



**Information and Networking Event  
Horizon Europe 2023 Calls  
Co-Funded by the Government of India  
(DBT)**



**HORIZON-HLTH-2024-DISEASE-08-20: Pandemic preparedness and  
response: Host-pathogen interactions of infectious diseases with  
epidemic potential**

Friday, 13 October 2023

- Title: High-throughput multiplexed antibody immuno-profiling technologies
- Name of presenter: Rahul Roy
- Name of Organisation: Indian Institute of Science, Bangalore
- Country: INDIA
- Your contact details: rahulroy@iisc.ac.in, rahulfx16@nanobiophotonics.org
- Your web url: nanobiology.nanobiophotonics.org

# Understanding host-pathogen profile underlying disease burden

## **Challenge:**

- Infectious diseases remain one of the largest contributors to overall disease burden.
- Many infectious agents while known remain poorly diagnosed
- Prevalence of many pathogen associated diseases is not known.
- Population immunity levels across most pathogens are unknown.
- Technical and economic challenges in deep-immune profiling of individuals

## **Promise:**

- With the advent of RNA/DNA vaccines, rapid development and testing of many vaccines might be possible.
- Identification of pathogen prevalence can help in shaping health policy.

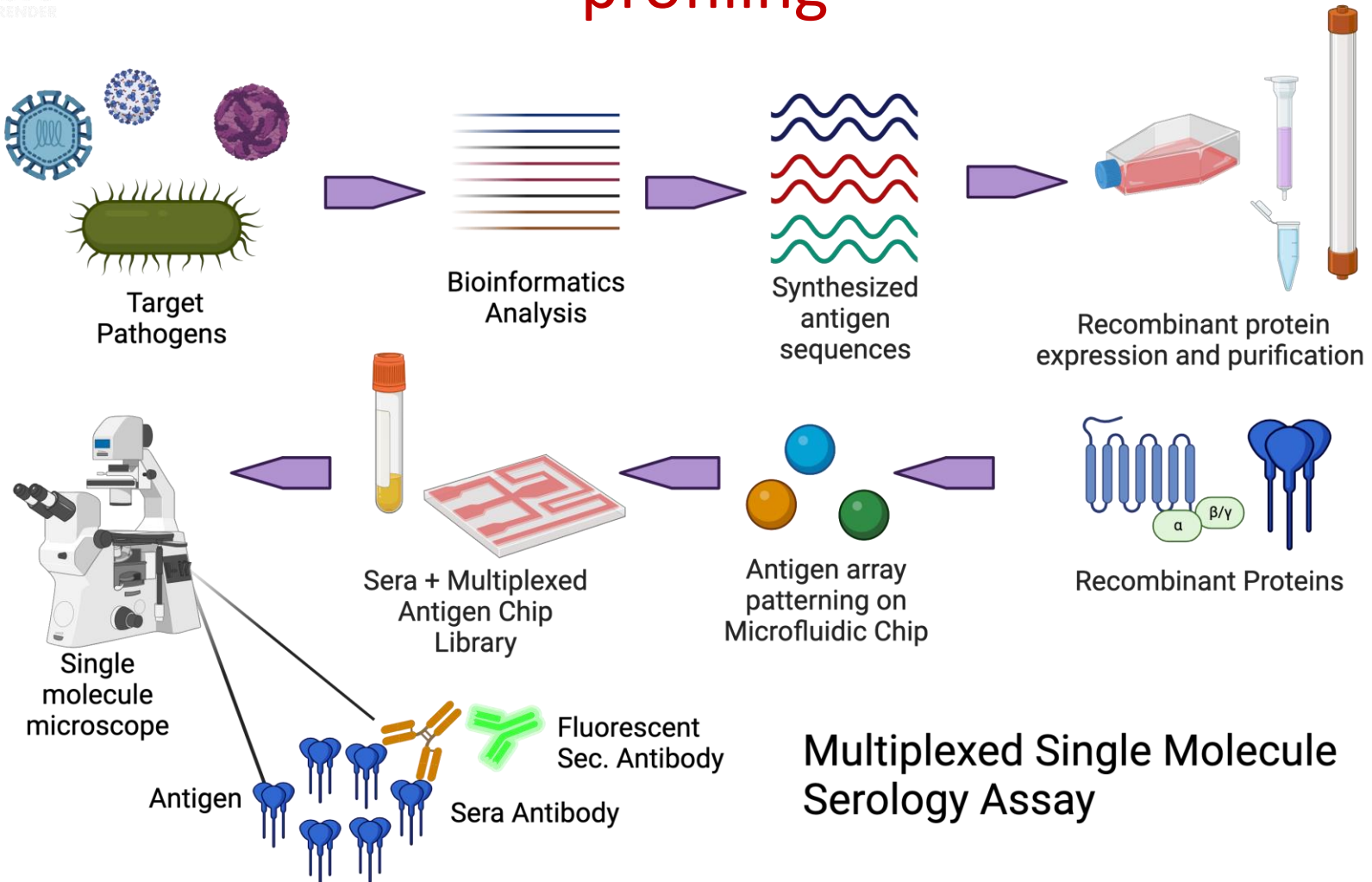
# Development of high-throughput multiplexed antibody immuno-profiling technologies

## **Avenues for collaboration:**

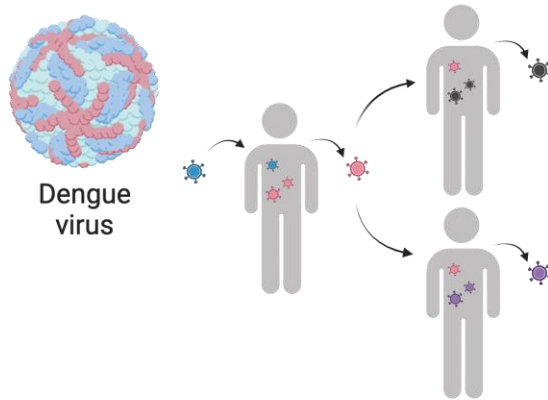
1. To develop and administer a high-throughput multiplexed antibody profiling technologies that detects serum antibodies against several (>25) human pathogens with single molecule sensitivity.
2. To profile immune escape evolution of RNA (Dengue) virus variants using integrative host-virus co-evolution study.

# High-throughput multiplexed antibody immunoprofiling

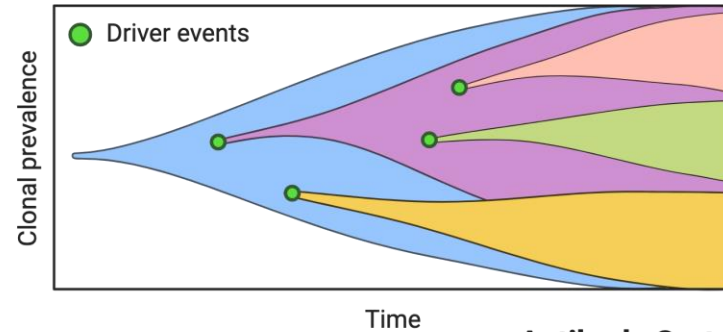
bio  
RENDER



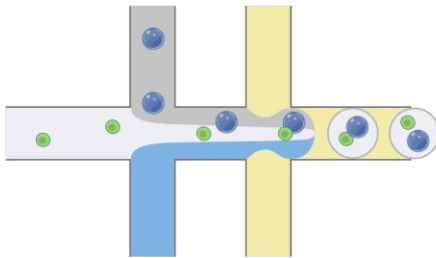
# Immune escape evolution of Dengue virus



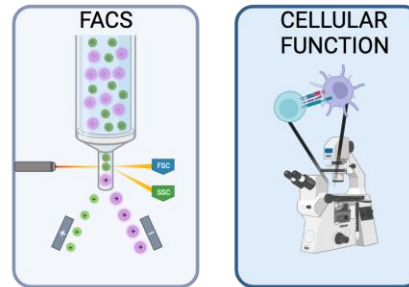
Virus evolution under immune selection pressure



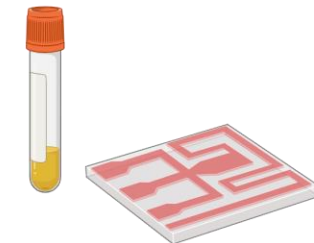
Single cell sequencing to identify virus variants



Virus Profiling

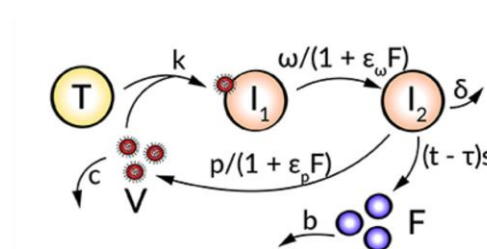
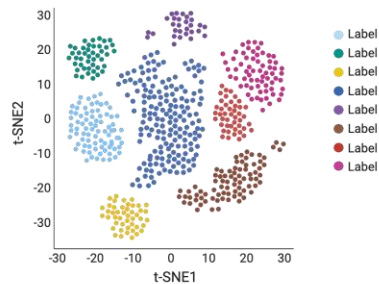


Antibody Cartography and Immune Profiling



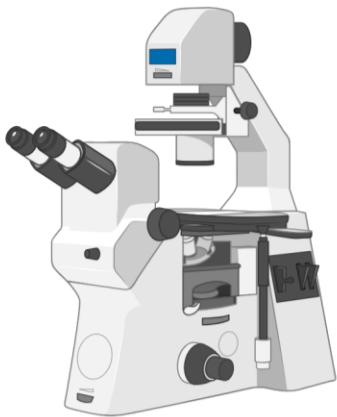
Sera + Multiplexed Antigen Chip Library

Integrative statistical analysis and mathematical modeling



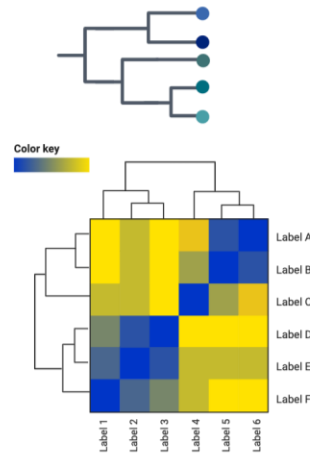
# Methods and Expertise

Single molecule imaging



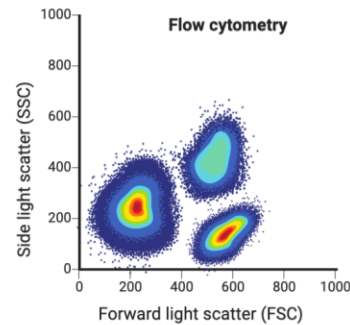
Roy et al. 2008  
S Maurya et al. 2021  
P Sathyanarayana et al. 2018

Virus Genomics



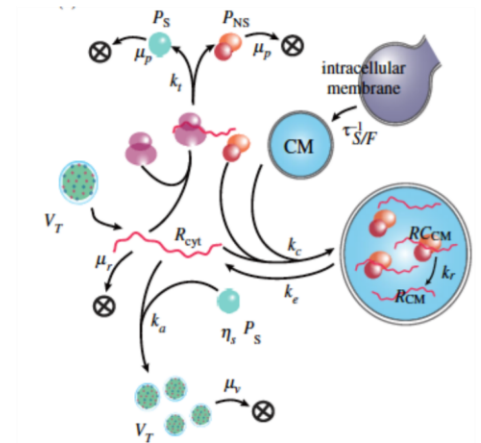
S Jagtap, et al. 2023  
Sankaradoss et al. 2022

Immunoprofiling



S Jagtap, et al. 2021

Mathematical Modeling



H Chhajer, et al. 2021  
Baral et al. 2018