

## **EVALUATION OF A DUAL-sjTREC PROBE ASSAY AND A SINGLE-TUBE NESTED PCR ASSAY FOR AGE PREDICTION**

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Quantitation of signal-joint T cell receptor excision circle (sjTREC) for age prediction of the unknown donor, was first reported in 2010 and more recently in 2016, where at least 50 ng of DNA template was used<sup>1,2</sup>. These quantitation assays are too insensitive for routine crime casework as, in contrast, approximately one ng of DNA is sufficient to generate a DNA profile. In addition, different declining trends of sjTREC with age were observed when different ethnic population samples were evaluated<sup>3,4</sup>. Hence, there is the need to establish a regression model using the Singapore local populations.

In this study, a dual-sjTREC probe assay and a single-tube nested PCR assay were designed to increase the sensitivity over current sjTREC quantitation assays. Genomic DNA isolated from blood samples from local Singapore Chinese, Malay and Indian populations, aged between 0 to 98 years old, were subjected to a multiplex qPCR for the quantitation of sjTREC and Albumin (as the single copy gene for normalisation). Regression models were established to ascertain the prediction accuracy as well as the trend of sjTREC with age for the local population.

The dual-sjTREC probe assay gave positive results with only 12 ng of DNA, belonging to 67 year old donor, while the single-tube nested PCR assay increased the sensitivity of sjTREC quantitation by approximately five-fold. This study also suggested that the Singapore Indian population had a different sjTREC regression model as compared to the Singapore Chinese and Malay.

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