DEVELOPING A LIKELIHOOD RATIO APPROACH TO 'FAMILIAL SEARCHING' OF A DNA DATABASE USING THE ADVANCED FUNCTIONALITY OF FSS-IBD

Maguire, C. N., McCallum, L. A., Jones, K. E., Storey, C. L.
Forensic Science Service, Wetherby, West Yorkshire, UK

In common with many laboratories around the world, FSS uses kinship analysis to resolve disputed paternity cases, immigration and nationality issues and forensic casework. Kinship analysis is routinely used to assist in the identification of recovered remains in missing person cases and mass fatality enquiries.

FSS-ibd[1] is a software application, developed by the FSS in conjunction with City University, London; designed to automate both simple and complex kinship analyses. Using a graphical interface supported by 'Bayes Net' mathematics, even the most complex of relationship analyses can be undertaken by 'drawing' the pedigrees for the hypotheses under test.

The FSS-ibd application allows the user to define the STR chemistry and individual allele frequencies, mutations and population substructure (FST or 0 corrections) and to take account of rare alleles, either by including minimum default frequencies or by Nicholls and Balding size bias corrections.

The functionality of FSS-ibd has been extended to allow the user to input a 'batch' of DNA profiles to a pre-determined relationship. This 'Multi-profile Wizard' processes each of the DNA profiles in the batch file against the hypotheses under test, ranking the output by likelihood ratio.

Examples of the use of the extended functionality of FSS-ibd are shown and the operational success in using this application is demonstrated by reference to two casework examples

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[1] Maguire, C.N., Woodward, M., (2008) DNA-based kinship analysis, Profiles in DNA **11** (1) 4-6