Syeda Maryam Azeem, Ph.D.

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PERSONAL SUMMARY

Experienced and proactive researcher with 8+ years in oncology-focused drug discovery, combining expertise in protein crystallography and structure-based drug design with cell-based assay development. Skilled in high-throughput screening, with expertise in biophysical methods, molecular and cellular biology techniques both *in vitro* & *in vivo* to support drug discovery, pharmacology to study target mechanistic biology and validate small molecule inhibitors. Demonstrated ability to independently design, execute, and interpret multidisciplinary experiments with scientific rigor and attention to detail. Known for collaborative teamwork, strong problem-solving skills, and operational efficiency in fast-paced research environments.

RESEARCH POSITIONS

Research Assistant – *Mahajan Lab, City University of New York | Aug 2020 – Aug 2025*

- **Pioneered the establishment of the laboratory as the first hire**, developing foundational workflows and experimental pipelines, overseeing equipment installation, optimizing protocols, and ensuring compliance with safety standards.
- Designed, executed, and interpreted experiments independently using molecular and cellular biology techniques. Managed multiple cancer cell lines, including patient-derived xenograft cell models.
- Developed and optimized high-throughput assays to evaluate drug efficacy and mechanisms of action.
- Conducted drug synergy experiments for KRAS inhibitors improving drug efficacy for therapeutic implications.
- Collaborated on experimental design, data visualization, and presenting findings in team settings.
- Read and interpreted scientific literature to propose innovative solutions addressing complex biological questions, contributing to peer-reviewed articles, internal reports, and scientific presentations.
- Maintained detailed documentation in laboratory notebooks and internal study reports.
- Worked collaboratively with cross-functional teams and external teams to reach project milestones on time.

Research Assistant – *Daniel Keedy Lab, CUNY ASRC- Structural Biology Initiative | Jun 2018 – Aug 2020*

- **Helped building a new laboratory from inception**, leading workflow design, equipment installation, and protocol optimization, and safety compliance. Mentored three undergraduate students and two Ph.D. rotation students.
- Served as co-manager of a shared Macromolecular Crystallization Facility, training peers, equipment installation, calibration and maintaining instrumentation.
- Conducted large-scale bacterial culture, protein expression, purification using AKTA Pure systems, and implemented multi-dimensional purification strategies.
- Developed crystallization screens, techniques, including *in-situ* and co-crystallization and *in-situ* data collection, seeding, and soaking, and optimized over 200 protein crystals for X-ray crystallography.
- Extensive experience in high-throughput fragment screening of 240 compounds using various biophysical techniques.
- Acquired training in cutting-edge robotics for crystallization workflows to enhance efficiency and reproducibility.
- Co-authored and edited scientific manuscripts and abstracts on structure-guided drug discovery, supporting collaborative industry projects involving protein crystallography, NMR, and MST data.

Graduate Research Assistant – *Kathleen Frey Lab, Long Island University | May 2016 – May 2018*

- **Established core laboratory infrastructure as the inaugural team member**, including equipment setup, workflow development, protocol optimization, and safety compliance.
- Developed a computational framework to predict HIV reverse transcriptase (RT) resistance mutations against treatment drugs using molecular docking and dynamics simulations (Schrodinger Suite).
- Designed and validated structure-based drug resistance models by integrating protein-ligand interaction analysis.
- Extensive experience in protein expression, purification, and crystallization, supporting structural studies of HIV RT.

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- Conducted X-ray crystallography experiments at the NSLS-II synchrotron at Brookhaven National Lab.
- Published my initial first-author peer-reviewed article in Journal of Molecular Graphics on predictive computational methods for HIV RT drug resistance.

Graduate Assistant – *International Drug Information Center, Long Island University | May 2016 – May 2018*

- Trained PharmD students in scientific literature analysis and database navigation (PubMed, Lexicomp, Micromedex), enhancing their ability to source and interpret evidence for clinical queries. Maintained up-to-date archives of pharmaceutical journals and supported faculty in educational activities, manuscript review, and exam proctoring.

PEER-REVIEWED PUBLICATIONS

1. Jung O, Rajasekhar VK, **Azeem SM (co-first author)**, et. al. Repurposing riluzole as an anti-osteosarcoma agent. Front Oncol. 2025
2. The Atomwise AIMS Program. Wallach, ..., DA Keedy, ..., KS Smith, ..., N Singh, ..., S Hossain, ..., S Dzhumaev, ..., **SM Azeem**, ..., T Mehlman, ..., VA Woods, ..., A Heifets (688 total authors). AI is a viable alternative to high throughput screening: a 318-target study. Sci Rep. 2024
3. Mehlman TS, Biel JT, **Azeem SM**, Nelson ER, et. al. Room-temperature crystallography reveals altered binding of small-molecule fragments to PTP1B. eLife. 2023
4. Raghubir M, **Azeem SM**, et. al. Riluzole-induced apoptosis in osteosarcoma is mediated through Yes-associated protein upon phosphorylation by c-Abl Kinase. Sci Rep. 2021
5. Tabassum T, **Azeem SM**, et. al.. Application of structure-based methods to analyze resistance mutations for chemically diverse non-nucleoside reverse transcriptase inhibitors. Curr HIV Res. 2020
6. **Azeem SM**, et. al. Structure-based methods to predict mutational resistance to diarylpyrimidine non-nucleoside reverse transcriptase inhibitors. J Mol Graph Model. 2018

PROFESSIONAL DEVELOPMENT

Design and Management of Cancer Clinical Trials Course – University of Miami, FL, USA	*Oct 2025*
The Jackson Laboratory and ACS Cancer Course	*Aug 2025*
Certified Peer Review Course - Elsevier Research Academy	*Jun 2025*
Medical Communication Certificate Course - NYU Grossman School of Medicine, NY, USA	*Feb 2025*
Teaching and Learning Center Summer Workshop – The Graduate Center CUNY, NY, USA	*Aug 2021*

AWARDS AND ACHIEVEMENTS

1. Served as a Science Panelist for STEM day at Weill Cornell Medicine (May 2025)
2. Served as a AACR Member Judge for Terra North Jersey STEM Fair at Kean's University, USA (Mar 2025)
3. Pre-pilot TUFCCC/HC U54 grant Award# U54 CA221704(5) from NCI and NIH (Jun 2024)
4. Doctoral Student Research Grant from City University of New York USA (Mar 2024)
5. Early Research Initiative Pre-Dissertation Science Research Award, USA (Mar 2022)
6. Doctoral Student Research Grant from City University of New York USA (Mar 2022)
7. Served as a Brand Ambassador for BioRender for three initial months at CUNY (2021)
8. CUNY Science Scholarship recipient awarded by The Graduate Center CUNY (2020-2025)
9. Performed multi-temp X-ray crystallography at Diamond Light Source, UK (Jul 2019)
10. Performed X-ray Crystallography at NSLS-II Brookhaven National Lab USA (Mar 2018)
11. Graduate Scholar Award from Long Island University, USA. (2015-2018)
12. Graduate Assistant Scholarship from Long Island University, USA. (2016-2018)

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13. Overseas Scholarship Award from Telangana Government, India. (2015-20170
14. Awarded 2nd Place Poster Presentation at National Level Technical Fest, India. (Aug 2012)
15. Awarded Science Secretary position in St. Marks Boys Town High School, India. (2006-2008)

PEER-REVIEWER ROLE

- **Dove Medical Press – Taylor & Francis Group**
  - Journal of Cancer Management and Research
  - Journal of Pediatric Health Medicine and Therapeutics
  - Journal of Infection and Drug Resistance
  - Journal of Orthopedic Research Reviews
  - Journal of Multidisciplinary Healthcare
- **Science Publishing Group**
  - Cancer Research Journal
- **PLOS**
  - Journal of Computational Biology

EDUCATION

Ph.D. in Biology	City University of New York, NY, USA	*Aug 2020 – Aug 2025*
M.Phil. in Biology	City University of New York, NY, USA	*Aug 2020 – Jun 2023*
M.S in Pharmacology	Long Island University, NY, USA	*Sep 2015 – May 2018*
B.S. in Pharmacy	Osmania University, Hyderabad, India	*Oct 2010 – Apr 2014*

RESEARCH SKILLSET

Molecular Biology Techniques:

- DNA, RNA extraction and purification
- Protein purification using AKTA Pure FPLC
- SDS PAGE & DNA Gel and Western Blot
- Primer design and PCR, qPCR, Site-directed mutagenesis
- Spectrophotometric, kinetic and end-point assays
- Chromatin Immunoprecipitation (ChIP)

In Vitro Techniques:

- Mammalian and Patient Derived Xenografts
- Cell Migration Assay, Luciferase Assays
- Transfection, Lentiviral packaging and shRNA delivery
- Fluorescence staining and imaging; TUNEL assay

In Vivo Techniques:

- Mice handling, Oral gavage, subcutaneous, & I.P
- IVIS imaging and Necropsy

Structural Biology Techniques:

- Multi-temperature X-ray Crystallography
- Crystal optimization, compound soaking, harvesting
- Crystallization and imaging robots (ARI Gryphon, Formulatrix Imager, Mosquito, DragonFly)
- Microscale Thermophoresis, NMR, ITC
- OpenTrons-2 and Labcyte Echo65

Computer Skills:

- Brightspace, Blackboard, andTurnitin
- Synergy Finder, Schrodinger Suite, PyMol and Coot
- GraphPad Prism and IBM SPSS software
- ImageJ, QuPath, Chem-Draw Ultra and GIMP, BioRender and Benchling

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TALKS AND POSTERS

Talks

- Investigating the role of EGR1 in Riluzole-treated osteosarcoma models. Presented during MIB Agents Visit with osteosarcoma patients and their parents (2025)
- Repurposing Riluzole for the treatment of osteosarcoma. CUNY Hunter College Research Symposium (2023)
- Investigating the role of EGR1 in osteosarcoma. Panelist at MIB FACTOR Conference (2023) YouTube Video

Posters

- EGR1 mediates Riluzole induced Apoptosis in Osteosarcoma cells Via Yap/p73-Bax Signaling Axis. **SM. Azeem**, S. ChandThakuri, PP. Rao, T. Abbasi, J. McFarlane, S. Porshe, VK. Rajasekhar, JH. Healey, SS. Mahajan. TUFCCC 7th Annual SPEECH Conference (2025)
- Investigating the Effects of Riluzole on EGR1 Expression in Osteosarcoma Cells. J. McFarlane, **SM. Azeem**, SS. Mahajan. Research Conference Hunter College (2025)

- The effect of the KRAS mutation on a redox signaling pathway in osteosarcoma. B. Norton, **SM. Azeem**, SS. Mahajan. STEM Conference Hunter College CUNY (2024)
- Investigating EGR1 downstream targets in osteosarcoma. T. Abbasi, **SM. Azeem**, SS. Mahajan. STEM Conference Hunter College CUNY (2023)
- Synergetic Inhibition of KRAS Mutant Osteosarcoma Using Riluzole and Novel KRAS G12S inhibitor G12Si-5. SS. Pallas, **SM. Azeem**, LJ. Ash, D. Lam, SS. Mahajan, and AL. Wolfe. ABRCMS Conference (2023)
- Perturbing Protein And Ligand Conformational Landscapes To Link Dynamics And Function In PTPs. T. Mehlman, L Margent, A Ebrahim, V Woods, N Singh, B Riley, **SM Azeem,** D. Keedy. Protein Science Conference (2023)
- Hydrogen-Deuterium Exchange (HDX) And X-Ray Crystallography Reveal Novel Mechanisms Of Allosteric Modulation In PTP1B. V. Woods, T Mehlman, **SM. Azeem**, S Hossain, N Singh, D. Keedy. Protein Science Conference (2023)
- Molecular basis for response to Riluzole. **SM. Azeem**, S. ChandThakuri, O. Jung, SS. Mahajan. MCD-CNC Retreat Poster/Talk at ASRC CUNY (2022)
- Remote control of a dynamic enzyme by leveraging small-molecule fragments. T. Skaist**, SM. Azeem**, D. Keedy. Abstracts Of Papers Of The American Chemical Society 257 (2019)
- Investigating strategies to develop potential treatment for metastatic osteosarcoma. M. Raghubir, **SM. Azeem**, S. ChandThakuri, SS. Mahajan. Cold Spring Harbor Labs Symposium (2021)
- Allosteric modulation of the multi-conformer enzyme Protein Tyrosine Phosphatase 1B. T Mehlman, **SM. Azeem**, S Hossain, H. Orins, D. Keedy. CUNY Biophysics Symposium (2019)
- Exploiting the Components Leading to Mutational and Flexible Non-nucleoside Reverse Transcriptase Inhibitors (NNRTIs). **SM. Azeem**, AN. Muwonge, M. Ivatarov, M. Yunayev, KM. Frey. The FASEB J Published April (2018)
- Predicting Resistance To Investigational Microbicide MIV-150 Using Structure-based methods and Fluorescence Enzyme Inhibition. AN. Muwonge, **SM. Azeem**, KM. Frey. The FASEB Journal (2018)
- Prospective Evaluation of Preclinical-HIV Agents for Mutational Resistance. **SM. Azeem**, KM. Frey. AACP Annual Meeting (2018)
- Predicting Resistance Mutations in HIV Reverse Transcriptase. **SM. Azeem**, KM. Frey. Drug Discovery & Therapy World Congress. Boston (2016).

TEACHING AND MENTORING EXPERIENCE

Mentorship as a Ph.D. Scholar *Hunter College, CUNY | Aug 2021 – Aug2025*

- **Mentored three senior undergraduate students across diverse disciplines** (Medical Laboratory Sciences, Biochemistry, and Human Biology) providing individualized academic and research guidance.

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- **Trained junior staff in the lab** guiding them through day-to-day lab tasks and setup, also setting up experiments and lab equipment maintenance.
- **Supervised and mentored two students on Honors Thesis projects**, focusing on original research, experimental design, and data interpretation, fostering their development as independent scientific thinkers.
- **Encouraged interdisciplinary collaboration** and supported students in preparing poster and oral presentation materials and thesis documentation aligned with academic standards.

Graduate Teaching Assistant *Hunter College, CUNY | Aug 2021 – Aug2025 Clinical Biochemistry Labs*

- **Designed and delivered undergraduate-level course in clinical biochemistry**, emphasizing biochemical pathways, disease biomarkers, and diagnostic applications.
- **Created and implemented hands-on laboratory exercises** to teach students enzyme kinetics, protein assays, metabolic profiling, and biochemical diagnostic methods.
- **Assessed lab reports and case studies** with a focus on accuracy, clarity, and integration of biochemical principles into clinical contexts.
- **Mentored students in independent and group research projects**, guiding experimental design, data interpretation, and presentation of results in a publication-style format.
- **Promoted critical thinking and applied problem-solving** by connecting biochemical principles to clinical case scenarios and patient-centered learning.

Graduate Teaching Assistant *Hunter College, CUNY | Aug 2021 – Aug2025 Cell and Tissue Culture Labs*

- **Designed and delivered interactive sessions in cell and tissue culture**, disease mechanisms, and pharmacology, ensuring concepts were accessible and relevant for undergraduate learners.
- **Developed course materials** including protocols, lab manuals, and experimental demonstrations, integrating best practices in aseptic technique, culture maintenance, experimentation and microscopy.
- **Evaluated student lab reports, oral presentations, and experimental results** with emphasis on accuracy, critical analysis, and effective scientific communication.
- **Mentored undergraduate students through hypothesis-driven projects**, guiding experimental design, troubleshooting, and data interpretation to strengthen problem-solving and independent research skills.
- **Fostered a collaborative learning environment by encouraging peer-to-peer discussions**, integrating active learning strategies, and promoting adherence to rigorous scientific standards.

PROFESSIONAL ASSOCIATIONS

American Association for Cancer Research – *Associate Member* (2022-present)
New York Academy of Sciences (2021-present)
American Society of Pharmaceutical and Experimental Therapeutics (2016-2019)
American Association of Pharmaceutical Scientists – *Student Chapter* (2015-2018)