

LOW COPY NUMBER (LCN) STR TYPING: MERITS AND APPLICATIONS

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Since 1999 we have adopted a strategy for amplifying DNA and interpreting DNA profiles produced from samples containing DNA at a level less than can be reliably quantified.

A process of duplicate amplifications with the derivation of a consensus profile has been shown to adequately accommodate issues such as allelic dropout, heterozygote peak imbalance and spurious contamination which result from the sensitivity of the technique and the stochastic variation associated with amplifying small amounts of DNA. We illustrate the utility of the approach and the safeguards that must be adopted using actual casework examples.

Selection of samples appropriate for LCN testing has led to a change in our approach to crime scene management and crime stain targeting. In particular, we view the use of LCN primarily as an intelligence tool to assist the process of police investigation. In many ways, this is a departure from the traditional use of DNA profiling as an evidential tool.

Consequently, the inferences drawn from LCN DNA profiling are cautious and are specific to the context of the case in question. Because the amount of DNA tested is typically just a few cells, this means that usual assumptions based on presumptive body fluid tests cannot be made. Furthermore, it is problematical to make assumptions about transfer and persistence of DNA – transfer may not be coincident with the crime event itself. This raises the possibility of “innocent” or adventitious transfer to consider. The relevance of the evidence is crucial to LCN interpretation.