Rapid DNA Results in 90 Minutes, Safer Communities

IntegenX Technology Update
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IntegenX Technology Update

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250+ instruments in 40+ countries

- Forensic Science
- Law Enforcement
- Military and Intelligence

Serving customers across the globe in multiple sectors
The only Rapid DNA uploaded to both CODIS and NDNAD

May 2015: Arizona Department of Public Safety is first NDIS lab to upload DNA profiles to national database utilizing Rapid DNA

Aug 2015: Profile uploaded to UK NDNAD identifies dangerous sex offender while suspect in custody, with >1,000 samples since 2014
IntegenX Technology Update Objectives

Share our vision of Rapid DNA

Partner with leaders in forensics DNA to make Rapid DNA a reality in the United States

Receive your feedback
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Arrestee Testing
Casework in Forensic Labs
Victim Identification
Mobile DNA Labs
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Arrestee Testing

Casework in Forensic Labs

Victim Identification

Mobile DNA Labs
Extract, amp and generate profiles on a single instrument

Sample Cartridge

Put sample into lysis chamber → Lyse sample → Solid phase capture

Add ILS to STR products & mix → Amplify → Add STR reagents

Transfer STR/ILS to electrophoresis

Fill capillary with gel → Inject STR/ILS mixture → CE and detect

Analyse and upload results

Primary Cartridge

1. NDIS approved chemistry
2. NDIS approved software

RapidHIT ID

Confidential and Proprietary, IntegenX Inc.
Instrument designed with data integrity in mind

- Sample cartridge port
- Camera / barcode reader
- Large high-res display
- Single-piece glass face
- Fingerprint reader
- Microphone
- Sleep-awake
- Speaker
- USB
Ultimately link booking stations together with RapidLINK

Control over the data generated by RapidHIT instruments in booking stations
Link forensic labs together with RapidLINK

Centralized oversight over the data quality and performance of the system
RAPID: Richland Assesses Potential of near Instant DNA testing
RAPID Trial system setup

- Primary endpoint: time to results
- DNA collection in parallel to regular databanking process
  - State sample continues to CODIS
  - RAPID sample de-identified, time-to-result recorded

*Can use existing infrastructure to demonstrate improved time-to-results*
Rapid DNA arrestee testing setup in practice

BOOKING STATION 1

BOOKING STATION 2

MOBILE LAB

FORENSIC LAB

USB Mobile Data (4G LTE) VPN

VPN server

VPN server

VPN server

LAN

Internet

Database server

RapidLINK

+100 database samples, 89% success rate, within the first four months of operation
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Arrestee Testing

Casework In Forensic Labs

Victim Identification

Mobile DNA Labs
Single-use cartridges with economies of scale in mind

Sample-to-CODIS
- Buccal swabs

Extracted DNA in a lab
- Blood stains
- Cigarette butt
- Swab of a cup lip
- Swab of a gun
Reduce analyst workload with hands-off DNA analysis

Collect sample → Extract and quantify DNA → 90 Minutes → Interpret STR results
Sensitivity comparable with conventional systems

Generate a profile with as little as 150 picograms
Feb 2017: Extracts from a motor vehicle theft (still unsolved) and forcible rape (solved) were analyzed using the RapidHIT ID and EXT Sample Cartridge resulting in suspect full profiles, subsequently uploaded to CODIS/SDIS.
Discover flexible capacity to accommodate one-off samples

RapidHIT makes it easy to run a mid-week rush case quickly
RapidHIT System

- Up to 8 samples in one run
- 1-, 3-, 4-samples per cartridge
- Two cartridges per run
- Multiple sample types and run conditions published in peer-reviewed papers
Sample cartridge with major parts labeled

- EEPROM
- Pneumatic ports for MOVE valves
- Samples
- Frame
- Wash solutions
- Beads
- Lysis solution/waste
- Internal lane standard
- PCR mix
- Reaction chamber
Sample types run on RapidHIT

Blood

Saliva

Semen,
Hair,
Tissue,
Bone
Trace DNA on the outside packaging of counterfeit drugs

- Singapore law enforcement and drug regulatory agencies to target drug trafficking
- Law enforcement swab for trace DNA left on the outside of drug bags
- High sensitivity of EXT cartridges ideal for such cases
Victim-suspect matching in sexual-assault cases in India

- Emerging DNA databank
- Relieves pressure from a high visibility, politically charged social issue
- State-level support to use an evidence-based approach to deter future sexual assault offenses
Arizona Dept of Public Safety catches bank robber

- Male suspect videotaped wearing glasses and hat during bank robbery
- Swab from sunglasses left at the scene was analyzed
- Yielded investigative lead match to convicted offender
+30 Instruments placed throughout China

- Largest DNA databank in the world
- Casework backlog despite excess capacity in high throughput equipment and labor oversupply
- Mobile labs create a network of DNA analysis capabilities accessible to rural locations
Rapid DNA leads to rapid conviction

Mar 9: Suspect forced passenger out of an idling car, fled the scene, abandoned the car two miles away. Police submitted used cigarette for forensic analysis

Mar 15: Investigators matched sample to DNA profile in the local database

Mar 22: Suspect arrested

Apr 27: Gary Munoz, 30, Orange, plead guilty on April 27, 2017 to one felony count of carjacking

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Arrestee Testing

Casework in Forensic Labs

Victim Identification

Mobile DNA Labs
Victim identification in the Oakland Ghost Ship Disaster

- 36 Victims - All victims identified by the Alameda County Sheriff's Office's Coroner's Bureau
- Identifications made by fingerprint, dentition, and body markings
- Upon request, DNA testing performed on four victims
  - CAL DOJ performed confirmatory DNA testing on the four victims using traditional/validated DNA procedures
  - The Alameda County Sheriff's Office's Forensic Biology Unit performed RapidHIT ID testing
    - RapidHIT ID is not validated for casework
    - RapidHIT ID results
      - 4 of 4 oral swabs from the victims
      - 3 of 4 toothbrushes used as a reference for the victims
Participated in FEMA disaster exercises
Nearly-full profile produced from burnt body in Panama

- Victim’s body discovered in burnt home
- Sample taken from crude clavicle bone extraction (no decalcification step) was applied to a swab and processed in the RapidHIT ID
- 20 of 24 loci identified
- Enabled kinship comparison to victim’s brother
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Casework in Forensic Labs

Victim Identification

Mobile DNA Labs
The Netherlands: Mobile Crime Investigations

1. Smoke sample
2. Analyze smoke sample
3. Determine if shifted

Yes/No
Mobile vans with RapidHIT – The Netherlands

- Provide regular service to a larger geographic territory
- Access remote regions
- Being processing on-site; results may be available before arrival at next scene

Ideal for management of emergencies and disasters
Mobile vans with RapidHIT – China
Mobile vans with RapidHIT – Panama

Customer’s Mobile Forensics Lab, in which he wants to place RapidHIT ID
Easy installation, results in less than 30 hours

RapidHIT ID installation

RapidLINK integration

Blood on suspect’s knife matched victim’s reference sample
Increase the impact of Forensic DNA with RapidHIT

Remote forensic review, notifications
Trusted by Global Customers in +40 Countries
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