



**The College of Graduate Studies and the College of Science Cordially Invite You
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Master Thesis Defense

Entitled

*FORENSIC EVALUATION OF 6-DYE CHEMISTRY KIT COMPOSED OF 23 LOCI WITH CASEWORK
SAMPLES*

By

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Abstract

Short Tandem Repeats (STR) are nucleotides sequence with repeats of various length ranging from 2 to 8 base pair, found surrounding the chromosome centromere. It represents approximately 3% of human DNA and occur once in every 10,000 nucleotides and their high degree of polymorphisms makes them informative. STR markers have been the genetic markers of choice in forensic DNA analysis for the past twenty years, and has proven to be an extremely discriminating method for human identification in forensics. The main objective of this thesis is to evaluated a six-dye STR multiplex assay composed of 23 autosomal STR loci, 1 insertion/deletion polymorphic marker on the Y chromosome, Amelogenin and two internal quality control markers (IQCS and IQCL) with samples lifted from crime scene. The study investigates the performance of several tests including: sensitivity, reproducibility, stability, heterozygote balance, precision, mixture study and concordance study. This study showed that the assay is reproducible, sensitive, accurate and robust. Sensitivity testing showed that a full profile can be obtained even with 63 pg of human DNA. Heterozygous allele balance varied between 99-60% for samples with total DNA input ranging from 1 ng to 500 pg. It is also suitable for mixture study. All the alleles of minor contributor were called for ratios of 1:1, 1:3 and 3:1. overall this study demonstrate that this multiplex assay is robust, reliable and suitable as an assay for human identification with forensic casework samples and it is suitable to be used in Dubai forensic Laboratory and other forensic laboratories in the world.

Keywords: STR, Sensitivity, Heterozygote balance. LOD, LOQ, Mixture study, Concordance study.