COMPARISON OF VARIOUS STR KITS AND ANALYSIS CONDITIONS FOR LOW TEMPLATE DNA SAMPLES

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Because low template DNA samples are contained less than 100pg of DNA, obtaining a reliable short tandem repeat (STR) profile from low template DNA samples is very difficult. In this study, we have found to effective methods by changing amplification conditions using various commercially available STR kits.

9947A control DNA and DNA extracted from blood were manually diluted to DNA concentrations of 31.2, 62.5, 125, 250, 500 and 1000pg per micro-litre(pg/$\mu\ell$). Full STR profiles were obtained from 1ng/$\mu\ell$ to 125pg/$\mu\ell$ of DNA concentration using five commercially available kits (Identifiler®, Profiler®, ProfilerPlus®, SGMProfiler®, PowerPlex16®) and two commercial kits for trace DNA samples (IdentifilerPLUS® and Hot-Start PowerPlex16®).

The results with 31.2, 62.5pg of template DNA have observed peak height imbalance and allele drop-out, however, on two commercial kits (IdentifilerPLUS® and Hot-Start Powerplex16®) the result have shown reliable data. Low template DNA samples with extended PCR cycle number increase allele drop-in and allele drop-out according to concentration and status of DNA. Therefore, results should be interpreted prudently and further study is needed.