

Innovative Device to Decrease Sexual Assault DNA

Men, women, and children are all impacted by sexual violence; in America an incident of sexual assault occurs approximately every 98 seconds. Sexual assault cases contribute ~52% of the samples processed by forensic DNA labs. Every year sexual assault cases remain unprocessed and accumulate in number due to the extensive manual processing times required for these samples. Microfluidic devices (micro-devices) have been developed incorporating common laboratory approaches; these devices present an option for optimization of the processing time of these unique forensic samples.

The technology

Researchers at Virginia Commonwealth University have developed an integrated micro-device that is able to process complex, compromised forensic case samples, separate sperm cells from epithelial cells, liberate DNA from the cells, and simultaneously amplify the DNA using polymerase chain reaction (PCR) in the same device. With these functions occurring within one unit utilizing rapid hardware technologies, the time required to process a sample is diminished, which allows labs to shift labor downstream to data analysis. Additionally, this micro-device functions within a standard forensic lab workflow.

	Traditional	S.A. Microdevice
Instrument Cost	\$9,000	\$1,600
Cost/Sample*	\$2.54	\$1.85
Hands-on time	2.5-3.5 hr	15-20 min
Total Time	5-6.5 hr	1.5-2 hr

*Approximate

Table 1. The decrease in time and cost with this new technology.

Benefits

- » Sample processing time end costs diminished
- » Increased amount of examiner time available for data analysis
- » Functions within traditional forensic lab workflow
- » Minimal validation requirements

Applications

- » Integrated micro-device processing of complex, compromised samples
- » Separation of sperm cells from epithelial cells
- » DNA liberation and PCR amplification

Patent status:

Patent issued: U.S. rights are available. 16/484,142

License status:

This technology is available for licensing to industry for further development and commercialization.

Category:

Biomedical
Engineering and Physical Science

VCU Tech #:

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In vitro data available

Contact us about this technology

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