

MOLECULAR DIAGNOSTICS LABORATORY

at Children's Hospital Colorado



Chimerism Study by STR

Background

HLA-typing, red blood cell phenotyping, and karyotyping are commonly used methods to detect the early sign of relapse/engraftment failure. However, they cannot be used if the donor is HLA-identical or sex-matched, or when the BMT recipient is still transfusion dependent. Furthermore, their threshold of detection is typically higher than that of DNA-based analyses. To circumvent these problems, a method based on amplification of short tandem repeats (STR) by PCR was chosen. STRs are repetitive polymorphic sequences of 3 – 7 base pairs that are typically located within non-coding regions of human DNA. Alleles are differentiated by the number of copies of repeat sequences contained within amplified regions. STRs can be used to monitor bone marrow engraftment in the early stages of post-transplant. This technique provides a rapid, specific, sensitive and non-isotopic method to determine bone marrow chimerism after transplant. In an identical manner maternal cell contamination or twin zygosity can be determined by this molecular method.

Methodology

Quantitative, polymerase chain reaction/fragment analysis by capillary electrophoresis.

Assay Description

Patient DNA is extracted from peripheral blood, bone marrow, and/or CD3/CD33 enriched fractions with the QIAen DNA Tissue Kit or QIAgen QIAmp® DNA Micro Kit. PCR chimerism analysis is performed using the Beckman Coulter GeXP™ GenomeLab Human STR Primer Set followed by fragment separation by capillary electrophoresis. A written interpretation of the findings is reported. Graphs depicting chimerism results trends are available.

Indications

Monitoring of Post-BMT engraftment. Alternatively, detection of maternal cell contamination in prenatal specimens, analysis of genetic relatedness such as twin studies and specimen identification.

Reference Value

Donor Alleles detected: 0-100%

Host Alleles detected: 0-100%

Comparative reports for subsequent specimens are provided.

CPT Code

Pre and Donor: 81265

Post-Transplant: 81267

Additional Donor: 81266

Post-Transplant Sorted: 81268

Specimen Requirements

1-4mL bone marrow or 3-5mL whole blood in an EDTA (purple top) tube or sorted cell fractions. An initial study of pre-transplant patient and donor specimens is required to provide a baseline for subsequent post-transplant assays. Please call the laboratory before sending specimens for alternative specimen source testing.

Turn Around Time

3-5 Days

For Questions Please

Contact:

Amber Brand, Lab Outreach

Coordinator:

(720) 777-2723

Lara Brusca, MS, MB(ASCP)^{CM},

Laboratory Manager:

(720) 777-5799

Qi Wei, Ph.D., Scientific Director,

(720) 777-2721

Mark A. Lovell, MD, Medical

Director:

(720) 777-5468

Molecular Diagnostics

Laboratory:

(720) 777-2725

Transportation

Requirements:

Clients located *within* the Denver metro area: Send at room temperature. Clients located

outside the Denver metro area: Send with cool pack.

Ship to:

Children's Hospital Colorado

Clinical Laboratory

Attn: Molecular Diagnostics

Lower Level

13123 East 16th Avenue

Aurora, CO 80045