Forensic Research-2013

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Forensic Research & Technology

October 7-9, 2013 Las Vegas, USA

# DIP–STR: Highly sensitive markers for the analysis of unbalanced genomic mixtures

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## Abstract

In forensic genetic the characterization of unbalanced mixed stains remains an important area where improvement is imperative. Biological evidences collected to identify the perpetrator of an aggression, of a homicide or of a sexual assault fail to do so when the DNA of the aggressor is mixed to large quantities of a second DNA, most likely the DNA of the victim. If this ratio is smaller than 1:10 it is not possible to obtain the autosomal DNA profile of the minor DNA contributor by using standard forensic genetic methods. To address this issue, we developed a molecular marker, named DIP-STR that relies on pairing deletion/insertion polymorphisms (DIP) with STR. This novel analytical approach allows for the unambiguous genotyping of a minor component in the presence of a major component, where DIP-STR genotypes of the minor were successfully procured at ratios up to 1:1000. The compound nature of this marker generates a high level of polymorphism that is suitable for identity testing. Here we describe a preliminary list of DIP-STR and their performance at casework resolution of both simulated and real samples.

## Biography

Diana Hall received her Ph.D. in Forensic Genetics from the Catholic University of Rome for her research on background Linkage Disequilibrium across human populations, carried out at the Department of Human Genetics of the University of Chicago. She continued her postdoctoral studies on disease mapping of complex traits at the Rockefeller University of New York. Since 2010, Diana Hall is responsible of the research and development at the Forensic Genetics Unit of the University Hospital of Lausanne. Her latest interests are novel methodological approaches for DNA mixture resolutions.