KIR Genotyping

Versiti offers DNA-based typing to identify the KIR genes present in an individual. Killer cell immunoglobulin-like receptors (KIR) control the ability of natural killer (NK) cells to recognize and kill malignant cells. The sensitivity of leukemic cells to killing by NK cells is determined in part by NK cell expression of KIR genes, and by the presence or absence of KIR-specific target molecules on leukemic cells.

KIRs are encoded by multiple polymorphic genes on chromosome 19. Because KIR genes segregate independently of HLA, matching individuals for HLA does not match for KIR. KIR genotyping may be useful for optimizing selection of bone marrow transplant donors to maximize the likelihood of a potent graft versus leukemia effect.

KIR haplotypes may be divided into 2 groups, A and B. Individuals homozygous for group A haplotypes have the A/A haplotype. Individuals homozygous for group B or heterozygous for A and B have the B/x haplotype. In large multicenter studies,[1-3] unrelated donors with KIR group B haplotypes were found to confer significant survival benefit to patients undergoing T-replete hematopoietic cell transplantation for acute myeloid leukemia (AML). The survival benefit is influenced by the number and position (centromeric/telomeric) of B-haplotype-associated genes in the donor. Thus, outcomes for AML transplant recipients may be optimized by using KIR B gene content and chromosomal position in donor selection.

Indications for testing:

Optimize selection of HLA-matched related or unrelated donors for hematopoietic cell transplantation (HCT), particularly for recipients with multiple donors who are potential HLA-matched or otherwise equivalent.

KIR genotyping results may allow selection of HCT donors according to their potential for:

- NK mediated graft-versus-leukemia effect
- Suppression of graft-versus-host disease
- Promotion of bone marrow engraftment

Test method:

PCR amplification - sequence-specific oligonucleotide probe (PCR-SSO).

Assay sensitivity and limitations:

Due to the polymorphic nature of KIR genes and haplotypes, not all KIR genes/alleles may be detected by this method.

For some interpretive models, HLA and KIR genotyping needs to be performed on both donor and recipient.

Reporting of results:

Positive/Negative indicated for 16 KIR genes

Note: Classification of individuals according to group A/A or group B/x haplotypes, chromosomal position of A/B associated genes (cen/tel), and total KIR B gene content is included in a comment. Assessment of KIR alloreactivity between donor/recipient pairs may also be included in a comment, if desired.

Specimen requirements:

14 ml EDTA (lavender top) whole blood or 4 buccal swabs.

Contact the laboratory if submitting cord blood or purified DNA.

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SHIP

Shipping requirements:

Room temperature samples are preferred, but samples may be refrigerated or frozen. For frozen or refrigerated samples, place the sample and the requisition form in plastic bags and seal, and surround with at least 5 pounds of dry ice for frozen samples or cold packs for refrigerated samples in an insulated container. Seal the container, place in a sturdy cardboard box and tape securely. Plastic tubes are required for frozen blood. Ship the package in compliance with your overnight carrier guidelines. Mark temperature requirements and address to:

Versiti Client Services
Histocompatibility Laboratory
638 N. 18th Street
Milwaukee, WI 53233-2121
800-245-3117, ext. 6250

ORDER

Required forms:

Please complete all pages of the requisition form.

CPT Codes/Billing/Turnaround time:

Test Code: 2377

CPT codes: For recommended CPT codes, visit the versiti.org/test-catalog

Turnaround time: 7 days

References:

1. Improved outcome in HLA-identical sibling hematopoietic stem-cell transplantation for acute myelogenous leukemia predicted by KIR and HLA genotypes. Hsu KC, et al. Blood. 2005;105:4878-4884.
2. Donors with group B KIR haplotypes improve relapse-free survival after unrelated hematopoietic cell transplantation for acute myelogenous leukemia. Cooley S, et al. Blood. 2009; 113: 726-732.
3. Killer Ig-like receptor (KIR) compatibility plays a role in the prevalence of acute GVHD in unrelated hematopoietic cell transplants for AML. Sun JY, et al. Bone Marrow Transplant. 2005;36:525-530.

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