

Mirza S Baig

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Prof. Baig obtained his Ph.D. in Biochemistry from the Central Drug Research Institute (CDRI), Lucknow, India, in 2008. His strength, dedication, and motivation to pursue academic goals are impressive. He has published extensively in peer-reviewed international journals such as the Journal of Experimental Medicine, the Journal of Allergy and Clinical Immunology, and Frontiers in Immunology. Dr. Baig is the recipient of numerous national and international awards, including the Ramanujan Award (2015), the Ramalingaswami Award (2015), the Lady Davis International Professorship (2020), the ASM-IUSSTF Indo-US Professorship (2020), the TUM Visiting Professorship (2019), the Cambridge University Visiting Professorship (2019), and the IUBMB Visiting Professorship at the University of Illinois at Chicago (2021), among many others. He currently serves as an editor and associate editor for several immunology journals, including Frontiers in Immunology and scientific reports. Dr. Baig has also been honored as a fellow of various national and international scientific societies, including the Royal Society of Biology, UK.

Prof. Baig is well-known for his interdisciplinary research focused on cell signaling networks in macrophages during various pathophysiological conditions that lead to chronic inflammatory diseases. He studies both the basic biology of inflammation and the regulatory mechanisms that control the initiation, quality, and intensity of inflammatory responses. His interest at the cellular and molecular levels lies in understanding how the inflammatory response is triggered and executed.

Prof. Baig breakthrough discovery demonstrating the role of Neuronal Nitric Oxide Synthase (NOS1)-derived Nitric Oxide (NO) in activating the inflammatory response during chronic inflammatory diseases (J Exp Med; 2016) marked a turning point in NOS1 signaling. This discovery has led investigators worldwide to explore macrophage NOS1-derived NO in the context of various chronic inflammatory conditions. His recent work on Toll-interleukin-1 Receptor (TIR) domain-containing adaptor protein (TIRAP) emphasizes its central role in

various inflammatory responses (Frontiers Immunology; 2021). The specific interactions of TIRAP with its binding partners define the type of inflammatory response, and the dynamic nature of these interactions demonstrates the severity of the inflammation. Understanding TIRAP interactions is critical for addressing different chronic inflammatory conditions and developing therapeutic strategies to mitigate acute and chronic inflammatory diseases.

Prof. Baig discovery of repurposing thioridazine (TDZ), a potent antipsychotic drug, as an anti-inflammatory agent has opened new avenues for studying potential repurposed drugs against inflammation (Sci. Rep., 2018). Another significant finding includes gefitinib's ability to disrupt the interaction between TIRAP and c-Jun, thereby inhibiting a major inflammatory response observed in patients experiencing sepsis, serving as a therapeutic strategy for AP1-mediated inflammatory responses (Int. Immunopharmacology, 2019). Additionally, his lab discovered dorzolamide (DZD) as a suppressor of the PKC δ -TIRAP-p38 MAPK signaling axis, dampening the inflammatory response (Future Med Chem., 2023). One of his recent breakthroughs involves a combination therapy for which a patent has been submitted. This combination therapy includes the broad-spectrum antibiotic levofloxacin and the repurposed anti-inflammatory drug dorzolamide, addressing two distinct features of sepsis progression: killing bacteria and healing injured organs while preserving homeostasis. Furthermore, this composition exhibits anti-inflammatory effects, resulting in a synergistic combination that targets pathogens and dysregulated immune responses. He has received received best technology development award 2024 by IIT Indore on the discovery.

Prof. Baig research has uncovered novel mechanisms for activating the immune response and revealed the dynamic behavior of inflammatory molecules during the progression of inflammatory responses. His findings have introduced groundbreaking concepts in understanding the host's response to infections and have contributed to the search for innovative therapeutic targets in sepsis. Based at India's prestigious Indian Institute of Technology (IIT) Indore, he has established robust training programs for students and young faculty in clinical translational medicine, aiming to cultivate a cadre of clinical researchers focused on studying sepsis and cancer issues in India. He is a globally recognized scientist in his own right and has significantly contributed to the growth and stature of IIT Indore and the Indian S&T ecosystem.