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Title:

ANALYSIS OF LOW-COPY NUMBER FORENSIC DNA PROFILES

Abstract:

Recently, forensic DNA profiling has been used with far smaller volumes of DNA than was previously thought possible. This "low copy number" profiling enables DNA to be recovered from the slightest traces left by touch or even breath, but brings with it serious interpretation problems that courts have not yet adequately solved. These problems have contributed to important cases collapsing or convictions being overturned, for example in *R v Hoey* in Northern Ireland, and the case of Knox and Sollecito in Italy. The most important challenge to interpretation arises when either or both of "dropout" and "dropin" create discordances between the crime scene DNA profile and that expected under the prosecution allegation. Stochastic artefacts affecting the peak heights in the electropherogram (epg) are also problematic, in addition to the effects of masking from the profile of a known contributor. I will outline a framework for assessing such evidence, based on likelihoods that involve dropout and masking by stutter and other artefacts, and discuss possible options for modelling dropin. I will apply it to casework examples and reveal deficiencies in some reported analyses.