Reverse Vaccinology & Antigen Prioritization — Hands-on

Learn how to go from pathogen genome or proteome data to a rational, ranked list of vaccine antigen candidates. This module integrates epitope predictions, subcellular localization, conservation, safety and manufacturability filters into coherent reverse vaccinology and antigen prioritization workflows.

Reverse Vaccinology & Antigen Prioritization

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Session Index

Session 1

Fee: Rs 8800 Apply Now

Reverse Vaccinology Concepts & Inputs

Forward versus reverse vaccinology paradigms

classical antigen discovery **genome and proteome driven design** **role of omics and in silico filters**

Pathogen data inputs and preprocessing needs

reference genomes and proteomes **strain panels and pan proteomes** **annotation and quality checks**

Defining target product profile and design constraints

target population and indication | preferred immune mechanisms | platform and formulation considerations

Session 2

Fee: Rs 11800 Apply Now

In Silico Antigen Mining & Filtering

Subcellular localization and secretome based filters (conceptual)

outer membrane and surface exposed proteins | secreted antigens and virulence factors | multi pass versus single pass proteins

Epitope density, HLA coverage and promiscuity as features

CD8 and CD4 epitope richness | B cell epitope hot spots | allele and supertype coverage

Conservation and variability across strains or clades

core versus accessory proteins | sequence identity and entropy | escape prone regions

Session 3

Fee: Rs 14800 Apply Now

Ranking, Safety & Manufacturability Screens

Safety related filters and exclusion criteria (conceptual)

homology to human proteins | autoimmunity and cross reactivity risk | toxins and essential housekeeping proteins

Basic manufacturability and expression heuristics

length and domain architecture | low complexity and repeats | aggregation prone regions (orientation)

Scoring and ranking schemes for candidate antigens

multi criteria ranking | weighting epitope, coverage

and safety shortlisting with transparent rationale

Session 4

Fee: Rs 18800 Apply Now

End to End Antigen Shortlist (Mini Project)

From proteome to candidate antigen panel (conceptual workflow)

define objectives and constraints apply localization and epitope filters integrate conservation and coverage

Prioritization table, visual summaries and decision narrative

ranked candidate table with key features figures for coverage and epitope density clear go or hold decisions

Handoff to multi epitope design, formulation and in vitro validation

selecting subset for construct design linking to adjuvant and delivery choices designing experimental validation plan