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Dr. S.M. Rafiqul Islam

Associate Professor, Department of Biotechnology & Genetic Engineering & Head of Dept.

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Biography

Dr. SM Rafiqul Islam is an Associate Professor and the Head of the **Department of Biotechnology & Genetic Engineering (BGE)** at United International University (UIU) in Dhaka, Bangladesh. A dedicated researcher and educator, having over 16 years of research experience in the field of Cancer, Immunology, Cell-Based Immunotherapy for metastatic Cancers, Personalized Medicine, Stem Cell Biology, Tissue Engineering, Regenerative Medicine, and translational research. Dr. Islam earned his Ph.D. in Pediatric Oncology Medicine from Chiba University School of Medical and Pharmaceutical Science, Japan, where his research focused on *De Novo* evolved genes in metastatic human pediatric cancers such as Neuroblastoma, Glioblastoma, Pineocytoma. He reprogrammed transgene-free reprogramming of human neuroblastoma cells into induced Pluripotent Stem Cells (iPSCs) for modelling disease, dissecting neuroblastoma in a dish and screening small molecule inhibitors (drug) for treatment. He further honed his expertise during his postdoctoral fellowships at the National Institute of Radiological Science (NIRS) in Japan where he examined iPSC-based induction of human mesenchymal stem cells for the application of would healing, radiation injury and neurological disorders. In early 2016, he moved to the United States National Cancer Institute (NCI), National Institute of Health (NIH) Bethesda, Maryland, U.S.A and joined in the Surgery Branch, Center for Cancer Research (CCR) under the Direct Supervision of renowned immunotherapy pioneers Nicholas P. Restifo, MD and Dr. Steven A. Rosenberg, MD, Ph.D. Throughout his postdoctoral career, Dr. Islam has made groundbreaking contributions to enhance cancer immunology and T cell-based immunotherapy for metastatic human cancers. He has developed some innovative T-cell-based therapies, including methods to reprogram tumor antigen specific tumor-infiltrating lymphocytes (TILs) from a bulk population of T cells, identifying tumor-antigen specific T cell receptors (TCRs) targeting individual neoantigens and developed methods to generate less differentiated stem-like antitumor T cells which can efficiently destroy and eliminate cancer cells. His work has led to the filing a couple of international patents and the publication of over ten high-impact peer-reviewed articles, many as the lead author. His research has been pivotal in advancing therapies for metastatic cancers, including melanoma, breast, colon, colorectal, gynecological and gastrointestinal metastatic tumors. As a committed educator, Dr. Islam has taught at prestigious institutions in undergraduate level in Chiba University, Japan; Independent University of Bangladesh (IUB) and graduate level students in Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh. His mentorship has inspired the next generation of students and scientists, with many of his mentees excelling in medical and research careers locally and globally. In addition to his academic and research achievements, Dr. Islam has contributed to several clinical trials, including groundbreaking studies on cancer neoantigens and Cancer Hotspot mutation specific T cell receptors (TCRs) transduced T cell therapy, and the generation of T cells from cancer patientâ€™s induced pluripotent stem cells (iPSCs) carrying specific TCRs for next-generation cell based therapeutic applications. Dr. Islamâ€™s dedication

to science and education reflects his commitment to combating cancer and fostering global collaboration in biotechnology and genetic engineering I coming days.

Education

Postdoctoral Research Fellow (January 2021-February 2024) Surgery Branch, Center for Cancer Research (CCR),National Cancer Institute (NCI), National Institutes of Health (NIH),U.S. Department of Health and Human Service (HHS), Bethesda, Maryland, U.S.A. Principal Investigator: Steven A. Rosenberg, M.D., Ph.D. **Postdoctoral Visiting Fellow (January 2016-December 2020)** Surgery Branch, Center for Cancer Research (CCR), National Cancer Institute (NCI), National Institutes of Health (NIH), U.S. Department of Health and Human Service (HHS), Bethesda, Maryland, U.S.A. **Postdoctoral Fellow (May 2014- December 2015)** National Institute of Radiological Science (NIRS), Chiba, Japan. Project Title: Direct reprogramming of human Mesenchymal Stem cells (MSCs) into neuronal lineages cells for cell-based therapy of neurodegenerative diseases. **Doctor of Philosophy (Ph.D.) in Medicine, March 2014** Department of Molecular Biology & Oncology Graduate School of Medical and Pharmaceutical Science, Chiba University, Japan *Dissertation Title: â€œ* Transgene-free Reprogramming of Human Neuroblastoma Cellsâ€. **Masters of Science (M.S.) in Biochemistry & Molecular Biology, July 2008** Department of Biochemistry & Molecular Biology, School of Life Science University of Dhaka, Bangladesh *Dissertation Title: â€œ* Study of HbA1C & its Correlation with Blood Lipid profile in Diabetic Population of Bangladeshâ€. **Bachelor of Science (B.Sc. honors) in Biochemistry & Molecular Biology, June 2006** Department of Biochemistry & Molecular Biology, School of Life Science University of Dhaka, Bangladesh **Higher Secondary Certificate (H.S.C.) from Science group, June 2001** New Govt. Degree College, Rajshahi

Professional Appointments

Associate Professor & Head (May 2024 to till date) Department of Biotechnology & Genetic Engineering (BGE) United International University (UIU) Madani City, Dhaka-1219. **Part-time Faculty (Summer-2024)** School of Life and Environmental Science (SELS) Independent University Bangladesh (IUB) Course taught: BCB 104 (theory+Lab), BIO-105 (theory+Lab), BIO-102 Lab (theory+Lab). **Guest Faculty (Summer-2024)** Department of Biomedical Engineering (BME) Bangladesh University of Engineering and technology (BUET). Course taught: BME 6205: Artificial Organ and Regenerative Medicine. **Doctoral Student and Research Assistant (December 2009- March 2014).** Chiba Cancer Center Research Institute (CCCRI), Chiba, Japan. **Product Executive (January 2009- September 2009).** Product Management Division (PMD) Eskayef Pharmaceuticals Limited (SK+F), Dhaka, Bangladesh. **Research Assistant** Immunology Laboratory **Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (** BIRDEM) hospital. Shahbagh, Dhaka, Bangladesh. **Small and Medium Enterprises (SME) Foundation** Ministry of Industries (MOE), Government of the Peoples Republic of Bangladesh. 91, Motijheel C/A, Dhaka-1000

Clinical Trials:

Current and Ongoing Clinical Trials in Bangladesh: (1) â€œA Phase I Trial of Ex Vivo Expanded Immune Cell Transfer Therapy in Patients With Refractory or Relapsed Acute Myeloid Leukemia (R/R AML)â€. (2) â€œTreatment of Patients with Relapsed/Refractory (R/R) CD19+ Lymphoid Malignancies Using Chimeric Antigen Receptor (CAR) Engineered T-Cells: A Uncenter Phase I/II Clinical Trialâ€. For details and enrollment please contact: +88-01576-917475.
Earlier Clinical Trial Experiences at the Surgery Branch,
National Cancer Institute (NCI), National Institute of Health (NIH)
Bethesda, Maryland, U.S.A. : ** Key Contributor in Clinical Trials for Metastatic Epithelial Cancer treatment Using Autologous Tumor-Infiltrating Lymphocytes (TIL) and T-Cell Receptor (TCR)-Engineered Peripheral Blood Lymphocytes. Served as a key contributor to a groundbreaking clinical trial team focused on treating metastatic epithelial cancer patients with autologous tumor-infiltrating lymphocytes (TIL) **and** T-cell receptor (TCR)-engineered peripheral blood lymphocytes**. This trial was conducted under the leadership of** Dr. Steven A. Rosenberg, M.D., Ph.D. **, Chief of the Surgery Branch at the** National Cancer Institute (NCI) **,** National Institutes of Health (NIH) **, Bethesda, Maryland, USA. Primary responsibilities was: *** Cultivating T lymphocytes **and generating** dendritic cells **to support the trial. *** Screening and identifying neoantigen hotspots **(mutations) to assess their sensitivity and specificity, while ensuring safety protocols were met. *** Coordinating** with cross-functional teams to execute patient treatment effectively and ensure regulatory compliance.

In addition to these core responsibilities, Dr. Islam played a crucial role in the **successful execution of patient treatments** by collaborating with a multidisciplinary team, including **physicians, surgeons, nurses, sequencing teams, manufacturing teams, quality assurance personnel** , and other supporting staff. My work involved assisting with the **planning, infusion of engineered T cells** , and **monitoring patient outcomes** , all aimed at achieving the trialâ€™s goals and advancing cancer immunotherapy. ***Some of the Prior Clinical Trials Dr. Islam participated are listed below:*** **(1) Trial Number: NCT01174121:**
â€œAnalysis of cancer neoantigen reactivity and T cell phenotypes of infusion products administered as part of

trial NCT01174121, â€œImmunotherapy Using Tumor Infiltrating Lymphocytes for Patients with Metastatic Cancer.â€
Time participated: September 2020 â€“ March 2024. **(2) Trial Number: NCT03412877:**
Research leading to identification of cancer neoantigen-specific TCRs for use in trial NCT03412877, **â€œAdministration of Autologous T-Cells Genetically Engineered to Express T-Cell Receptors Reactive Against Neoantigens in People with Metastatic Cancer.â€**
Time participated: September 2020 â€“ March 2024. **(3) Trial Number: 18-C-0043:**
â€œGeneration of Cancer Antigen-Specific T-Cells from Human Induced Pluripotent Stem Cells (iPSC) for Research and clinical trials using Rejuvenated Stem-like antitumor T cells carrying neoantigen specific T Cell receptors (TCRs)â€.
Time participated: June 2017 â€“ October 2020.

US Patents Inventor

1. Nikolas Zacharakis, ***SM Rafiqul Islam*** , Samantha Seitter, Maria R. Parkhurst, Frank J. Lowery, Steven A. Rosenberg (2024). â€œ ***T Cell Receptors Targeting E545K Or N345K Mutation in PIK3CAâ€***. US Patent Application Number: 63/565,764; HHS Reference: E-076-2024-0-US-01, filed on March 15, 2024. Status- pending.
2. Raul E. Vizcardo, ***SM Rafiqul Islam*** , Naritaka Tamaoki, Takuya Maeda, Nicholas P. Restifo. 2021. ***â€œPreferential Generation of IPSC Carrying Antigen Specific TCRs from Tumor Infiltrating Lymphocytesâ€.*** US Patent Number. US 2023/0265508 Al; HHS Reference: E-109-2020-0-PCT-02, filed August 20, 2021, and issued on August 24, 2023.
3. Meghan L. Good, ***SM Rafiqul Islam ,*** Naritaka Tamaoki, Raul E. Vizcardo, Nicholas P. Restifo. 2021. ***â€œMethods of Producing T Cell Populations Using Induced Pluripotent Stem Cellsâ€.*** US Patent Number: US 2023/0036952 Al; HHS Reference: E-091-2019-0-PCT-02, filed on January 07, 2021, and issued on February 02, 2023.

Book Chapter

1. **Islam *, S.R.*** and Siddiqua, T.J. (2020) â€œFunctional Foods in Cancer Prevention and Therapy: Recent Epidemiological Findings.â€ In Y. Kabir edited â€œFunctional Foods in Cancer Prevention and Therapyâ€ Publisher: Academic Press; Chapter. 20, pages 405-433. https://www.sciencedirect.com/science/article/pii/B978012816151700020X.
2. Good ML., Vizcardo R., ***Islam S.R.*** , Maeda T., Tamaoki N. (Book Chapter contribution in Japanese textbook, 2018). ãƒžã,¦ã,¹è ˜å°Žå¤šèƒ½æ€§å¹¹ç´°èƒžç”±æ¥è…«ç˜æŠ—åŽŸç‰¹ç•°çš„èƒ¸…°ç§»æ°'ã,'ç"Ÿæˆã™ã,‹ä¸‰æ¬¡å…ƒèƒ¸…°åŸ¹é¤Šã,·ã,¹ãƒ†ãƒ .

Journal Reviewer

Frontiers in Oncology

Awards and Fellowship

- Research Fellowship Position, National Cancer Institute (NCI), National Institute of Health (NIH), Bethesda, Maryland, U.S.A. January 2021- February 2024. (3+ years)
- Visiting Fellow Award, National Cancer Institute (NCI), National Institute of Health (NIH), Bethesda, Maryland, U.S.A. January 2016- December 2020. (5 years).
- Global Center for Research in Immune System Regulation and Treatment, Chiba University, Japan, January 2013- December 2013. (1 year).
- Advanced in Neuroblastoma Research (ANR), Travel Grant, Toronto, Canada. May 2012.
- The Fuji Scholarship for International Students, Tokyo, Japan. July 2011-December 2011. (6 months).
- Chiba Cancer Center Research Institute (CCCRI), Doctoral Scholarship for International Students, Chiba, Japan. December 2009- March 2014. (4+ years).

Professional Affiliation

- The Society for Immunotherapy of Cancer (SITC), U.S.A
- International Society of Stem cell research (ISSCR), U.S.A.
- American Association of Cancer Research (AACR), U.S.A.
- Japanese Cancer Association (JCA), Japan
- Graduate Biochemist Association (GBA), Bangladesh
- Bangladesh Society for Biochemistry and Molecular Biology (BSBMB)

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