

# Chimerism Testing by Short Tandem Repeat (STR) Genotyping

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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).

## Test Interpretation

### Analytic Sensitivity

98%

### Results

Tests	Results
Chimerism, Donor <a href="#">3005462</a>	Testing provides the number of informative markers identified for the donor/recipient pair.
Chimerism, Recipient, Pretransplant <a href="#">3005449</a>	
Chimerism, Additional Donor <a href="#">3005468</a>	
Chimerism, Posttransplant <a href="#">3005454</a> (For additional posttransplant tests, refer to the <a href="#">Laboratory Test Directory</a> .)	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.

## 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](#).

## 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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