
DEVELOPMENT OF PORTABLE STR ANALYSIS SYSTEM AIMING ON-SITE SCREENING

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Currently we are working on to develop a multi source human identification system, which could be use for on site screening, aiming for safer world. To achieve the goal, we have developed almost all systems, except for a portable and high speed human DNA analysis system, which could be utilised on site. For develop such STR analysis system, we are currently working on the following three technology, using lab on chip method. (1) DNA extraction mechanism using newly developed microfluidics (2) High speed micro PCR (3) Microfabricated capillary electrophoresis(mCE) achieving 2bp resolution Currently, we are testing with three independent prototype chips. Using theses prototype chips, it is demonstrated that DNA extraction is achieved within 7 min., PCR is achieved within 18 min. and mCE is achieved within 5 min, 30 min. in total. We are planning to reduce the process time and to combine all three technology together. In this development, we have to pay attention not only high speed process and miniaturising the mechanism, but also many aspect of peculiar to on site screening, such as, avoiding contamination, easy to use, long preservation time and chip fabrication cost. We would like to thank to Dr. Kentaro Kasai, Dr. Kazumasa Sekiguchi, Dr. Natsuko Mizuno, Dr. Hiroaki Senju of the National Research Institute of Police Science, JAPAN, for their valuable and generous discussion.