डी एन ए फ़िंगरप्रिंटिंग एवं निदान केन्द्र
(जैव प्रौद्योगिकी विभाग, विज्ञान एवं प्रौद्योगिकी मंत्रालय, भारत सरकार का स्वायत्त संस्थान)
Centre for DNA Fingerprinting and Diagnostics
(An autonomous institute of the Dept. of Biotechnology, Ministry of Science & Technology, Govt. of India)

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Citation on the outstanding research work done by Dr. Sangita Mukhopadhyay

Dr. Sangita Mukhopadhyay has made outstanding scientific contributions in tuberculosis, designing of immunomodulators and its implication in human health. She has established collaboration with several hospitals / Medical Institutes and made excellent contributions in the field of Tuberculosis and Inflammation.

Dr Mukhopadhyay is one of the most successful and creative scientists in the immunology and infection biology (Tuberculosis [TB]) research field. Her excellent training and strong background combined with her dedicated ambitions and expertise makes her a tremendous asset for the scientific community. Dr Mukhopadhyay's research has led to several high-end publications and International patent. A smart pathogen like *Mycobacterium tuberculosis* lacks typical toxins but uses multiple spatio-temporally regulated virulent factors to subvert protective responses of the host to favor its survival. Since the discovery of INH in the 1940s, no effective antimycobacterial drugs has been commercially available making the tuberculosis a huge public burden especially with the emergence of MDR/XDR strains. To desist convergent adaptive evolution of the pathogen, host-directed therapy appears to be a futuristic and an attractive alternative to drug-based therapeutic strategy to control tuberculosis. As a first step towards this direction, an understanding of the host-pathogen interaction is imperative. Dr Mukhopadhyay's work contributed to the knowledge on how the innate and adaptive (Th1/Th2) immune response of host are hijacked by some mycobacterial proteins like ESAT-6, PknG and some members of the intriguing PE/PPE family proteins (PE11, PPE2 and PPE18) which could be potential drug targets. (***Journal of Biological Chemistry, 2012, 2013; Journal of Immunology, 2009, 2011, 2016, 2018, 2019, 2020; PLoS Pathogens 2014; Scientific Reports, 2016***). She identified two FDA approved drugs (Mirabegron and Olsalazine) that target ESAT-6:β2M interaction and showed promising therapeutic results (***Journal of Immunology, 2019, 2020***). Also she highlighted PPE18-TLR2 11~15 LRR domain could be potential drug target to boost CD4 Th1-based protective immune responses of host. Again for the first time she showed an important role of PPE2 protein to inhibit host's innate defense response and myeloid haematopoiesis (***J. Immunol.[2019]203:1218; Immunobiology[2020] 226:152051***). She importantly contributed to understand immunosuppression caused by excess production of free radicals and therapeutic effect of anti-oxidant to boost the immune response against tuberculosis (***Blood, 2006; Journal of Immunology, 2010***). Thus, her research ushers promising approaches for host directed immune therapy targeting ESAT-6, PPE2 and PPE18 protein of *Mycobacterium tuberculosis* and application of anti-oxidant (N-acetyl cysteine) to increase host protective responses against TB. The study will make a long term contribution in preventing infection and disease in countries with high burdens of TB. In the field of 'Disease Biology', she has been bestowed with many highly prestigious 'National Awards'.

Considering her immense contributions in the field of Biomedical Research, I am pleased to nominate **Dr. Sangita Mukhopadhyay** for the **Sun Pharma Science Foundation Research Awards, 2021 under Medical Sciences (Basic Research).**

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