



Module PMRF- PMRF-ISSS071/II/2025

Principles of Virus–Host Dynamics

Name of the PMRF student

ADITI KANOJIA

Required background of the students taught

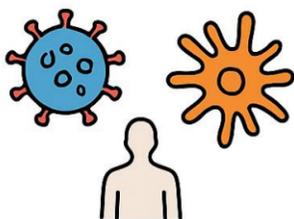
A basic understanding of Cell Biology and Biochemistry is appreciated.

Online Session Coordinator

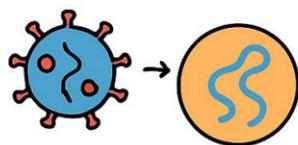
Will be chosen from the list of registrants

VIRUS–HOST INTERACTIONS

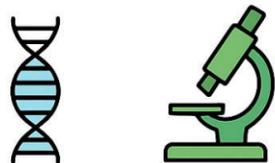
FUNDAMENTALS OF
VIROLOGY AND HOST
IMMUNITY



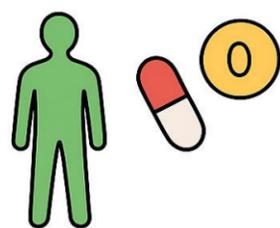
MOLECULAR
MECHANISMS OF
VIRUS–HOST INTERACTIONS



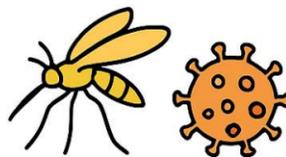
TECHNOLOGIES FOR
STUDYING VIRUS–HOST
INTERACTIONS



HOST FACTORS AS
ANTIVIRAL TARGETS



CASE STUDIES ON
FLAVIVIRUSES AND
MOSQUITO VECTORS



EMERGING TOPICS



Details of the content of the module

Course Structure

- 1. Fundamentals of Virology and Host Immunity (8 hrs)**
Covers virus structure, life cycle, and host cell biology, innate and adaptive immune responses, including interferons, T and B cells, and immune regulation during infection.
- 2. Molecular Mechanisms of Virus–Host Interactions (12 hrs)**
Focuses on viral entry receptors, genome replication, host translation control, viral manipulation of host signaling, apoptosis, metabolism, immune evasion, host restriction factors, and membrane remodelling.
- 3. Technologies for Studying Virus–Host Interactions (8 hrs)**
Introduces genomics, transcriptomics, proteomics, CRISPR screens, imaging (e.g., cryo-EM), and bioinformatics. Covers single-cell and spatial omics, multi-omics integration, with flavivirus research as a case study.
- 4. Host Factors as Antiviral Targets (12 hrs)**
Examines host dependency factors, antiviral drug repurposing, broad-spectrum strategies, host-directed therapies, vaccine design, vector control, and ethical considerations
- 5. Case Studies on Flaviviruses and Mosquito Vectors (6 hrs)**
Reviews flavivirus biology, virus–host interactions in humans and mosquitoes, CRISPR screening in *Aedes*, and viral persistence via vertical transmission.
- 6. Emerging Topics (4 hrs)**
Discusses virus–host co-evolution, zoonotic spillover, chronic infections, and microbiome influences.
- 7. Discussions (2 hrs)**
Interactive review sessions and hot topics.

Schedule of the module

Start Date: 23rd August 2025

End Date: 23rd April 2026

Total number of sessions: 52 (Including the Discussion sessions)

Duration: 1 Hour

Classes will be held on **Thursdays and Fridays**, from **7 to 8 pm**.

Meeting link : Will be shared later

Contact email ID: issf.forum@gmail.com

Registration link:

https://docs.google.com/forms/d/e/1FAIpQLSeBiS5EoAd_4cfTxJP3kSmbCFInv8xSVPXVMQpHmQ7yYRRL4w/viewform?usp=sharing&ouid=101424842980762751595