POST-TRANSPLANT CHIMERISM MONITORING - REAL-TIME QPCR OR STR?

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Analysis of chimerism following allogeneic hematopoietic stem cell transplantation (allo-HSCT) is routinely used and holds high informative value. It plays a pivotal role in monitoring engraftment and assessing the risk of relapse, underscoring the critical need for sensitivity and accuracy in the employed methods.

The aim of our study is to evaluate the informativeness and practical utility of the real-time quantitative PCR (qPCR) method for chimerism level analysis.

We conducted our analysis using samples obtained from donor-recipient pairs who were routinely monitored following allo-HSCT via PCR-STR (AmpFLSTR Identifiler Plus kit by Thermo Fisher). Additionally, quantitative real-time PCR analysis was performed using GenDx's KMR kits, specifically KMRtype for selecting informative markers and KMRtrack for chimerism monitoring. Descriptive statistics and correlation analysis were employed to summarize the results.

Our findings revealed that both methods successfully identified at least one informative marker for each donor-recipient pair. Notably, a strong correlation ($r>0.99$) was observed between the results obtained from the two methods, albeit with slight discrepancies within the range of 0% to 9.0%. A higher level of discrepancy was found in samples with more than 10% mixed genetic profiles (median 5.42%, range 1.3%-9.0%) compared to samples with less than 10% (median 0.62%, range 0%-2.6%).

In conclusion, our preliminary results underscore the sensitivity and informativeness of real-time qPCR-based chimerism analysis. Notably, higher discrepancies were observed in samples characterized by significant mixtures of donor and recipient DNA. The potential clinical implications of these discrepancies will be subject to further analysis. Nevertheless, our preliminary data demonstrate promise for the incorporation of the real-time qPCR method into routine clinical practices for post-transplant chimerism monitoring.