



Dynamics of molecular genetic diversity in the East Midlands, UK: forensic and paternity implications

S.S. Mastana*, D.R. Lee

*Human Genetics Laboratory, Department of Human Sciences,
Loughborough University, Loughborough LE11 3TU, UK*

The objectives of this investigation were to establish the database of minisatellite (VNTRs), microsatellite (STRs), and ALU insertion allele frequencies for the regionally sub-divided populations of the East Midlands, which is suitable for population genetic and forensic investigations. The secondary objective was to determine if Caucasian sub-population heterogeneity exists within the United Kingdom, within Europe and world Caucasian and racial populations at these loci. To evaluate the efficiency of these markers for forensic and paternity purposes in the East Midlands populations.

Blood samples (600) were taken at random from the Caucasian East Midlands populations (five sub-populations). Using standard molecular genetic techniques, we analysed MS1, MS31, YNH24, MS43a VNTRs and HUMTH01, F13A, F13B, FES, LPL, VWA31 and CSF1PO STRs. Alu insertion polymorphisms studied included, ACE, TPA, PV92, D1, APO and FXIIIIB. Overall efficiency of these loci for forensic and paternity work in the East Midlands populations is at a par with other Caucasian populations. Average value of PE is more than 0.999 and cumulative PM was 5.3×10^{-13} for UK populations with some regional and local variation. Significant heterogeneity chi-square values for MS43a, MS1 and YNH24 were found in a large number of FBI bins in UK Caucasian, European, world Caucasian and UK racial population comparisons. Overall comparisons provided interesting results suggesting caution should be exercised in the usage of pooled or general population databases for forensic and paternity investigations.

* Corresponding author. Tel.: +44-1509-223041; fax: +44-1509-223941.
E-mail address: S.S.Mastana@lboro.ac.uk (S.S. Mastana).