

Investigation of SNP Variations in Twins for Forensic Applications

Prakaymars Panumars

Graduate student, Department of Integrated Science, Faculty of Science, Khon Kaen University, Khon Kaen 40002, Thailand

Rachadaporn Benchawattananon

Department of Integrated Science, Faculty of Science, Khon Kaen University, Khon Kaen 40002, Thailand

Khemika Lomthaisong

Department of Integrated Science, Faculty of Science, Khon Kaen University, Khon Kaen 40002, Thailand

Abstract:

Personal identification based on STR analysis has been routinely worked in forensic investigation worldwide. However, in case of monozygotic twins where they both share the same genetic profile, individual identification cannot be achieved. Recently, the SNP variations for monozygotic twin identification has been reported using next generation sequencing. Nevertheless, this method requires expertise. Hence, this study aims to investigate the SNP variations in monozygotic twins by using SNP typing kit for human identification. Biological samples including blood, buccal cells and hairs were collected from twelve pairs of monozygotic and dizygotic twins from volunteers in northeastern of Thailand. DNA was extracted from the samples and subsequently analyzed for the genotypes of 44 SNPs using iPLEX® Pro Sample ID Panel. From these data, the forensic parameters including the percentage call rate from analyze samples, genotype profiling, match probability and allele frequency across different SNPs were investigated. The results indicated that biological sample from one pair of monozygotic twins exhibited differences in genotype profiles in both of blood and hair. Similarly, in one pair of dizygotic twins, genotype profiles showed differences in buccal cells and hair.

Keywords:

SNP marker; Personal identification; Forensic DNA analysis; Monozygotic twin.