APPLICATION OF PRECR™ REPAIR ENZYME TO FORENSIC EVIDENCES

Hee-Yeon Park, Jong-Keun Jung, Mi-Jung Kim, Sumin Lee, Byung-Won Chun

DNA Analysis Section, Forensic Medicine Division, Busan institute, National Forensic Service, 50, Geumo-ro, Mulgeum-eup, Yangsan-si, Gyeongsangnam-do, Republic Korea

Forensic evidence is sometimes exposed to various environments that may produce lesions in the DNA. Successful STR typing is an important issue for damaged DNA. Trying to generate a reliable STR profile with only a degraded DNA sample is crucial. In this study, PreCR™ repair enzyme was applied to a variety of damaged samples to obtain a successful STR result. The PreCR™ repair mix is an enzyme cocktail formulated to repair damaged DNA, and PreCR™ is active on a broad range of DNA damages. A total of 122 samples were selected for the analysis, including towels, cups, hairs, cigarette butts, clothings, etc. We analyzed STR allele recovery with repair reaction and Identifiler® plus amplification kit. Also, DNA quantification was performed with the Quantifiler® kit. As a results, 89 samples repaired with the PreCR™ kit. Some lost alleles restored and STR peak heights increased upon repair with this kit. In contrast, non-specific peaks were observed in some other samples. For 18 samples among 42 samples, DNA concentration was increased after the recovery. In conclusion, PreCR™ repair enzyme will be efficiently applied to forensic samples which were damaged by various environments. However, the results were sporadic and sometimes deleterious. Therefore, the results of STR typing after the enzyme treatment must be carefully analyzed.