

PHD Project Proposal Presentation

Title: - Development and validation of Trop2 Targeting Cellular Immunotherapy for breast cancer through Dendritic Cell Priming

Student's Name: Ms. Gopika Nambiar

Guide's Name: Dr. Bhakti Pathak

Dept: Cellular and Structural Biology

Date and time: 18th May 2026 at 3 pm

Venue: Dr Shanta Rao Auditorium

ABSTRACT:

Trophoblast cell surface antigen 2 (Trop2), a transmembrane glycoprotein, encoded by TACSTD2 gene has emerged as a therapeutic target for solid tumors especially breast cancer. While Trop2 is expressed at low levels in normal epithelial cells, markedly elevated levels are reported across multiple tumor types. Trop2 is reported to be overexpressed in more than 85% of Triple Negative Breast Cancer (TNBC) cases, which is regarded as the most aggressive subtype of breast cancer and associated with limited treatment options and poor prognosis. Overexpressed Trop2 is reported to drive specific signalling pathways including PI3K/AKT, MAPK and β -catenin pathways, promoting the aggressive and therapy resistant phenotype of the tumor.

Antibody Drug Conjugates targeting Trop2 have been approved by FDA for patients with metastatic therapy resistant breast cancer which proves the potential of Trop2 as a therapeutic target. Despite the clinical success, ADCs are not without limitations. Adverse side effects pose significant tolerability challenges and resistance to the ADC drugs remains an unresolvable obstacle. Beyond ADCs, other passive immunotherapy approaches targeting Trop2 like bispecific antibodies and Trop2 targeted CAR-T platforms are being pursued. Poor tumor penetration and toxicity remain some of the major disadvantages associated with these approaches in preclinical studies highlighting the need for developing active immunotherapeutic approaches. The current study aims at demonstrating the ability of Trop2 pulsed dendritic cells (DCs) to generate Trop2 specific immune response and to evaluate the safety and efficacy of this targeted immunotherapy using syngenic mouse model as well as donor PBMCs. Study objectives and detailed methodology will be discussed during the proposal presentation.