

Yogeshwari Singh, Ph.D., MBA

Molecular Biologist | Protein/RNA Biochemist | Bioanalytical Researcher
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PROFESSIONAL SUMMARY

Molecular biologist and protein biochemist with 8 years of hands-on research experience spanning molecular biology, cell based experimentation, protein characterization, nucleic acid analysis, and assay development. Proven track record designing and executing PCR/qPCR/digital PCR, antibody-pair, flow cytometry, and biochemical assays, troubleshooting complex experimental workflows, and translating multidimensional datasets into mechanistic biological findings. Experienced working with mammalian cancer patient-derived cells at Nemours Children's Health and conducting independent mechanistic research at the University of Delaware. Strong record of experimental design, scientific problem-solving, technical communication, and cross-functional collaboration, with findings contributing to publications and scientific presentations. Seeking to bring rigorous experimental expertise to cell and gene therapy research and preclinical pipeline development.

CORE SKILLS

Molecular & Cell Biology: Molecular cloning (Gibson assembly, restriction/ligation), plasmid construction, mammalian & microbial cell culture, transfection/transduction, flow cytometry, ELISA/immunoassays, Northern blot, Western blot, DNA/RNA extraction, gel electrophoresis

Biophysical & Assay Development: SPR (Biacore), BLI (Octet), MST, fluorescence microscopy, protein-protein interaction, PCR, qPCR, dPCR, RT PCR, enzyme kinetics, hairpin primer construction and troubleshooting.

Data & Scientific Analysis: Protein expression & purification, ÄKTA/FPLC, HPLC, SEC-FPLC, SDS-PAGE, spectrophotometry, X-ray crystallography (Coot/Phenix), LC-MS/MS proteomics, RNA-seq, GraphPad Prism, JMP, SnapGene, Image Lab, PyMOL, quantitative data analysis, statistical analysis

Scientific Communication & Leadership: Technical/scientific writing, manuscript preparation, SOP & protocol development, GLP/GMP-compliant documentation, BSL-2 compliance, laboratory audits & inspection readiness, scientific presentations, laboratory training, mentoring, cross-functional collaboration, project coordination

PROFESSIONAL EXPERIENCE

Ph.D. Researcher, *University of Delaware*

07/2021 – Present

- Directed an independent research project investigating NAD-capped RNA metabolism in *E. coli*, characterizing the decapping enzymes NudC and RppH and establishing their regulation by the stress alarmone ppGpp.
- Developed and published a novel method to quantify RNA-decapping activity, generating reproducible datasets that established mechanistic differences between enzymes.
- Purified recombinant proteins using ÄKTA/FPLC and RNA using HPLC-based workflows, generating high quality biomolecular substrates for downstream biochemical and biophysical studies.
- Developed and optimized the biomolecular interactions assay using SPR (Biacore), Octet BLI, and MST, and trained others to generate quantitative binding measurements that supported mechanistic characterization of protein ligand interactions.
- Solved crystal structures of proteins providing structural insight into substrate recognition and the molecular basis of enzyme inhibition.

Research Assistant, *Nemours Children's Health*

01/2021 – 06/2021

- Maintained and processed HSCs, iPSCs, and cancer patient-derived cells in a GMP-regulated translational research environment, supporting reproducible cell-based studies for pediatric oncology.
- Developed and executed 2D/3D co-culture assays and characterized cellular responses using flow cytometry and imaging-based analysis to investigate chemoprotection and drug resistance.
- Performed IC50 and dose-response analyses to quantify cytotoxic drug activity, generating data used to evaluate compound efficacy and inform compound prioritization.

Teaching Assistant, *University of Delaware*

08/2021 – 05/2026

- Mentored undergraduate researchers in molecular biology, protein biochemistry, experimental design, and laboratory techniques, improving technical consistency and independent experimental execution.
- Trained 100+ students, teaching molecular biology techniques, accurate experimental execution, data interpretation, and laboratory documentation.

Molecular Biology Technician, *State Virology Laboratory*

02/2020 – 05/2020

- Performed RT-PCR testing on clinical samples during COVID-19 diagnostic operations, generating molecular testing results while following standardized biosafety and quality procedures.
- Processed biological samples and maintained traceable testing documentation in a high-throughput molecular diagnostic environment

Master's & Undergraduate Research, *Barkatullah University*

05/2015 – 05/2020

- Investigated sigma-factor regulation in *Mycobacterium smegmatis* to characterize transcriptional mechanisms underlying multidrug resistance and bacterial survival under antimicrobial stress.
- Investigated phytochemical extraction from medicinal plants and characterized bioactive compounds to evaluate their potential antimicrobial and therapeutic properties.

EDUCATION**Ph.D. in Biological Sciences**

University of Delaware, Newark, DE — 2026

Master of Business Administration

University of Delaware, Newark, DE — 2025

Master's in Microbiology

Barkatullah University, Bhopal, India — 2020

PUBLICATIONS

1. Singh Y, Bird JG. A gel electrophoresis-based assay for measuring enzymatic RNA decapping activity. *Methods Enzymol.* 2022; 675:323-350. doi: 10.1016/bs.mie.2022.07.014
2. Das K, Singh Y, et al. E. coli helicase CsdA as NAD-RNA binding protein. DOI: 10.64898/2026.06.03.730015
3. Singh Y, et al. RppH functions as an NAD-decapping enzyme regulated by ppGpp. Manuscript in preparation (JBC).
 - 3 additional manuscripts in preparation.
 - Presented research at 8 international and 5 national/regional conferences.

AWARDS & RECOGNITION

- Delaware INBRE Core Facility Award for RNA Sequencing (2025)
- Guest Lecturer, BISC300 — communicated complex microbiology concepts to diverse undergraduates
- Graduate Student Travel Award, University of Delaware (2023, 2025)
- Departmental Professional Development Award, University of Delaware (2023)
- Certified CyberAmbassador (NSF-supported program) — focused on cyber harassment prevention and inclusive research environments (2023)
- Student Organizer, Department Microbiology Group (G3) (07/2023 – 11/2023)
- Executive Board Member, Biological Sciences Graduate Student Association (BGSA) (07/2023 – 11/2023)
- Speaker, University of Delaware Women in STEM club (02/2022)
- Member, Microbiology Society of India (2018 – Present)