Azadi Ka Amrit Mahotsav

सत्यमेव जयते

राष्ट्रीय प्रतिरक्षाविज्ञान संस्थान

National Institute of Immunology

Website Link : https://nii.res.in/

GRADUATE STUDENT SEMINAR

MULTI-OMICS APPROACHES TO UNDERSTAND THE BIOLOGY OF HUMAN $CD4^+$ CYTOTOXIC T LYMPHOCYTES

RAUNAK KAR

IMMUNOGENOMICS LABORATORY

CD4+ T cells conventionally known for their helper function (Th), have been reported to function as cytotoxic T cells (CD4-CTLs) in several infectious and autoimmune diseases as well as various types of cancers and are correlates of protective immune response. However, compared to other Th subsets, the molecular and epigenetic landscapes that drive the differentiation, maintenance, and function of human CD4-CTLs remain elusive. Hence, we characterized these CD4-CTLs in comparison to other well-defined CD4 T-cell subsets in humans by identifying their unique gene expression profile, epigenetic landscape, and TCR repertoire using multi-omics approaches at both bulk and single-cell resolution.

1 JUNE 2023, 4.00 PM

GP TALWAR AUDITORIUM, NII

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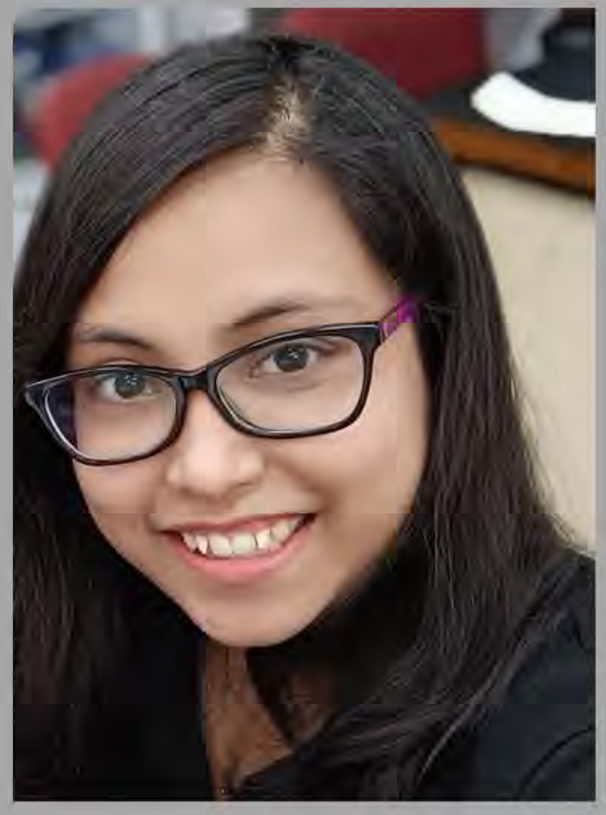
GRADUATE STUDENT SEMINAR

NANO-SCALE ARTIFICIAL ANTIGEN-PRESENTING CELLS FOR ANTI-TUMOR ADOPTIVE T CELL THERAPY



ANTARA MONDAL

NANO-BIOTECHNOLOGY LABORATORY

Ex-vivo expansion of polyclonal T cells and subsequent reinfusion into patients shows promising clinical results. In this study, we have developed iron-oxide nanoparticle-based artificial antigen-presenting cells (artificial-APCs) that could expand antigen-specific T-cells suitable for adoptive T-cell therapy against tumors. Our preliminary data indicate that the valency of peptide-major histocompatibility complex (p-MHC) and co-stimulatory molecules on the nanoparticles govern the expansion of T cells by promoting p-MHC-TCR (T cell receptor) cluster formation. We found that the artificial APCs of higher valency of p-MHC could expand antigen-specific T cells to a greater extent as compared to the lower p-MHC valency or the commercial beads that could activate T cells by targeting CD3. Furthermore, CD8+ T cells, expanded by the high-valency artificial APCs, could inhibit tumor growth significantly compared to artificial APCs of low valency in mice. The data emphasize the density or valency of p-MHC and co-stimulatory molecules are the critical engineering parameters for formulating artificial APC to expand antigen-specific T-cells suitable for achieving better therapeutic efficacy.

1 JUNE 2023, 4.30 PM

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