

Genetic attributes of Caucasic and Aboriginal populations of Argentina concerning loci D13S317, D7S820 and D16S539 included in the new SilverSTR™ III Multiplex

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Since its beginning in 1985, DNA based molecular identification approaches has experienced rapid and drastic changes. Initially, the trends were oriented towards standardization, reflected in the shift from Multi Locus Probe systems (MLP) to Single Locus Probe (SLP) approaches. Then, the development of the PCR based techniques highly increased the sensitivity allowing recovery information from traces of biological stains. Short Tandem Repeats (STRs) became the forensic tool for human identification, the possibility of multiplexing allowed improved throughput and increased the Discrimination Power by checking multiple loci at once. The limitation of each tetranucleotide STR is the reduced number of alleles and the preponderance of one or two of them. This situation can be circumvented by increasing the number of loci to be considered. The first highly robust and efficient STR multiplexes commercially available were CTT (CSF1PO, TPOX and TH01) and FFv (F13A01, FES/FPS and vWA). Recently, the new SilverSTR™ III STR system (D13S317, D7S820 and D16S539) supplemented the former systems. The aim of this work was two fold: a) Investigate the genetic attributes of the above mentioned loci in aboriginal (Mapuche, Tehuelche and Wichi tribes) and Caucasic (Buenos Aires Metropolitan Area) inhabiting Argentina. B) Compare accumulative Power of exclusion and Matching probabilities (mP) of the three triplexes with a set of six minisatellite SLPs (YNH-24, PH-30, LH-1, MS-1, TBQ-7 and EFD-52). Calculated mP value of the combined triplexes is 434×10^{10} (or 1 in 2.26×10^9) for metropolitan population; this figure is equivalent to that obtained with about three single locus probes. Combined power of exclusion of SilverSTR™ III system was 91% and Typical Paternity Index across all three triplexes was 395.

In conclusion, the combination of the three multiplexes allows reliable results for forensic identification and also contributes for accurate paternity testing.