A First Study of Italian Frequencies Using the AmpF*l*STR™ Profiler to be Used in Forensic Applications

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A population study of the distribution on nine genetic loci analyzed by PCR using the commercial AmpF*l*STR™ Profiler™kit (by ABD Perkin Elmer) was evaluated in 619 unrelated Italian individuals. The AmpF*l*STR™ Profiler™ kit co-amplifies specific polymorphic regions of the nine loci which D3S1358, vWA, FGA, TH01, TPOX, CSF1PO, D5S818, D13S317, D7S820 with the X-Y homologous gene Amelogenin for sex determination.

A preliminary study to evaluate STR DNA technology for the potential construction of an Italian DNA database of criminals has been started with the collection of blood samples from each Italian region and analyses are being carried out on the STR loci of the AmpF*l*STR™ Profiler™ kit. The use of forensic kits which co-amplify several loci for DNA typing is very important in forensic casework because not only does it use the smallest amount of DNA extract, but it also generates extremely informative results.

STR alleles were amplified by the GeneAmp PCR System 9600 PE in accordance with the protocol in the User's Manual AmpF*l*STR™ Profiler™ and allele detection was done by a 377 ABI Prism® DNA Sequencer.

Discussed will be results of an extensive population of over 600 individuals used to determine for each locus allele frequency, the observed alleles, the discrimination power (PD), the observed heterozygosity (Obs. h), and matching probability (pM), before it may be routinely employed in human identification in Italian forensic casework.

STR Loci	Observed Alleles	Discrimination Power (PD)	Obs. Heterozygosity (Obs. h)	Matching Probability (pM)
D3S1358	8	0.92	0.77	0.084
vWA	9	0.93	0.82	0.066
FGA	16	0.96	0.85	0.037
TH01	8	0.92	0.82	0.079
TPOX	7	0.82	0.64	0.182
CSF1PO	8	0.87	0.71	0.129
D5S818	8	0.87	0.71	0.134
D13S317	7	0.92	0.80	0.079
D7S820	8	0.93	0.79	0.068
Combined		0.9999999997		2.74×10^{-10}

This study demonstrates the utility of highly informative STR loci in forensic investigations.