

HLA Typing & Immunogenetics Informatics — Hands-on

Build validated HLA typing pipelines for clinical and translational applications. This hands-on module covers IPD-IMGT/HLA resources, NGS data processing for Class I/II loci, phasing and ambiguity resolution, G and P group handling, KIR typing overview, quality metrics, and transplant/research reporting with audit-ready documentation.

HLA Typing & Immunogenetics Informatics

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Foundations: HLA System & Databases

HLA & immunogenetics essentials

[Class I \(A, B, C\)](#) [Class II \(DRB1/3/4/5, DQA1/DQB1, DPA1/DPB1\)](#) [peptide presentation overview](#)

Nomenclature & references

[IPD-IMGT/HLA](#) [allele fields \(2/3/4-digit\)](#) [G/P groups](#)

Assays & study design

[amplicon vs capture](#) [read length/coverage](#) [long-read](#)

notes

Session 2

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NGS Typing Pipelines & Phasing

Tools & workflows (short/long reads)

OptiType / Polysolver / xHLA **arcasHLA / HISAT-genotype** **minimap2 + HLA*LA (overview)**

Phasing & ambiguity sources

exon/intron coverage **read length & mapping**
database version drift

QC & performance metrics

depth/uniformity/allele balance **call confidence & flags** **replicates/controls**

Session 3

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Ambiguities, G/P Groups & KIR Overview

Ambiguity resolution strategies

phase-aware refinement **consensus across tools**
orthogonal assays (high-level)

Groups, supertypes & epitopes (Bw4/6)

G/P groups **C1/C2 epitopes** **DPB1 TCE (overview)**

KIR typing & compatibility (overview)

KIR genes/ligands **AA/Bx content** **NK education context**

Session 4

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Validation, Reporting & EHR Integration

Analytical validation & QC

accuracy/precision **reportable range** **proficiency testing**

Transplant/matching & reports

typing resolution & match grades **antibody/epitope context** **limitations & SOPs**

EHR/FHIR integration & governance

FHIR Genomics profiles **CDS hooks (high-level)** **audit trails & versioning**