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Organizing the Argentinean Combined DNA Index System (CODIS)

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Abstract. As proposed our Latin American Society for Forensic Genetics in June 17th, 2003, last year the Argentinean Minister of Justice, Security and Human Rights signed the Resolution #415/2004 (full text available in Spanish in www.slagf.org), which created the DNA Fingerprint Registry, similar to the American CODIS. The Registry blends computer and DNA technologies into an effective tool for fighting violent crime. The system uses two indexes to generate investigative leads in crimes where biological evidence is recovered from the crime scene. The Convicted Offender index contains DNA profiles of individuals convicted of felony sex offenses (and other violent crimes). The Forensic index contains DNA profiles developed from crime scene evidence. The Registry utilizes computer software to automatically search these indexes for matching DNA profiles. Like the American CODIS, this is a system of pointers; the database only contains information necessary for making matches. Profiles stored contain a specimen identifier, the sponsoring laboratory's identifier, the initials (or name) of DNA personnel associated with the analysis, and the actual DNA characteristics. Matches made among profiles in the Forensic Index can link crime scenes together; possibly identifying serial offenders. Based on a match, police can coordinate separate investigations, and share leads developed independently. Matches made between the Forensic and Convicted Offender indexes ultimately provide investigators with the identity of the suspect(s). Following are the major enhancements planned for the next years: There are differences among province laws, so the first step is to make them compatible.

- Optimize software performance for Local, Province and National Indexes.
- Select the labs with high-quality standards. Quality controls in Latin America are conducted by the Latin American Society for Forensic Genetics and the Spanish and Portuguese Speaking Group of the ISFG.

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- Training courses to DNA analysts from participating laboratories. Until now, the training courses in Latin America are organized by the Latin American Society for Forensic Genetics.
- Begin operation of the National DNA Index System.
- Proliferate the installed base to include all crime laboratories performing DNA analysis.

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Keywords: DNA testing; DNA profiles; CODIS; Argentina; Forensic index; Offender index; DNA Quality controls; DNA standard

1. Introduction

CODIS generates investigative leads in crimes where biological evidence is recovered from the crime scene using two indexes: the forensic and offender indexes.

The **Forensic Index** contains DNA profiles from crime scene evidence.

The **Offender Index** contains DNA profiles of individuals convicted of sex offenses (and other violent crimes) with many states now expanding legislation to include other felonies.

Matches made among profiles in the Forensic Index can link crime scenes together; possibly identifying serial offenders. Based on a match, police in multiple jurisdictions can coordinate their respective investigations, and share the leads they developed independently. Matches made between the Forensic and Offender indexes provide investigators with the identity of the perpetrator(s). After CODIS identifies a potential match, qualified DNA analysts in the laboratories contact each other to validate or refute the match.

2. Antecedents

As proposed our Latin American Society for Forensic Genetics in June 17th, 2003, last year the Argentinean Minister of Justice, Security and Human Rights signed the Resolution # 415/2004 (full text available in Spanish in www.slagf.org), which created the DNA Fingerprint Registry, similar to American CODIS.

In USA, the DNA Identification Act, which was included in the 1994 Crime Bill, authorizes the FBI to establish the CODIS for law enforcement purposes. In Argentina, the Ministry authorizes the Federal Police to organize the database.

CODIS began as a pilot project in 1990, serving 14 state and local DNA laboratories. Currently, CODIS is installed in almost all states.

As of May 2005 the Profile Composition was the following: Forensic Profiles: 108,976; Convicted Offender Profiles: 2,390,740.

Ultimately, the success of the CODIS program will be measured by the crimes it helps to solve. CODIS's primary metric, the "Investigation Aided", is defined as a case that CODIS assisted through a hit (a match produced by CODIS that would not otherwise have been developed). As of May 2005, CODIS has produced over 22,800 hits assisting in more than 24,700 investigations.

3. Organization and standards proposed

Throughout its deliberation concerning these quality standards, the American DNA Advisory Board recognized the need for a mechanism to ensure compliance with the standards. An underlying premise for these discussions was that accreditation would be required to demonstrate compliance with the standards and therefore assure quality control and a quality program.

Quality controls in Latin America are conducted by the Latin American Society for Forensic Genetics (www.slagf.org) and the Spanish and Portuguese Speaking Group of the ISFG (www.gep-isfg.org).

The standards describe the quality assurance requirements that a laboratory, which is defined as a facility in which forensic DNA testing is performed, should follow to ensure the quality and integrity of the data and competency of the laboratory.

Forensic DNA identification analysis currently involves forensic casework and convicted offender analyses. These complementary functions demand adherence to the highest analytical standards possible to protect both public safety and individual rights.

3.1. *Quality assurance program*

The laboratory shall establish and maintain a documented quality system that is appropriate to the testing activities.

3.2. *Personnel*

Laboratory personnel shall have the education, training and experience commensurate with the examination and testimony provided.

The technical manager or leader, and examiner/analyst(s) must stay abreast of developments within the field of DNA typing by reading current scientific literature and by attending seminars, courses, professional meetings or documented training sessions/classes in relevant subject areas at least once a year. Training courses in Latin America are organized by the Latin American Society for Forensic Genetics.

3.3. *Facilities*

The laboratory shall have a facility that is designed to provide adequate security and minimize contamination.

3.4. *Sample control*

The laboratory shall have and follow a documented sample inventory control system.

3.5. *Validation*

The laboratory shall use validated methods and procedures for DNA analyses. The procedure shall be tested using known samples. The laboratory shall monitor and document the reproducibility and precision of the procedure using human DNA control(s).