Khalid Hasan Raj

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Current Position

Lecturer **May 2026 - Present**
Department of Biochemistry and Molecular Biology, University of Dhaka, Dhaka, Bangladesh

Education

M.S. in Biochemistry and Molecular Biology, University of Dhaka **2025**
Thesis Title: *Hernessing E. coli for cost effective production and purification of a novel pan-serotype multi-epitope vaccine against dengue virus.*
Thesis Supervisor: Professor A.H.M. Nurun Nabi, PhD | **GPA:** 4.00/4.00 | **Rank:** 1/60

B.S. in Biochemistry and Molecular Biology, University of Dhaka **2023**
CGPA: 3.96/4.00 | **Rank**: 1/60

Research Experience

Researcher **May 2026 - Present**
Department of Biochemistry and Molecular Biology, University of Dhaka
- Doing multi-omics bioinformatics projects to develop risk prediction models for stomach and bladder cancer.
- Investigating genetic associations underlying non-communicable diseases.
- Collaborating within multidisciplinary research teams, contributing to data analysis, interpretation, and scientific writing.
- Developing research ideas and preparing research proposals and grant applications.

Research Fellow **October 2025 - May 2026**
International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)
- Conducted mammalian cell culture and virus culture under biosafety-compliant conditions.
- Performed immunological and virological assays.
- Contributed to biosimilar potency testing and support clinical trials of viral vaccines.
- Participated in antiviral drug discovery projects.
- Collaborated in multidisciplinary research teams and contributed to data analysis, interpretation, and scientific writing.

Senior Research Assistant **June 2025 - September 2025**
International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)
- Maintained mammalian cell lines and assisted in virus culture experiments.
- Supported laboratory operations, data collection, and experimental optimization.
- Assisted in training junior researchers and interns in laboratory techniques and safety practices.

MS Thesis Student **September 2023 - June 2025**
Department of Biochemistry and Molecular Biology, University of Dhaka
Thesis Title: *Hernessing E. coli for cost effective production and purification of a novel pan-serotype multi-epitope vaccine against dengue virus.*
- Designed an immunoinformatics-based multi-epitope vaccine targeting all dengue virus serotypes.
- Cloned the vaccine construct gene into an expression vector and expressed it in *E. coli*.
- Optimized induction conditions and purified the recombinant protein using chromatographic techniques.
- Confirmed protein expression and purity by SDS-PAGE and Western blotting.

Publications

Genetic association of vitamin D receptor variants and 25-hydroxyvitamin D levels with breast cancer risk and triple-negative phenotype in Bangladesh
AMowla, A., Mahmud, Z., **Raj, K. H.**, Tamanna, S., Zeba, Z., Ansari, F., & Howlader, M. Z. H. (2026). Genetic association of vitamin D receptor variants and 25-hydroxyvitamin D levels with breast cancer risk and triple-negative phenotype in Bangladesh. *Scientific Reports*. https://doi.org/10.1038/s41598-026-68260-9

A robust comprehensive immunoinformatics approach for designing a potential multi-epitope based vaccine against a reiterated monkeypox virus
Raj, K. H., Hossain, E., Zahin, H., Noman, A. A., Saba, A. A., Sayem, M., Yasmin, T., & Nabi, A. H. M. (2025). A robust comprehensive immunoinformatics approach for designing a potential multi-epitope based vaccine against a reiterated monkeypox virus. *Biochemistry and Biophysics Reports*, 43, 102075. https://doi.org/10.1016/j.bbrep.2025.102075

Comprehensive *in silico* characterization of nonsynonymous SNPs in the human ezrin (EZR) gene and their role in disease pathogenesis
Akter, S., Fuad, M., Mahmud, Z., Tamanna, S., Sayem, M., **Raj, K. H**., & Howlader, M. Z. H. (2025). Comprehensive *in silico* characterization of nonsynonymous SNPs in the human ezrin (EZR) gene and their role in disease pathogenesis. *Biochemistry and Biophysics Reports*, 42, 101972. https://doi.org/10.1016/j.bbrep.2025.101972

Skills

Molecular Biology and Biochemistry: DNA and RNA extraction, PCR, qRT-PCR, gel electrophoresis, molecular cloning and plasmid handling, heterologous protein expression, SDS-PAGE and western blotting.

Cell Culture and Virology: Mammalian cell culture, virus culture, plaque assay, pseudovirus virus neutralization assay (PNA), focus reduction neutralization test (FRNT), biosimilar potency testing and antiviral drug screening.

Immunological Techniques: Enzyme-linked immunosorbent assay (ELISA), neutralization assays and immune response testing.

Bioinformatics: Genomics and transcriptomics data analysis, immunoinformatics-based data analysis, protein structure prediction and mutation analysis, molecular docking, molecular dynamics simulation and machine learning model development.

Programming and data analysis: **R** (biostatistics, visualization, transcriptomics analysis), **Python** (data processing, machine learning algorithms implementation), **Bash** (Linux-based data handling and pipeline execution).

Research skills: Experimental design and optimization, data interpretation and statistical analysis, scientific writing (manuscripts, theses, proposals), research presentation and seminar delivery.

Teaching and academic instruction: Undergraduate and graduate course delivery (Biochemistry, Bioinformatics, Molecular Biology, Nutrition), lecture and laboratory module design, assessment preparation and script evaluation, student research supervision and thesis advising, departmental curriculum committee participation.

Awards and Fellowship

- **National Science and Technology (NST) Fellowship - 2024**
- **Provost Award - 2023, Amar Ekushey Hall, University of Dhaka**
- **Provost Award - 2022, Amar Ekushey Hall, University of Dhaka**
- **Dean’s Award - 2022, Faculty of Biological Sciences, University of Dhaka**
- **Dhaka University Honors Scholarship - 2022**

References

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