**Dr. C. M. Gupta**, FNA, FaSc, FNASc, FAMS, FTWAS
**DBT Distinguished Research Professor**
and
Former Director, CSIR-IMTECH, Chd; CSIR-CDRI, Lko

## Citation

Dr. Mohammad Owais has made significant contributions to the area of design and development of novel delivery systems for drugs and vaccines specifically for treatment of infectious diseases and cancer. Also, he has developed nano-particles based DNA and subunit vaccines for specific targeting to dendritic cells. Besides, he has shown that pre-exposure of PBMCs with HIV-1 makes the cells resistant to subsequent challenge with HIV-2.

(Dr. CM Gupta)

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It is my pleasure to nominate **Dr. M. Owais** for the "**Sun Pharma Research Foundation Award 2023**" in pharmaceutical sciences. Dr. Owais has significantly contributed to the targeted drug delivery and nano vaccines against some important infectious diseases. He has recently developed an effective drug formulation for the treatment of COVID-19 disease. The program was sponsored by the Ministry of AYUSH. The as-developed formulation was found to be successful in the treatment of moderate COVID-19 infection in the clinical setup. The proposed research work has not been considered for an award from any other agency.

In spite of their widely acclaimed potential for sustained drug release and potential to accumulate at the desired site, Nanoparticles do come across with series of barriers that prevent the achievement of desirable therapeutic outcomes. The main emphasis of Dr. Owais has therefore been on addressing some of such problems. He has developed siRNA/CRISPR/Cas 9 bearing nanoparticles for the treatment of skin, liver, breast, and lung cancer in model animals. He demonstrated that liposomes prepared with lipids (from *E. coli* or Archaebacteria) can specifically prime dendritic cells to activate both $CD4^+$ T helper as well as $CD8^+$ T cytotoxic cells of the host. He has also demonstrated that exosomes, as well as in-side-out erythrocyte vesicles, can deliver encapsulated antigens to the cytoplasm of the target cells and find application in the development of a prophylactic vaccine against murine malaria. Recently, he demonstrated that **nano-particle/amyloid** mediated targeting of RD9 gene products of *Mycobacterium sps* to dendritic cells favors the Th1 phenotype of elicited $CD4^+$ T lymphocytes against tuberculosis, thereby helping to cut down the antigen dose by several folds. Besides, he developed nanoparticles-based DNA (SOD/IL-18) and $L_7/L_{12}$ ribosomal protein-bearing vaccines against experimental brucellosis and escheriosome-based subunit vaccines against experimental malaria and leishmaniasis in BALB/c mice.

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