

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



SmallPond™

DNA Profile Matching System



AZ Department of Public Safety

Welcome, Vince Figarelli ▾

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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

Case Detail

Case

Name:

Church Breaking and Entering

Description:

Criminal Offense:

14-54. Breaking or entering buildings ▾

Is the case open?

Yes No

Users

	Name	E-mail
<input checked="" type="checkbox"/>	Figarelli, Vince	vfigarelli@azdps.gov

Show: All | Checked | Unchecked

Save

Add Specimen

	Specimen Id	Hit Status	Evidence Type	Description	Collection Date	Lab Entry Date	Match Date
	2014-05-03	Collected	Blood, Evidence (Drop)	Unknown	05/02/2014		

Items per page: 20 ▾



Match Detail

Match Statistics

Random Match Probability: 1 in 1,539,608,203,632,830,000,000,000,000

	Searched Profile	Matched Profile
Pond Name:	Rapid DNA	Rapid DNA
Profile ID:	3065967	3064828
Specimen ID:	2014-05-02-0001	97f2fe2f-0399-4df7-a2db-8ca93a822b7d
Category:	Unknown	Unknown
Specimen Source Known?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Locus Data Partial?	<input type="checkbox"/>	<input type="checkbox"/>
Is Mixture?	<input type="checkbox"/>	<input type="checkbox"/>
Locus Data:		
Penta E	13,17.4	13,17.4
D18S51	16,18	16,18
D21S11	28,34.2	28,34.2
TH01	7,8	7,8
D3S1358	16,17	16,17
FGA	22,25	22,25
TPOX	8,9	8,9
D8S1179	15	15
vWA	17,19	17,19
AMELOGENIN (AMEL)	X,Y	X,Y
Penta D	1.2,11.1	1.2,11.1
CSF1PO	7,12	7,12
D16S539	11,14	11,14
D7S820	8,11	8,11
D13S317	13	13
D5S818	11,13	11,13
D2S1338	23	23
D19S433	12,14	12,14

FOR LAW ENFORCEMENT USE ONLY

A.R.S. 13-610 Section I



Arizona DNA Identification System Specimen Lookup

Specimen ID: [REDACTED]

First Name	Middle	Last Name	Gender
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

DOB	SSN	SID	Race
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

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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

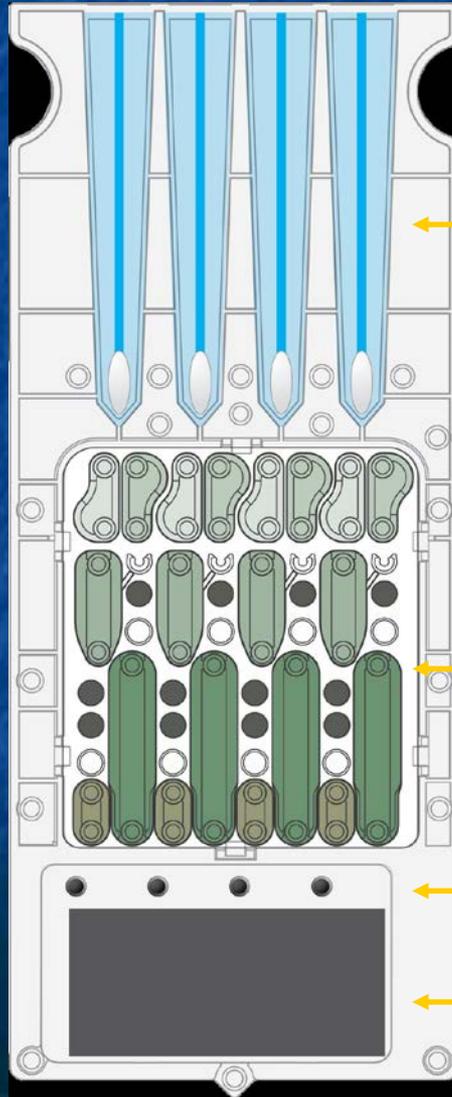
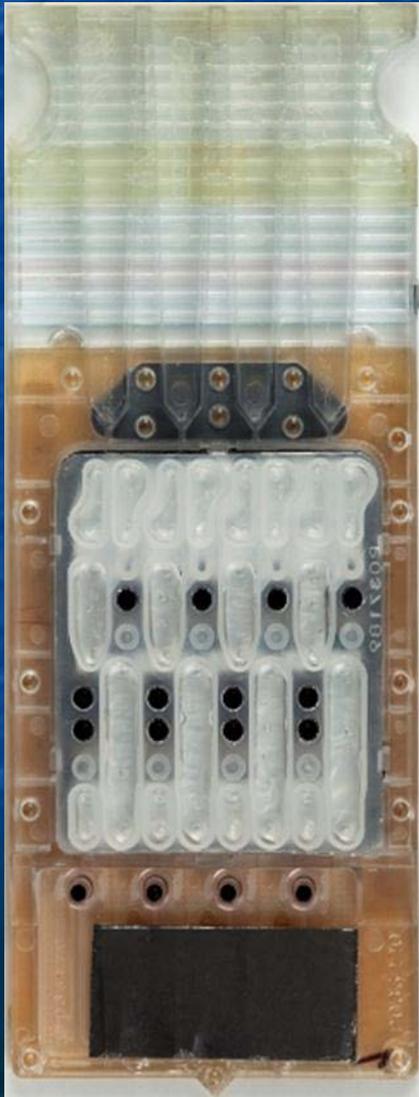
New Arrestee Workflow

- 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

RapidHit 200 Instrument



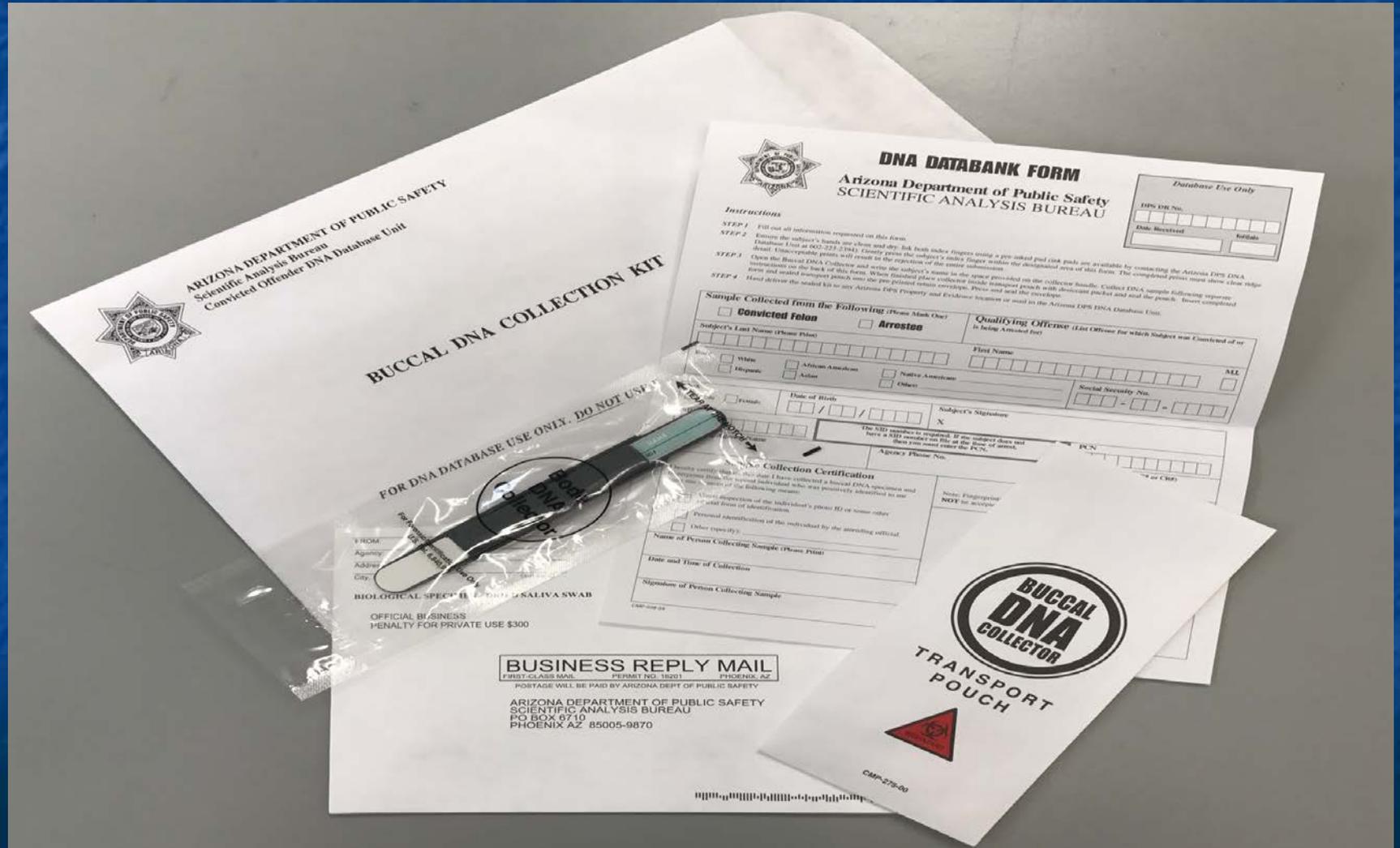
New Arrestee Workflow

- 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



ARRESTEE

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
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- DNA Database Unit