FARABI MEDICAL LABORATORY

IMMUNOCOMPATIBILITY TEST

Advanced Immunogenetic Evaluation in Reproductive Medicine

NGS-based genotyping of KIR, HLA-C, RhD & ABO

Why Immunocompatibility Matters in Reproduction

Successful implantation and placentation require finely balanced maternal–fetal immune tolerance. Beyond hormonal and anatomical factors, immunogenetic interactions between maternal immune cells and fetal trophoblast play a critical role in early pregnancy development.

Key gene systems involved:

- KIR (Killer Immunoglobulin-like Receptors) on maternal uterine NK cells
- HLA-C expressed by fetal trophoblast
- RhD and ABO blood group antigens influencing alloimmune responses

Specific genetic combinations may predispose to:

- Recurrent pregnancy loss (RPL)
- Recurrent implantation failure (RIF)
- Preeclampsia and placentation disorders
- Fetal growth restriction (IUGR)

What Is the Farabi Immunocompatibility Test?

A comprehensive NGS-based panel that simultaneously genotypes:

- KIR (all activating, inhibitory genes & pseudogenes)
- HLA-C (C1 / C2 allelic groups)
- RhD (including copy number variations)
- ABO (SNP-based genotyping)

This integrated approach provides a complete immunogenetic compatibility profile in a single assay.

Clinical Indications

Recommended as an adjunctive investigation in selected cases:

- Couples with unexplained recurrent pregnancy loss
- Repeated IVF failure, especially after euploid embryo transfer
- History of preeclampsia or placental insufficiency
- Suspected RhD or ABO incompatibility
- Surrogacy programs
- Donor oocyte or donor sperm cycles
- Advanced immunogenetic assessment in ART planning

Scientific Background (Evidence-Based Summary)

- Certain combinations, such as maternal KIR AA genotype with fetal HLA-C2, are associated in multiple studies with:
  - Impaired trophoblast invasion
  - Poor placentation
  - Increased risk of miscarriage or preeclampsia
- Activating KIR haplotypes (KIR B) interacting with HLA-C ligands may exert a protective effect
- RhD incompatibility is a well-established cause of alloimmunization and preventable fetal complications
- ABO incompatibility may contribute to mild hemolytic disease or early pregnancy loss in selected cases

Who Can Be Tested?

- Mother alone
- Mother and father
- Surrogate
- Donor (oocyte or sperm)
- Mother and fetal tissue (where available)

What the Report Provides

- Maternal KIR haplotype (AA / AB / BB)
- HLA-C ligand classification (C1 / C2)
- RhD and ABO compatibility status
- Risk stratification (low / moderate / high immunogenetic risk)
- Clear interpretive comments for clinicians

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