Advanced Topics in STR DNA Analysis

STR Biology, Markers, and Methods

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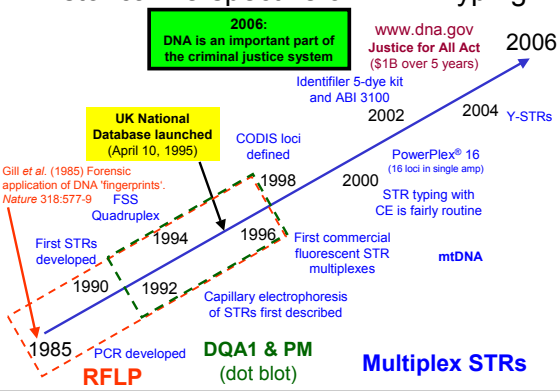
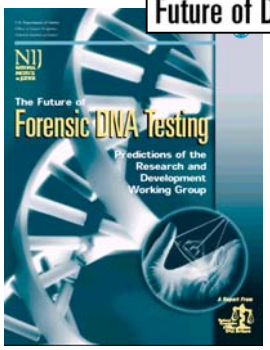
Outline of This Section

- Timeline of field and growth of STR use
- STR characteristics and biology
- STR core loci and commonly used kits
- miniSTRs
- STR protocols
- Reduced volume reactions
- STRBase resources

Historical Perspective on DNA Typing



National Commission on the Future of DNA Evidence



http://www.ojp.usdoj.gov/nij/pubs-sum/183697.htm

- Report published in Nov 2000
- Asked to estimate where DNA testing would be 2, 5, and 10 years into the future

Conclusions

STR typing is here to stay for a few years because of DNA databases that have grown to contain millions of profiles

National DNA Index System (NDIS)

FBI LABORATORY

CODIS
COMBINED DNA INDEX SYSTEM

http://www.fbi.gov/hq/lab/codis/index1.htm

Combined DNA Index System (CODIS)

Launched in October 1998 and now links all 50 states
Used for linking serial crimes and unsolved cases with repeat offenders
Convicted offender and forensic case samples along with a missing persons index
Requires 13 core STR markers
>27,000 investigations aided nationwide as of Sept 2005
Contains more than 2.8 million DNA profiles

Advantages for STR Markers

- Small product sizes are generally compatible with degraded DNA and PCR enables recovery of information from small amounts of material
- Multiplex amplification with fluorescence detection enables high power of discrimination in a single test
- Commercially available in an easy to use kit format
- Uniform set of core STR loci provide capability for national and international sharing of criminal DNA profiles