

MONDAY

# COLLOQUIUM

---

## Engineering Biomolecules to Outsmart Malaria

Kalyaneswar Mandal (TIFR, Hyderabad)

15 Sep 2025 (Monday) | 16:00 Hrs (Tea / Coffee 15:45 Hrs) | Venue: TIFRH Auditorium

Malaria parasites claim over half a million lives annually. A critical step in their invasion of human red blood cells is the interaction between two parasite proteins, AMA1 and RON2, which drives moving junction formation. Disrupting this interaction offers a powerful strategy to block invasion. In this talk, I will present how we are engineering biomolecules to outsmart malaria by combining chemical peptide and protein engineering with mirror-image biological display. Using these approaches, we design peptides that inhibit AMA1–RON2 binding and identify mirror-image protein (D-protein) inhibitors that resist proteolysis and show reduced immunogenicity. Such engineered D-proteins hold strong promise as next-generation antimalarial therapeutics.