

Chimerism Testing by Short Tandem Repeat (STR) Genotyping

Chimerism refers to the ratio of recipient to donor hematopoietic cells after stem cell transplant (SCT). Assessing chimerism in peripheral blood and/or bone marrow via serial measurements is essential for the monitoring of donor cells after allogeneic SCT to determine successful engraftment, relapse of disease, or potential graft rejection. Serial testing provides a trend of results over time that is useful for monitoring. A transplant recipient is said to have full chimerism when there are exclusively donor cells present posttransplant. Similarly, mixed chimerism occurs when there is a combination of recipient and donor cells present. Testing to determine donor and recipient genotypes prior to transplantation must be performed to enable differentiation posttransplant.

Testing Considerations

Polymerase chain reaction (PCR) methods are more sensitive than fluorescence in situ hybridization (FISH). Additionally, FISH requires sex-mismatched donor-recipient pairs. Further, short tandem repeat (STR) genotyping is more sensitive than using human leukocyte antigen (HLA) markers for monitoring engraftment because the recipient and donor are HLA matched.

Test Description

These tests consist of a panel of STR markers with allele sizes that differ among individuals.

ARUP Laboratories' chimerism tests include PCR followed by capillary electrophoresis (CE). CE detects the following markers: D8S1179, D21S11, D7S820, D3S1358, D13S317, D16S539, D2S1338, D19S433, D18S51, D5S818, CSF1PO, TH01, vWa, TPOX, FGA, and one gender marker (amelogenin).

Featured ARUP Testing

[Chimerism, Donor 3005462](#)

Method: Polymerase Chain Reaction (PCR)/Fragment Analysis

Use to assess donor genotype

[Chimerism, Recipient, Pretransplant 3005449](#)

Method: Polymerase Chain Reaction (PCR)/Fragment Analysis

Use to assess recipient genotype before transplant

[Chimerism, Additional Donor 3005468](#)

Method: Polymerase Chain Reaction (PCR)/Fragment Analysis

Use to assess donor genotype for additional donor

[Chimerism, Posttransplant 3005454](#)

Method: Polymerase Chain Reaction (PCR)/Fragment Analysis

Use to monitor engraftment of donor cells post allogeneic SCT

Pretransplant genotype of recipient and donor are required for comparison.

For additional posttransplant tests, refer to the [Laboratory Test Directory](#).

Test Interpretation

Analytic Sensitivity

98%

Results

Tests	Results
Chimerism, Donor 3005462	Testing provides the number of informative markers identified for the donor/recipient pair.
Chimerism, Recipient, Pretransplant 3005449	
Chimerism, Additional Donor 3005468	
Chimerism, Posttransplant 3005454 (For additional posttransplant tests, refer to the Laboratory Test Directory .)	Testing provides the number of informative markers used in analysis and lists the mean percentage of recipient and donor cells present in the sample (95% confidence interval). Correlation with clinical status and consideration of the time interval between SCT and chimerism testing is necessary for proper interpretation of results.

Limitations

- Cannot be used if donor and recipient are identical twins
- Posttransplant testing requires a pretransplant sample for comparison.
- Minor cell populations consisting of <2% of total population may not be detected.
- Diagnostic errors can occur due to rare sequence variations.

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