

## Mohammad Kamruzzaman

Lecturer

Department of Biochemistry and Molecular Biology

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### Educational Qualifications

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<b>2016</b>	<b>Master of Science (MS);</b> Biochemistry and Molecular Biology GPA: <b>3.90</b> (out of 4.00) University of Dhaka, Bangladesh <b>Dissertation:</b> Assessment of Oxidative Stress and Antioxidant Defense Systems in Coronary Heart Disease Patients in Bangladesh.
<b>2015</b>	<b>Bachelor of Science (BS);</b> Biochemistry and Molecular Biology CGPA: <b>3.71</b> (out of 4.00) University of Dhaka, Bangladesh
<b>2010</b>	<b>Higher Secondary Certificate (HSC)</b> CGPA: <b>5.00</b> (out of 5.00) New Govt. Degree College, Rajshahi, Bangladesh
<b>2008</b>	<b>Secondary School Certificate (SSC)</b> CGPA: <b>5.00</b> (out of 5.00) P.K.A High School, Naogaon, Bangladesh

### Work Experience

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<b>Sept 2023- Present</b>	<b>Lecturer</b> Department of Biochemistry and Molecular Biology, MBSTU, Tangail-1902
<b>Nov 2022- Aug 2023</b>	<b>Senior Research Officer</b> Mucosal Immunology and Vaccinology laboratory, IDD, icddr,b
<b>Sept 2020- Oct 2022</b>	<b>Research Officer</b> Mucosal Immunology and Vaccinology laboratory, IDD, icddr,b
<b>Jul 2019 – Aug 2020</b>	<b>Research Fellow</b> Massachusetts General Hospital, Harvard Medical School, Boston, USA
<b>Jun 2017- Jul 2019</b>	<b>Research Officer</b> Mucosal Immunology and Vaccinology laboratory, IDD, icddr,b
<b>Jan 2016- Jun 2017</b>	<b>M.S Thesis Student &amp; Research Assistant</b> Department of Biochemistry and Molecular Biology, University of Dhaka

### Publications

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1. **Kamruzzaman, M., Kelly, M., Charles, R. C., Harris, J. B., Calderwood, S. B., Akter, A., ... & Ryan, E. T. (2021).** Defining polysaccharide-specific antibody targets against *Vibrio cholerae* O139 in humans following O139 cholera and following vaccination with a commercial bivalent oral cholera vaccine, and evaluation of conjugate vaccines targeting O139. *mSphere*, 6(4), 10-1128.
2. Kelly, M., Janardhanan, J., Wagh, C., Verma, S., Charles, R. C., Leung, D. T., **Kamruzzaman, M., Pansuriya, R. K., ... & Ryan, E. T. (2024).** Development of a *Shigella* conjugate vaccine targeting *Shigella flexneri* 6 that is immunogenic and provides protection against virulent challenge. *Vaccine*, 42(24), 126263.

3. Bernshtein, B., Kelly, M., Cizmeci, D., Zhiteneva, J. A., Macvicar, R., **Kamruzzaman, M.**, ... & Ryan, E. T. (2024). Determinants of immune responses predictive of protection against shigellosis in an endemic zone: a systems analysis of antibody profiles and function. *The Lancet Microbe*. 100889.
4. Nobel, F. A., **Kamruzzaman, M.**, Jebin, R. A., Uddin, M. N., Ruhee, N. N., Babu, G., & Islam, M. J. (2024). Revealing biomarkers and major pathways between SARS-CoV-2 and SARS-like viruses using transcriptomics analysis. *Human Gene*, 40, 201292.
5. Nobel, F. A., **Kamruzzaman, M.**, Asaduzzaman, M., Uddin, M. N., Ahammad, H., Hasan, M. M., ... & Islam, M. J. (2024). Identification of Differentially Expressed Genes and Protein-Protein Interaction in Patients with COVID-19 and Diabetes Peripheral Neuropathy: A Bioinformatics and System Biology Approach. *Cureus*, 16(4).
6. Dash, P., Hakim, A., Akter, A., Banna, H.A., Kaiser, M.H., Aktar, A., Jahan, S.R., Ferdous, J., Basher, S.R., **Kamruzzaman, M.**, ... & Qadri, F. (2024). Cholera toxin and O-specific polysaccharide immune responses after oral cholera vaccination with Dukoral in different age groups of Bangladeshi participants. *mSphere*, 9(3), e00565-23.
7. Kelly, M., Jeon, S., Yun, J., Lee, B., Park, M., Whang, Y., Lee, C., Charles, R.C., Bhuiyan, T.R., Qadri, F., **Kamruzzaman, M.**, ... & Ryan, E. T. (2023). Vaccination of Rabbits with a Cholera Conjugate Vaccine Comprising O-Specific Polysaccharide and a Recombinant Fragment of Tetanus Toxin Heavy Chain Induces Protective Immune Responses against *Vibrio cholerae* O1. *The American Journal of Tropical Medicine and Hygiene*, 109(5), p.1122.
8. Kaiser, M. H., Kelly, M., **Kamruzzaman, M.**, Bhuiyan, T. R., Chowdhury, F., Khan, A. I., ... & Ryan, E. T. (2023). Comparison of O-specific polysaccharide responses in patients following infection with *Vibrio cholerae* O139 versus vaccination with a bivalent (O1/O139) oral killed cholera vaccine in Bangladesh. *mSphere*, 8(5), e00255-23.
9. Kelly, M., Mandlik, A., Charles, R.C., Verma, S., Calderwood, S.B., Leung, D.T., Biswas, R., Islam, K., **Kamruzzaman, M.**, Chowdhury, F. ... & Ryan, E. T. (2023). Development of Shigella conjugate vaccines targeting *Shigella flexneri* 2a and *S. flexneri* 3a using a simple platform-approach conjugation by squaric acid chemistry. *Vaccine*, 41(34), pp.4967-4977.
10. Nizam, N. N., Mahmud, S., Ark, S. A., **Kamruzzaman, M.**, & Hasan, M. K. (2023). Bakuchiol, a natural constituent and its pharmacological benefits. *F1000Research*, 12.
11. Jones, F. K., Bhuiyan, T. R., Muise, R. E., Khan, A. I., Slater, D. M., Hutt Vater, K. R., Chowdhury, F., Kelly, M., Xu, P., Kováč, P., Biswas, R., **Kamruzzaman, M.**, Ryan, E. T., ... & Azman, A. S. (2022). Identifying recent cholera infections using a multiplex bead serological assay. *mBio*, 13(6), e01900-22.
12. Akhtar, M., Basher, S. R., Nizam, N. N., **Kamruzzaman, M.**, Khaton, F., Banna, H. A., ... & Qadri, F. (2022). Longevity of memory B cells and antibodies, as well as the polarization of effector memory helper T cells, are associated with disease severity in patients with COVID-19 in Bangladesh. *Frontiers in Immunology*, 13, 1052374.
13. Rashidijahanabad, Z., Kelly, M., **Kamruzzaman, M.**, Qadri, F., Bhuiyan, T. R., McFall-Boegeman, H., ... & Huang, X. (2022). Virus-like particle display of *Vibrio cholerae* O-specific polysaccharide as a potential vaccine against cholera. *ACS infectious diseases*, 8(3), 574-583.
14. Jeon, S., Kelly, M., Yun, J., Lee, B., Park, M., Whang, Y., Lee, C., Halvorsen, Y.-D., Verma, S., Charles, R. C., Harris, J. B., Calderwood, S. B., Leung, D. T., Bhuiyan, T. R., Qadri, F., **Kamruzzaman, M.**, Cho, S., Vann, W. F., Xu, P., Kováč, P., Ganapathy, R., Lynch, J., & Ryan, E. T. (2021). Scalable production and immunogenicity of a cholera conjugate vaccine. *Vaccine*, 39(47), 6936-6946.
15. Hasan, M. K., **Kamruzzaman, M.**, Manjur, O. H. B., Mahmud, A., Hussain, N., Mondal, M. S. A., ... & Rahman, A. (2021). Structural analogues of existing anti-viral drugs inhibit SARS-CoV-2 RNA dependent RNA polymerase: A computational hierarchical investigation. *Heliyon*, 7(3).
16. Charles, R.C., Kelly, M., Tam, J.M., Akter, A., Hossain, M., Islam, K., Biswas, R., **Kamruzzaman, M.**, Chowdhury, F., Khan, A.I. ... & Ryan, E. T. (2020). Humans surviving cholera develop antibodies against *Vibrio cholerae* O-specific polysaccharide that inhibit pathogen motility. *mBio*, 11(6), pp.10-1128.

17. Iyer, A.S., Jones, F.K., Nodoushani, A., Kelly, M., Becker, M., Slater, D., Mills, R., Teng, E., **Kamruzzaman, M.**, Garcia-Beltran, W.F. ... & Charles, R. C. (2020). Persistence and decay of human antibody responses to the receptor binding domain of SARS-CoV-2 spike protein in COVID-19 patients. *Science immunology*, 5(52), eabe0367.
18. Choudhury, T. Z., **Kamruzzaman, M.**, & Islam, L. N. (2019). Investigation of the cellular and soluble markers of inflammation for the assessment of cardiovascular risk in patients with acute coronary syndrome in Bangladesh. *International Journal of Electronic Healthcare*, 11(1), 67-80.
19. **Kamruzzaman, M.**, Choudhury, T. Z., Rahman, T., & Islam, L. N. (2019). A cross-sectional study on assessment of oxidative stress in coronary heart disease patients in Bangladesh. *World Journal of Cardiovascular Diseases*, 9(05), 331.
20. Hossain, T., **Kamruzzaman, M.**, Choudhury, T. Z., Mahmood, H. N., Nabi, A. N., & Hosen, M. I. (2017). Application of the subtractive genomics and molecular docking analysis for the identification of novel putative drug targets against *Salmonella enterica* subsp. *enterica* serovar Poona. *BioMed research international*, 2017(1), 3783714.

### **Conference proceedings**

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1. **Kamruzzaman M**, Kelly M, Charles RC, Harris JB, Calderwood SB, Akter A, Biswas R, Hasanul MK, Bhuiyan TR, Ruttens B, Saksena R, Kovac P, Xu P, Qadri F, Ryan ET. Defining polysaccharide specific antibody targets against *Vibrio cholerae* O139 in humans following O139-cholera and following vaccination with commercial bivalent oral cholera vaccine, and evaluation of conjugate vaccines targeting O139. **Oral presentation at ASTMH annual meeting, Washington, USA (Nov 17-21, 2021), (Abstract number-1296).**
2. **Kamruzzaman M**, Tanvir Hossain, Kabir T, Fatema N, Munni MA, Akhteruzzaman S, Hosen MI. Subtractive Genomics: A faster and specific approach to rectify the dead ends of drug development. Presented on DNA Day. Organized by Department of Genetic Engineering and Biotechnology, Dhaka University, April 25, 2016.

### **Laboratory skills**

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**Immunology:** Extraction of lipopolysaccharide from *S. flexneri/Vibrio cholerae*, Peripheral Blood Mononuclear Cell (PBMC) separation by density gradient ficoll isopaque, Extraction of Lamina Propria Lymphocytes (LPL) from gut biopsy, Enzyme Linked Immunosorbent Assay (ELISA), Enzyme Linked Immunospot Assay (ELISpot), Complement mediated bactericidal activity (Vibriocidal Assay), Immunoassays from Dried Blood Spot (DBS), Phenotyping and sorting of specific PBMC through Flow Cytometry.

**Molecular Biology:** Polymerase Chain Reaction (PCR), RT-PCR, Gel electrophoresis, Affinity chromatography, Plasmid/DNA extraction and purification, Transformation, Liposome mediated transfection. Generation of SARS-CoV-2 pseudovirus and determine SARS-CoV-2 spike specific neutralizing antibody, Production and purification of SARS-CoV-2 RBD specific antigen. Handling and culture of mammalian Cell Lines (e.g. HEK293T, THP1), Antibody in Lymphocytes Supernatant (ALS) assay, Memory B cell culture, T-cell stimulation assay.

Expertise in handling mouse (Swiss Webster, CD1), vaccination and extracted blood from mouse and neonatal challenge assay to test the vaccine efficacy.

## Fellowship and Honors

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- **U.S. National Institute of Health (NIH) Fogarty International Center (FIC) Training Fellowship on vaccine development and public health, MGH, Harvard Medical School, USA (2019-2020) (D43/TW005572)**
- **National Science and Technology (NST) Fellowship (2016-2017)** from Ministry of Science and Technology, Government of Bangladesh, on MS thesis work.
- **Higher Secondary School Scholarship** (Rajshahi Board, 2010) from Government of Bangladesh.
- **Secondary School Scholarship** (Rajshahi Board, 2008) from Government of Bangladesh.

## Bioinformatics and computational skills

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- Basic Bioinformatics Tools and computational drug design such as subtractive genomics approach, molecular docking simulation and virtual screening of a library of compound to identify a novel drug target against pathogens.
- Able to analyze the study data using various statistical software (**SPSS, GraphPad Prism, Microsoft Excel etc.**) to interpret the results from different point of view.

## Workshop and Training

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- Workshop on *Omics Data Analysis*, organized by Department of Biochemistry and Molecular Biology, Dhaka, Bangladesh.
- Attended RCR eligible lectures/seminars (e.g. misconduct of research integrity, managing problems with co-authors, another perspective on peer-review, industry and collaborative research etc.) organized by Harvard Medical School, USA.
- Successfully completed the course on *ICH-Good Clinical Practice (GCP)* by the Global Health Network.
- Training on *Bio-safety and Bio-security* that includes Safe laboratory design, General laboratory safety, Chemical safety and Waste management at icddr,b.
- Workshop on *Gender and Diversity*, organized by icddr,b.
- Training on *Fire Fighting, Fire Safety & First Aid* at icddr,b.

## References

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### Dr. Firdausi Qadri

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Mucosal Immunology and Vaccinology Unit  
Enteric and Respiratory Infections  
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