KIR GENOTYPING

BloodCenter of Wisconsin offers DNA-based typing to identify the KIR genes present in an individual.

BACKGROUND:
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 genotype. Individuals homozygous for group B or heterozygous for A and B have the B/x genotype. In recent large multicenter studies, 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/telemeric) 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.

REASONS FOR REFERRAL:
Optimize selection of HLA-matched related or unrelated donors for hematopoietic stem cell transplantation (HSCT), particularly for recipients with multiple donors who are potential HLA-matched or otherwise equivalent.

KIR genotyping results may allow selection of HSCT donors according to their potential for:
  • NK mediated graft-versus-leukemia effect
  • Suppression of graft-versus-host disease
  • Promotion of bone marrow engraftment

METHOD:
PCR amplification - reverse sequence-specific oligonucleotide probe (PCR-rSSO)

LIMITATIONS:
• Due to the polymorphic nature of KIR genes and haplotypes, not all KIR genes/alleles may be detected by this method.
• HLA typing must have been performed on donor and recipient for interpretation of KIR genotyping results.
REFERENCE INTERVAL:
Positive/Negative 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.

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 (frozen samples) or cold packs (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:

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

TURNAROUND TIME: 5-7 days

CPT CODES: 81403

REFERENCES: