Arizona Department of Public Safety
Crime Laboratory

Rapid DNA Initiative: Implementing a Law Enforcement Program and Statewide Arrestee Program

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Arizona Rapid DNA Program History

- June 2013 – Purchased first RapidHit 200
- May 2014 – Initiated the Rapid DNA Officer Training Program
  - Expanded to include Crime Scene Technicians in 2016
- 2016/2017 – Pilot study for analysis of Arrestee and Offender samples
Rapid DNA Officer Program

Objectives

- Provide Investigative Leads to Law Enforcement from forensic samples
- Identification of Victims
- Identification of apprehended individuals (comparison to forensic unknowns)
Rapid DNA Officer Program

Sample Scope

- Only presumed single source samples
  - Blood
  - Saliva
  - Semen
- Must be enough sample for follow up analysis in the lab
Rapid DNA Officer Program

Training

- 10 officers
- 2 RH200 Instruments
- Five day training class
- Arizona DPS will share its training materials with any agency starting a similar program
Rapid DNA Officer Program
Training - Performance Objectives

At the completion of this course the student will demonstrate:

- An understanding of basic biology
- An understanding of basic DNA analysis
- An understanding of identification of appropriate samples for analysis on the RapidHit 200 instrument
Arizona DNA Database Network

- IntegenX RapidHit 200’s in two AZDPS locations
  - Colocated with Phoenix and Tucson Laboratories
  - Accessible to certified Rapid Operators
- Connected to the AZ DB secure, closed network
- SmallPond software housing the AZ DB
  - Synchronized with AZ SDIS
RapidHit 200 Instrument
# Ponds

**Knowns**

- This pond holds statewide knowns.
- Processed Profiles: 522,041
- Unprocessed Profiles: 0
- Comparisons: 136,263,141,820
- Matches: 0

**Suspects**

- This pond holds statewide suspect profiles.
- Processed Profiles: 10,028
- Unprocessed Profiles: 0
- Comparisons: 50,275,378
- Matches: 0

**Rapid DNA**

- This pond holds Rapid DNA samples.
- Processed Profiles: 0
- Unprocessed Profiles: 0
- Comparisons: 0
- Matches: 0
## Match Detail

### Match Statistics

<table>
<thead>
<tr>
<th></th>
<th>Searched Profile</th>
<th>Matched Profile</th>
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</thead>
<tbody>
<tr>
<td>Pond Name:</td>
<td>Rapid DNA</td>
<td>Rapid DNA</td>
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<tr>
<td>Profile ID:</td>
<td>3065967</td>
<td>3064828</td>
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<tr>
<td>Specimen ID:</td>
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<td>9772e21f-0399-4df7-a2db-8ca93e822b7d</td>
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<tr>
<td>Specimen Source Known?</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Locus Data Partial?</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Is Mixture?</td>
<td>[ ]</td>
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### Locus Data:

<table>
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<td>TH01</td>
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<tr>
<td>D25135B</td>
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<td>16,17</td>
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<td>FGA</td>
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<td>22,25</td>
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<td>TPOX</td>
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<td>D8S1179</td>
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<td>15</td>
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<tr>
<td>vWA</td>
<td>17,19</td>
<td>17,19</td>
</tr>
<tr>
<td>AMELOGENIN (AMEL)</td>
<td>X,Y</td>
<td>X,Y</td>
</tr>
<tr>
<td>Penta D</td>
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<td>D165539</td>
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Random Match Probability: 1 in 1,539,608,203,632,830,000,000,000,000,000
## Arizona DNA Identification System Specimen Lookup

<table>
<thead>
<tr>
<th>First Name</th>
<th>Middle</th>
<th>Last Name</th>
<th>Gender</th>
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<tr>
<th>DOB</th>
<th>SSN</th>
<th>SID</th>
<th>Race</th>
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Back to the Search Page
The Arizona DPS Rapid DNA Program Cases to Date

- Two locations: Phoenix and Tucson
- Approaching 300 Cases run
- Approximately 30% hit rate
- Profiles from RAPID have been concordance checked by 4 DNA labs in AZ
The Arizona DPS Rapid DNA Program

- Types of Cases
  - Break and Enter Sex Assault
  - Aggravated Assault (OIS)
  - Bank Robbery
  - Child Molestation
Rapid DNA Arrestee Program

The “Challenge”: Provide an immediate analysis and CODIS upload of Arrestee samples to law enforcement agencies statewide.
Why a Laboratory Rapid DNA Arrestee Program?

- Approval for Booking Stations
  - Waiting since 2013
  - Program could take years to implement after approval
  - A laboratory solution probably less expensive
Why a Laboratory Rapid DNA Arrestee Program?

- Lab vs. Booking Stations
  - Fewer sites/instruments needed
  - 15 County Booking Stations plus Larger Municipalities vs. Four Laboratories
  - All law enforcement agencies within approximately two hours of a laboratory
Why a Laboratory Rapid DNA Arrestee Program?

- Lab vs. Booking Stations
  - Laboratory Technicians vs. Detention Officers
    - Learning curve much less steep
    - Fewer personnel to train
    - Better expertise support (forensic scientists)
    - Duplicate check more reliable
Current Workflow

- Sample Check-in & Data Entry
- Scan Database Card
- Assign samples to a plate
- Punch on BSD 600
- Direct Amplification using GFE
Current Workflow

- CE Run
- Primary Analysis
- Secondary Analysis/Technical Review
- CODIS Upload
- Administrative Review
New Arrestee Workflow

- Sample Check-in & Data Entry
  - Automate Some Data Entry
- Scan Database Card
- Assign Sample to a Plate
- Add Swab to Well
RapidHit 200 Cartridges
RapidHit 200 Cartridges

CONTROL CARTRIDGE

- 3 samples
- 1 allelic ladder
- Reagent reservoirs
- PCR premix
- Reaction chambers
New Arrestee Workflow

- Rapid Run
- Primary Analysis
- Secondary Analysis/Technical Review
- CODIS Upload
- Administrative Review
Current Challenges

- New Collection Kit
- Check-in Backlog
- Pullup and Minus A
- STaCS Integration
Current Kit
New Arrestee Collection Kit

- Add a swab to our current kit and use the Bode 2 collector
Program Rollout

- Identify a partner agency
  - Training for new kit
  - Continuous Improvement
- Expand Statewide
The Arizona DPS Rapid DNA Program

Acknowledgements

- Mark Smith, DNA Database Unit Supervisor
- Scott Rex, Laboratory Manager
- Jennifer Kochanski, Laboratory Manager
- Dave Duplissa, DNA Database Technical Leader
- Lt. Col. Timothy Chung, Assistant Director DPS
- DNA Database Unit