

Md. Imran Hasan

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ACADEMIC CREDENTIALS

Aug 2025- **Doctor of Philosophy (PhD)**
Ongoing Department of Biological Science
Purdue University - West Lafayette, IN, USA

Aug 2023- **Master of Science (M.S.)** **CGPA: 4.00/4.00**
May 2025 Department of Biology
Faculty of the College of Arts and Sciences,
Texas A&M University – San Antonio, USA.

- **Master's Thesis:** A computational system biology approach for unveiling novel drug targets in *staphylococcus aureus*.

Jan 2016 – **Bachelor of Science (B.Sc.)** **CGPA: 3.32/4.00**
Jul 2020 Department of Computer Science and Engineering
Faculty of Engineering and Technology,
Islamic University, Bangladesh. **Total credit hours: 160**

- **Bachelor's Project:** Galangin for COVID-19 and Mucormycosis co-infection: a potential therapeutic strategy of targeting critical host signal pathways triggered by SARS-CoV-2 and Mucormycosis.

NOTABLE PUBLICATIONS

†EQUAL CONTRIBUTION

Md. Imran Hasan, Davida S. Smyth, and Ashley I. Teufel (2025): *Network Analysis of Antimicrobial Resistance in Staphylococcus aureus: Characterization of Hub Genes and Their Functional Implications*. **NAR Genomics and Bioinformatics**. DOI: [10.1093/nargab/lqaf147](https://doi.org/10.1093/nargab/lqaf147); [IF: 2.8; Q1]

Md Imran Hasan, Srinivas Mummidi, and Ashley Teufel (2025): *Integrative Single-Cell Transcriptomic Analysis Reveals Key Biomarkers, Regulatory Networks, and Novel Drug Candidates in HIV Infection*. **Virology Journal**. DOI: [10.1186/s12985-025-03030-z](https://doi.org/10.1186/s12985-025-03030-z); [IF: 3.8; Q1]

Arju Hossain, Asif Ahsan, **Imran Hasan**, Sohel, Arif Khan, Pratul Dipta Somadder, Sumaiya Monjur, Sipon Miah, KM Kaderi Kibria, Kawsar Ahmed, and Habibur Rahman (2024): *Screening out molecular pathways and prognostic biomarkers of ultraviolet-mediated melanoma through computational techniques*. **The International Journal of Biological Markers**. DOI: [/10.1177/03936155241230968](https://doi.org/10.1177/03936155241230968);

Sadia Afrin Bristy, Md Arju Hossain, **Md Imran Hasan**, SM Hasan Mahmud, Mohammad Ali Moni, and Md Habibur Rahman (2023): *An integrated complete-genome sequencing and systems biology approach to predict antimicrobial resistance genes in the virulent bacterial strains of Moraxella catarrhalis*. **Briefings in Functional Genomics**. DOI: [/10.1093/bfgp/elad005](https://doi.org/10.1093/bfgp/elad005);

Md. Imran Hasan, Md. Arju Hossain, Md Habibur Rahman, Md Sohel, Asif Ahsan, Md. Sadat Hossain Soikot, Md. Nazrul Islam, Mohammad Ruhul Amin, and Deepak Kumar Jain (2023): *Galangin for COVID-19 and Mucormycosis co-infection: a potential therapeutic strategy of targeting critical host signal pathways triggered by SARS-CoV-2 and Mucormycosis*. **Network Modeling Analysis in Health Informatics and Bioinformatics (Springer)**. DOI: [10.1007/s13721-023-00421-6](https://doi.org/10.1007/s13721-023-00421-6); [IF: 2.056]

Md Arju Hossain, Md Habibur Rahman, Habiba Sultana, Asif Ahsan, Saiful Islam Rayhan, **Md Imran Hasan**, Md Sohel, Pratul Dipta Somadder, and Mohammad Ali Moni (2023): *An integrated in-silico Pharmaco-BioInformatics approaches to identify synergistic effects of COVID-19 to HIV patients.* **Computers in Biology and Medicine.** DOI: [10.1016/j.compbimed.2023.106656](https://doi.org/10.1016/j.compbimed.2023.106656);

Md. Arju Hossain, Md Sohel, Md Habibur Rahman, **Md Imran Hasan**, Md. Sharif Khan, Md. Al Amin, Md. Zahidul Islam, and Silong Peng (2023): *Bioinformatics and In silico approaches to identify novel biomarkers and key pathways for cancers that are linked to the progression of female infertility: A comprehensive approach for drug discovery.* **PLOS ONE.** DOI: [10.1371/journal.pone.0265746](https://doi.org/10.1371/journal.pone.0265746); [IF: 3.7; Q1]

Md Arju Hossain, Md Sohel, Tayeba Sultana, **Md Imran Hasan**, Md Sharif Khan, KM Kaderi Kibria, SM Hasan Mahmud, Md Habibur Rahman (2023): *Study of kaempferol in the treatment of COVID-19 combined with Chikungunya co-infection by network pharmacology and molecular docking technology.* **Informatics in Medicine Unlocked.** DOI: [/10.1016/j.imu.2023.101289](https://doi.org/10.1016/j.imu.2023.101289);

Md Imran Hasan, Shahin Ali, Habibur Rahman, and Khairul Islam (2022): *Automated Detection and Characterization of Colon Cancer with Deep Convolutional Neural Networks.* **Journal of Healthcare Engineering.** DOI: [/10.1155/2022/5269913](https://doi.org/10.1155/2022/5269913); [IF: 3.822]

Md. Imran Hasan, Md Arju Hossain, Piplu Bhuiyan, Md Sipon Miah, Md Habibur Rahman (2022): *A system biology approach to determine therapeutic targets by identifying molecular mechanisms and key pathways for type 2 diabetes that are linked to the development of tuberculosis and rheumatoid arthritis,* **Life Sciences**, DOI: [10.1016/j.lfs.2022.120483](https://doi.org/10.1016/j.lfs.2022.120483); [IF: 5.03; Q1]

Nosin Ibna Mahbub[†], **Md. Imran Hasan[†]**, Md Habibur Rahman, Feroza Naznin, Md Zahidul Islam, Mohammad Ali Moni (2022): *Identifying molecular signatures and pathways shared between Alzheimer's and Huntington's disorders: A bioinformatics and systems biology approach.* **Informatics in Medicine Unlocked.** DOI: [10.1016/j.imu.2021.100840](https://doi.org/10.1016/j.imu.2021.100840) [IF: 3.8; Q2]

Md. Imran Hasan, Nosin Ibna Mahbub, Bappa Sarkar: *Identification of Black Fungus Diseases Using CNN and Transfer-Learning Approach.* **ICCA – 2022. ACM Digital Library.** DOI: [10.1145/3542954.3542972](https://doi.org/10.1145/3542954.3542972)

M. Nazmul Hoque, Md. Arif Khan, Md. Arju Hossain, **Md. Imran Hasan**, Md Habibur Rahman, Mahmoud E. Soliman, Yusha Araf, Chunfu Zheng, Tofazzal Islam (2022): *Differential gene expression profiling reveals potential biomarkers and pharmacological compounds against SARS-CoV-2: insights from machine learning and bioinformatics approaches.* **Frontiers in Immunology.** DOI: [10.1101/2022.03.30.486356](https://doi.org/10.1101/2022.03.30.486356) [IF: 7.3; Q1]

Md. Imran Hasan, Md Habibur Rahman, Md Babul Islam, Md Zahidul Islam, Md Arju Hossain, Mohammad Ali Moni (2022): *Systems Biology and Bioinformatics approach to Identify blood based signatures molecules and drug targets of patient with COVID-19.* **Informatics in Medicine Unlocked**, DOI: [10.1016/j.imu.2021.100840](https://doi.org/10.1016/j.imu.2021.100840) [IF: 3.8; Q2]

Md Arju Hossain, Ashik Sharfaraz, **Md Imran Hasan**, Pratul Dipta Somadder, Md Akramul Haque, Md Rifat Sarker, Md Monjurul Alam, Ali Mohamod Wasaf Hasan, Md Sohel, and Md Habibur Rahman (2022): *Molecular docking and pharmacology study to explore bio-active compounds and underlying mechanisms of Caesalpinia bonducella on polycystic ovarian syndrome.* **Informatics in Medicine Unlocked.** DOI: [10.1016/j.imu.2022.101073](https://doi.org/10.1016/j.imu.2022.101073);

Md Arju Hossain, Md Al Amin, **Md Imran Hasan**, Md Sohel, Md Akash Ahammed, SM Hasan Mahmud, Md Rezanur Rahman, Md Habibur Rahman (2022): *Bioinformatics and system biology approaches to identify molecular pathogenesis of polycystic ovarian syndrome, type 2 diabetes, obesity, and cardiovascular disease that are linked to the progression of female infertility.* **Informatics in Medicine Unlocked.** DOI: [10.1016/j.imu.2022.100960](https://doi.org/10.1016/j.imu.2022.100960);

Total peer-reviewed journal publications: 16; Citation Count: 360 (h-index: 10) (i10-index: 11).

RESEARCH EXPERIENCES

Aug 2025- **Research Assistant | Dr. Paschou Lab**

Present Department of Biological Science, Purdue University, West Lafayette, IN-47907, USA.

- **Project 1:** Genetic Architecture of the Shared Genetic Liability of Cardiovascular-Kidney-Metabolic (CKM) Syndrome: A Cross-Ancestry Approach.
 - ◆ Conducted a large-scale cross-ancestry multivariate genome-wide association study of Cardiovascular-Kidney-Metabolic (CKM) syndrome using Genomic SEM, integrating 13 clinical traits to identify more than 250 shared genetic risk loci and characterize tissue-specific genetic enrichment.
 - ◆ Constructed robust post-GWAS analytical pipelines—incorporating partitioned heritability (S-LDSC), fine-mapping, and cross-ancestry polygenic risk scores (PRS)—which successfully differentiated severe Stage 4 CKM patients from healthy Stage 0 individuals in the All of Us cohort.

Supervised by **Professor Dr. Peristera Paschou** [ppaschou@purdue.edu]

Aug 2023- **Research Assistant | Dr. Teufel Lab**

May 2025 Department of Biology, Texas A&M University-San Antonio, TX-78224, USA.

- **Project 1:** An integrated whole-genome sequencing and system biology method predicts antibiotic resistance in the virulent *Staphylococcus aureus* strain.
 - ◆ Analysis of *Staphylococcus aureus* strains identified antimicrobial resistant genes, highlighting key hub genes, drug class, and resistance mechanisms which can be targeted for new therapies.
 - ◆ Functional enrichment of AMR gene networks revealed critical processes and mechanisms related to antibiotic resistance, aiding the development of effective antimicrobial agents and enhancing understanding of *S. aureus* resistance.
- **Project 2:** Unveiling the Molecular Landscape of HIV Infection: Identification of Key Gene Biomarkers and Potential Drug Candidates through Single-Cell RNA Sequencing and Network Based Bioinformatics Approach
 - ◆ Single-cell RNA sequencing identified differentially expressed genes and key pathways in HIV-infected cells, particularly in CD4+ T cell.
 - ◆ Molecular docking studies highlight Hypericin as potential inhibitors of key HIV-related proteins, suggesting new therapeutic avenues.

Supervised by **Professor Dr. ASHLEY I. TEUFEL** [Ashley.Teufel@tamusa.edu]

Jun 2019- **Research Assistant**

Dec 2022 Department of Computer Science and Engineering, Islamic University, Kushtia-7003, Bangladesh.

- **Project 1:** Identifying molecular mechanisms and key pathways that are linked to type 2 diabetes development of tuberculosis and rheumatoid arthritis.
- **Project 2:** Exploring Galangin as a Therapeutic Agent for SARS-CoV-2 and Mucormycosis Co-Infection.
- **Project 3:** Automatic Detection and Characterization of Colon Cancer with Deep Convolutional Neural Networks.

Supervised by **Dr. Md Habibur Rahman** [habib@iu.ac.bd]

Mar 2019- **Research Assistant**

- Aug 2021 • **Project 1:** Identification of blood-based signatures molecules and prediction of drug targets for COVID-19 patient.
- **Project 2:** Diagnosis, Prognosis and Characterise Osteosarcoma with DCNN.

Supervised by **Dr. Mohammad Ali Moni** [m.moni@uq.edu.au]

PROFESSIONAL EXPERIENCE

- June 2024 - Aug 2024 • **Research Assistant (Summer Intern)**, University of Texas Health Science Center at San Antonio, Texas, USA.
- Vaccine effectiveness and immune response of SARS-CoV-2 vaccines in active military personnel (VIRAMP).
 - Integration of miRNA expression, phenotype data, and associated gene data highlights the multi-protective salutogenic traits sustained by optimal immune resilience and providing insights into gene expression signatures associated with lifespan and immune aging.

Supervised by **Professor Dr. Sunil K Ahuja** [Ahuja@uthscsa.edu] | Center for Personalized Medicine

- Aug 2023- May 2025 • **Graduate Teaching Assistant**, Texas A&M University-San Antonio, Texas, USA
- Assist in teaching and mentoring undergraduate students in statistics in biology & medicine classroom, laboratory, or field settings.
 - Grade undergraduate student assignments, exams, and coursework, providing valuable feedback.

PERSONAL DEVELOPMENT

Mar 2024 • **High Performance Computing for Biologist**
Instructed by: Texas A&M University – San Antonio

May 2022 • **Basics to Advanced modules in Multiomics data analysis**
Instructed by: Nextgenhelper, New Delhi.

Sep 2021 • **WHOLE EXOME SEQUENCING (5 Days)**
Instructed by: BDG Lifesciences (OPC) Pvt. Ltd., India.

May 2021 • **NGS | WHOLE GENOME SEQ**
Instructed by: BDG Lifesciences (OPC) Pvt. Ltd., India.

Dec 2020 • **Crush Course on Python**
Instructed by: Google (Coursera).

Nov 2020 • **Google IT Support Professional Certificate (150 hours).**
This five-course specialization covered technical support, bits and bytes of Computer Networking, system administration etc.
Instructed by: Google (Coursera).

TECHNICAL SKILLS

Languages R, Python, C, C++, HTML/CSS, SQL.

Frameworks Scikit, NLP, TensorFlow, Github, Keras.

Dry-Lab Skills GWAS, RNAseq and Microarray Data Analysis, scRNAseq analysis, miRNA analysis, Pathway and Signaling Analysis, Computer-aided Drug Design, Molecular dynamics simulations, Virtual Screening, Protein Modelling, Molecular Docking, Phylogenetic analysis, Whole genome analysis and annotation, Medical Image Analysis.

Tools & Softwares	Schrodinger Suite, Discovery Studio, PyMol, PyRx, AutoDock Vina, Swiss PDB viewer, UCSF Chimera, Cytoscape, Biorender, Galaxy Web, SPSS, Latex, Linux, Mendeley, EndNote.
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ADDITIONAL INFORMATION

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| Presentations | <ul style="list-style-type: none"> • Graduate Oral Presentation- RISE 2025: Network Analysis of Antimicrobial Resistance in Staphylococcus aureus: Characterization of Hub Genes and Their Functional Implications. 3rd Place in Graduate Oral Presentation. • 3 Minute Thesis Presentation, Systems Biology Approach to Identify Drug Targets in Staphylococcus aureus, Texas A&M University – San Antonio, 2024. • Poster Presentation, New Mexico Research Symposium – 2024, Unveiling the Molecular Landscape of HIV Infection: Identification of Key Gene Biomarkers and Potential Drug Candidates through Single-Cell RNA Sequencing and Network Based Bioinformatics Approach. • Oral Presentation (Paper No: 221), International Conference on Innovations in Science, Engineering and Technology 2022 (ICISSET 2022), Bangladesh. [26-27 February 2022] <ul style="list-style-type: none"> - Paper No 221: Machine Learning Approaches to Identify Significant Features for the Diagnosis and Prognosis of Chronic Kidney Disease. • Oral Presentation (Paper No: 56), 2nd International Conference on Computing Advancements - ICCA 2022, Bangladesh. [10-12 March 2022] <ul style="list-style-type: none"> - Paper No 56: Identification of Black Fungus Diseases Using CNN and Transfer-Learning Approach. |
| Awards & Achievements | <ul style="list-style-type: none"> • Lynn Fellowship, Purdue University Interdisciplinary Life Science Program (PULSe), West Lafayette, IN. • University Merit Scholarship, Competitive Graduate Scholarship, Texas A&M University-San Antonio. |
| Organizations | <ul style="list-style-type: none"> • Founding Chair, IEEE Computer Society Islamic University Chapter, Islamic University, Mar 2021 – Dec 2021. • Public Relation Coordinator, IEEE Islamic University Student Branch, Jan 2020 – Dec 2020. • Coordinator, Alorito'30, Islamic University, Jan 2017 – Aug 2021. |