

## GETTING PARTIAL PROFILES FROM DNA MIXTURE IN SOLVING COLD CASES

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Cold cases usually keep unsolved for a long time because they lack of strong evidence. DNA mixture, according to its fast development, has helped a lot in solving cold cases as it can get profile from touch samples and match the suspect directly or get hit combined with DNA database. Here we report a new way of using DNA mixture. Our institute reviewed and picked up 21 unsolved cold cases from 1235 cases happened 5 years ago that had a mixture STR profiles yet could not get any clear results, from which we get 19 single profiles after major component separation. What excited us is that searching the profile from the DNA database and we get 3 hits and finally get all the 3 cold cases solved thorough our method. Our way can be implemented through the following steps:

1. Try to list the partial profiles of major contributor(s) or/and minor contributor(s) from difficult 2 (existing random amplification) or 3 contributors' profiles, according to the peak height and peak area of multiple parallel amplification results.
2. The partial profiles must have 7 loci at least. However, the loci can be grouped according to the principle of permutation, which will constitute different profiles.
3. Type the target partial profiles into DNA database in our country to get hit by magnifying the tolerance properly ( $\leq 2$  pairs).
4. Check whether the other sites are consistent after the database results. At last, it has to be determined whether the database results are reliable, combined the background information of the cases.