

Northumbria Research Link

Citation: Maguire, Christopher, McCullum, L. A., Jones, K. E. and Storey, C. L. (2009) Developing a Likelihood Ratio Approach to 'Familial Searching' of a DNA Database Using the Advanced Functionality Of FSS-ibd. In: 20th International Symposium on Human Identification, 12-15 October 2009, Las Vegas, NV.

URL: <http://www.promega.com/products/pm/genetic-identit...>
<<http://www.promega.com/products/pm/genetic-identity/ishi-conference-proceedings/20th-ishi-poster-abstracts/>>

This version was downloaded from Northumbria Research Link:
<https://nrl.northumbria.ac.uk/id/eprint/5361/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)

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-ibd¹ 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

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