VALIDATION OF A RAPID DIRECT PCR AND A MULTIPLEX SINGLE BASE EXTENSION METHOD FOR ABO BLOOD GENOTYPING

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The ABO blood group system has been one of widely used methods in the case of crime scene investigation since it was discovered by Landsteiner in 1900. Recently, Lee and Shin (2011) reported a rapid direct PCR typing and a multiplex single base extension (SBE) method that distinguishes single nucleotide polymorphism (SNP) in A and B glycosyltransferases which can determine A, B and H antigen secretor. To compare the usefulness of both methods, we used randomly selected one hundred blood samples donated by Korean Red Cross Services with known ABO blood type by previous serological tests. All of the samples were investigated for mutations in exons 6 and 7 of the ABO locus located at chromosome 9 to ABO blood genotyping and showed whole concordances in both methods. The standard DNA (9947A) was serially diluted from 1ng to 30pg and used for PCR to identify sensitivity of the process. The minimal amount of DNA needed to get reliable results was estimated to be 500pg and 125pg for rapid direct PCR typing multiplex SBE method respectively, with no allelic drop-in or drop-out. In addition, we tested both methods for animal ABO blood typing with diverse animals such as dog, cat, horse, chicken, chimpanzee and orangutan. Among 10 animals tested, orangutan and chimpanzee showed reliable results in a multiplex SBE method while it showed unreadable results in rapid direct PCR typing method. ⌘