Azadi Ka Amrit Mahotsav

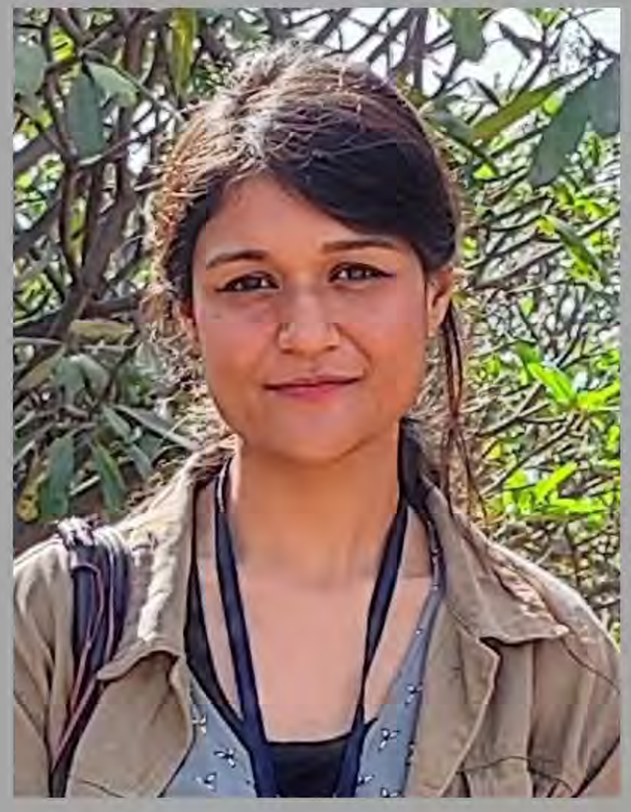
सत्यमेव जयते

राष्ट्रीय प्रतिरक्षाविज्ञान संस्थान

National Institute of Immunology

GRADUATE STUDENT SEMINAR

EXPLORING THE NIRAN DOMAIN OF THE RNA-DEPENDENT RNA POLYMERASE AS A NOVEL THERAPEUTIC TARGET AGAINST SARS-COV-2 AND ITS VARIANTS



DEEPSIKHA KAR

STRUCTURAL AND FUNCTIONAL BIOLOGY LAB

In addition to the canonical fingers, palm, and thumb domains, the RNA-dependent RNA polymerases (RdRp) from the viral order *Nidovirales* possess two additional domains. Of these, the function of the Nidovirus RdRp-associated nucleotidyl transferase domain (NiRAN) is yet to be deciphered fully. The elucidation of the 3D structure of RdRp from the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), provided the first-ever insights into the domain organization and possible functional characteristics of the NiRAN domain. Using *in silico* tools, we predict that the NiRAN domain assumes a kinase or phosphotransferase-like fold and binds nucleoside triphosphates at its proposed active site pocket. Further, using molecular docking we have predicted the binding of three widely used kinase inhibitors and five well-characterized anti-microbial compounds at the NiRAN domain active site along with their drug-likeliness as well as DFT properties. For the first time ever, using basic biochemical tools, we have shown the presence of a kinase-like activity exhibited by the SARS-CoV-2 RdRp. Notably, a well-known kinase inhibitor- Sorafenib significantly dampens the NiRAN function and reduces viral load in SARS-CoV-2 infected cells. Our study provides a new antidrug target and potential lead compounds for drug repurposing against COVID-19.

15 JUNE 2023, 4.00 PM

GP TALWAR AUDITORIUM, NII

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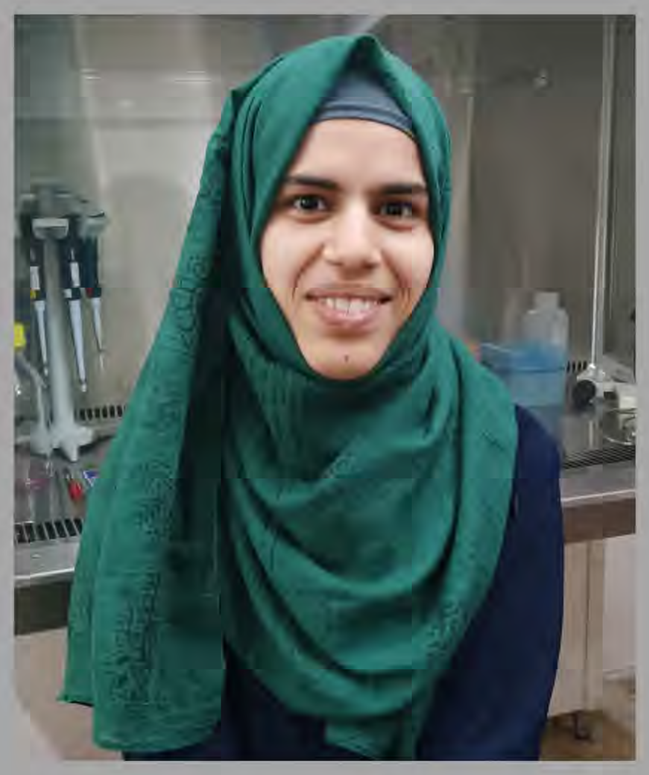
National Institute of Immunology

GRADUATE STUDENT SEMINAR

CYSTEINE/CYSTINE TRANSPORTER IS REQUIRED FOR PNEUMOCOCCAL FITNESS AND VIRULENCE



SHABNAM

MOLECULAR IMMUNOLOGY LAB

The need for the acquisition of essential nutrients by a bacterial pathogen from the host can have a profound impact on the fitness and physiology of the pathogen and the outcome of the infection. It is reported that the bacterial pathogen *Streptococcus pneumoniae* is auxotrophic for six amino acids. *S. pneumoniae* acquires these amino acids via surface transporters. These transporters can be explored as potential therapeutic targets. Small molecules can be screened as blockers or decoys to target these transporters. Moreover, their surface expression and accessibility can be exploited for developing a vaccine candidate. We have identified a solute-binding protein of an ABC transporter that preferably binds cysteine and cystine. We have employed both *in vitro* and *in vivo* assays, to elucidate the role of this protein in pneumococcal fitness and virulence.

15 JUNE 2023, 4.30 PM

GP TALWAR AUDITORIUM, NII