehsan, S. F., Santiago-O'Farrill, J. M., Lu, Z., Bast, R. C. (2021). FGFR as a potential target for eliminating dormant autophagic ovarian cancer cells.

Awards & Fellowships

- GSBS Student Travel Award, AACR Conference (2023–24)
- QS Student Travel Award, AACR Conference (2023–24)
- Runner-Up, Pre-Candidacy Poster, QS Retreat (Apr 2024)
- Baggini Scholar Fellowship, St. Mary's University (2021–22)

Presentations & Leadership

Invited Talks

- SPDR Seminar, MD Anderson Cancer Center (02/2025): Mutational signatures of Cervical Cancer and their relation to CRT Resistance
- GYN Seminar, MD Anderson Cancer Center (01/2024): Genetic Determinants of CRT Resistance

Leadership Roles

- Student Representative, QS Steering Committee, UT MD Anderson UT Health Houston GSBS (2024–25)
- Student Member, QS Student Council, UT MD Anderson UT Health Houston GSBS (2023–24)
- Co-founder & President, Ready, SET, Research!, St. Mary's University (2019–22)

Professional Development

Professional Certificate

- Issued by IBM: Data Science Professional Certificate (2025)
- Issued by University of Maryland - Robert H. Smith School of Business: AI and Career Empowerment Certificate (2025)
- Issued by University of Maryland Global Campus: Maryland LEAD- Ethical Leadership (2025)
- Issued by National Association of State Boards of Accountancy (NASBA): Entrepreneurship Foundations (2025)

References

- Lauren Colbert, MD MSCR (lcolbert@mdanderson.org)
- Loukia Karacosta, PhD (lgkaracosta@mdanderson.org)
- Robert Bast Jr. MD (rbast@mdanderson.org)