D42 Program Design for the DNA-STR Genotypes Searching System on Criminal Scene Application

Wen-Hsiung Ho, MS, Scientific and Technical Research Center (Department 6), Ministry Justice Investigation Bureau, PO Box 340, No. 74 Chung-Hua Road, Hsin-Tien City, Taipei 231, Taiwan Republic of China; and Chen-Bin Wang, BS, Chun-Ming Tsao, MS, Chang-En Pu, MS, and David H. Liu, PhD, Ministry Justice Investigation Bureau, NO.74, Chung-Hua Road, Hsin-Tien, Taipei 231, Taiwan, Republic of China*

Attendees will learn how to manipulate valuable casework data with databases and design other evidence to collect. This information will be compiled from routine cases by using the DNA-STR genotypes Searching System. The authors offer the DNA-STR Searching Genotypes System which provides high efficiency, friendly operational procedures, absolute security, and convenience. The authors hope to integrate the resources of forensic science in Taiwan and keep feasible connection with worldwide related databases via Internet.

In the past several decades, short tandem repeat (STR) markers have become a tactful strategy for forensic DNA typing including individual information in forensic caseworks and paternity tests. However, the DNA databases are built of STR loci based on CODIS 13 and Y chromosome STR loci in forensic laboratories. These databases are eagerly shared with other forensic labs in Taiwan, aiming to establish local forensic data network for rapid identification of suspects, victims of catastrophe, and nameless human remains. In order to easily and feasibly manipulate these valuable databases, the authors developed a new automatic computer program, which is capable of integrating the current STR loci databases with pending data, meanwhile, searching and storing what is desired. The rapid, fuzzy and automatic computer program, so called the DNA-STR genotypes Searching System, is originally based on the platform of the Borland company software written for analyzing the present commercially available multiplex STR kits (from Applied Biosystems and Promega company). The commercial product of Borland company, Delphi Professional software, is a complete rapid application development (RAD) environment for the visual design, com- pilation, and debugging of programs written in the Delphi and C lan- guages. Programs can be targeted for Win32 and Microsoft .NET. The Professional edition also provides RAD database development with basic local database connectivity.

Albeit the self-developed DNA Search System is designed on the basis of Delphi Professional software, there are various novelties coming from it. On the one hand the designed program can be applied to search local databases at each client site of local personal computer with authority control at the server end and on the other hand it can be con- nected and shared with other international DNA databases via web net. There are five icons available to key in individual data and various searching demands for comparison with either single case or multiple cases (group) to the whole database. The efficiency of the program has been tested by operating ten unidentified data to seven thousands indi- viduals STR loci database and it was estimated in less than three minutes to finish. The authors are also planning to amplify the functions of the program by combing the ability of automatically calculating the index of the Power of Discrimination/Exclusion, Probability of the match, and the other statistic applications with this searching system for forensic cases and paternity tests. The excellent characteristics of the program are high efficiency, friendly operational procedures, absolute security, and convenience.

Short Tandem Repeat (STR), DNA Database, Computer Program

 ** Presenting Author*