Annexure III: Citation (summary) on the outstanding research work on which award is claimed in about 250 words **signed** by the nominator.

A central question in *Mycobacterium tuberculosis* (*Mtb*) research is to identify mechanisms of persistence and drug resistance. To fulfil this knowledge gap, Amit's group developed the non-invasive biosensor to measure redox physiology of *Mtb* inside macrophages and in animal tissues during infection in real-time. Combining this approach with a range of cutting edge technologies such as FACS-coupled RNA-seq and Seahorse bioenergetics profiling, Amit discovered host and bacterial mechanisms mediating drug tolerance in *Mtb*. This led to the discovery of a drug (chloroquine) that could be repurposed to accelerate tuberculosis treatment and was published in ***Science Translational Medicine***. In yet, another unique and skilled academic effort Amit's work led to an understanding of the intricate connection between genetic mutations conferring drug resistance and their long-range physiological impact. Using a battery of techniques including computing, genetic assays and molecular and imaging tools, Amit modeled the complex physiological pathway along which a drug-resistant pathogen evolves when exposed to chemotherapy. The thrilling revelation of computational predictions being faithfully enacted by the bacterium understandably led to several high impact publications in ***Science Advances***, ***eLife,*** and ***PLoS Pathogens*.**

Amit's outstanding scientific achievements have also encompassed the understanding of HIV, the causative viral agent of human acquired immunodeficiency syndrome (AIDS). Amit spearheaded a research program to understand the role of redox and energy metabolism in catalyzing HIV-*Mtb* synergy. In doing so, his team identified an empirical role of exosomes secreted by *M. tuberculosis* infected cells in reactivating HIV-1. HIV findings were published in ***mBio, eLife, and EMBO Mol Med***. Amit successfully secured a patent on counteracting HIV by donors of hydrogen sulfide.

Umesh Varshney