



Interagency Workshop on Next Generation DNA Sequencing

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Defense Biometrics and Forensics Office

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DNA Sequencing Workshop Objectives



- **Review current DNA sequencing technology and possible forensic and human ID applications**
 - Establish a common starting point for further discussions and planning within the Government forensic community

- **Share information about active Government efforts in this area**

- **Begin to outline possible cooperative strategies for establishing programs to accelerate progress toward core applications**
 - Identify common ground among organizations
 - Application interests
 - Priorities
 - Concerns
 - Discuss possible next steps
 - Formation of a Steering Committee
 - Formation of subcommittees/working groups for technology and policy



Rapid DNA Equipment Development: Successful Cooperative Model

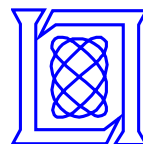


- Interagency consensus:
Combine DoD, DOJ, DHS efforts to create unprecedented common core rapid DNA analysis instruments
- Coalition that formed in 2009 has enabled accelerated development of prototype systems
- Cooperative approaches are desired path forward

ANDE Steering Committee



ANDE Technical Advisors





Notional path Forward

Today



Fieldable Rapid DNA Profiling Equipment

1st Gen Rapid STR Analysis Prototypes

- Fully Automated
- Non-lab environment

Future developments extend applications, accelerate, miniaturize

Advanced Human DNA ID Applications

State-of-the-art DNA analysis methods with increased information content

- Scientific foundations
- Method development
- Lab/data infrastructure
- Policy/standards

Next-Gen Field ID

Advanced Human DNA analysis near point-of-need

- Automation
- Instrument suitability
- Logistics



Vision: Sequencing For Forensic Applications



Potential Benefits

- Increase capacity and reduce cost for DNA ID
 - Multiplexed sequencing for increased throughput
 - STR, Y-STR, mtDNA, SNP in one test
- Make DNA identification more capable
 - Enhanced kinship data, beyond parent-child
 - Assess potential for future FDP and activity profiling
- Make DNA identification more secure
 - Maximize resistance to evidence tampering

Approach

- Establish scientific foundation
 - Ensure backwards compatibility with existing ID databases
 - Population studies to establish validity of new analyses
- Enable forensic uses of sequencing technology
 - Touch sample sensitivity
 - Mixture analysis
- Track and benchmark performance of multiple systems

Strategy

- Leverage ongoing technology investments
 - Industry competition driving cost / throughput improvements
 - Some USG programs already funding fieldable sequencers
- Seek coordinated investment in foundational science to foster inter-agency effort
 - Larger effort than one agency likely to tackle
 - Identify and prioritize overlapping needs
 - ANDE Program as cooperative model