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BOOSTER PCR FOR LOW-COPY NUMBER SAMPLES

Roland van Oorschot, Catia Cardeira, Kaye Ballantyne and John Mitchell
Biology Division, Victoria Police Forensic Services Department, 31 Forensic Drive, Macleod, VIC 3085, Australia

PCR techniques allow the analysis of degraded and minute DNA samples. A growing amount of research is being conducted into modifying and optimising standard PCR procedures in order to analyse smaller quantities of template DNA, and genetic profiles can now be obtained from minute quantities of biological material. One of the major issues in PCR relates to primer specificity, and there are a number of suggested methods that can enhance amplification, product yield and thus increase the likelihood of more complete trace DNA profiling. During initial cycles of PCR, primers can form non-specific interactions with template DNA or other primers within the multiplex, which reduces the final yield of product. One approach to reducing the non-specific binding is booster PCR. This technique involves starting the amplification with very low primer concentrations, and increasing the concentration partway through the amplification to allow complete amplification. Previously, this approach has increased target yield and decreased allele dropout with microbial samples. A modified booster PCR protocol has been applied to trace DNA and mixture samples, using the AmpFlSTR Profiler Plus multiplex system. Increases in peak heights and numbers of alleles were observed from the majority of samples, with no significant increase in the level of artefacts. Thus, booster PCR can increase the profiling success of forensic samples containing trace DNA quantities.