Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy Dist., Hyderabad – 500 046

Seminar

Structure-Guided Engineering of CAR-scFvs for Next-Generation CAR-T Cell Therapy

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CAR-T therapy has transformed the treatment of haematological malignancies. In India, CD19-targeted NexCAR19 has received CDSCO approval for treating B-cell cancers, including leukaemia. Building on this progress, our lab focuses on the structure-guided optimisation of CAR-scFvs using molecular modelling, microsecond molecular dynamics simulations, free-energy landscape analysis, and binding free-energy calculations. We investigate how linker architecture and framework engineering influence scFv stability and antigen recognition. Our findings highlight the role of linkers in conformational flexibility and domain orientation, while rational framework modifications can improve structural stability and binding affinity. This work supports the computational design of next-generation CAR-T cells targeting B-cell malignancies.

Tuesday, Nov 17th 2026

16:00 Hrs (Tea / Coffee 15:45 Hrs)

Auditorium, TIFRH