Fingerprint Analysis to Determine Link to Explosives, Drug Use

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Fingerprints have been used to identify individuals for more than a century, [1] but now at least one law enforcement agency is utilizing a new fingerprint technology that could make identification easier. Traditionally, fingerprints are analyzed and compared to known individuals to determine a match. Fingerprints, however, also leave behind residue that can contain information specific to an individual.

ArroGen, a North Carolina based company, developed the Fingerprint Molecular Identification (FMID) technology, which creates a molecular profile based on fingerprint analysis. [2] The company touts the technology can determine a slew of information about the person who left the fingerprint, including gender; use of drugs, medicine or tobacco; and exposure to explosives. [3]

"FMID will give investigators, prosecutors and government agencies a powerful new tool for human identification," said ArroGen Chief Executive Officer Michael Heffernan. "This unprecedented technology will empower their investigations and intelligence-gathering with indisputable scientific evidence, saving time and money." [3]

ArroGen’s technology uses silica-based powders and mass spectrometry to capture and analyze chemical residues left on fingerprints. [4] The powder is sprinkled on the fingerprints and then the prints are lifted using lift tape. [5] Particles in the powder bind to amino and fatty acids in the fingerprints. [6] The samples are analyzed in a mass spectrometer, which vaporizes and ionizes the powder particles and fingerprint residue molecules to detect molecular profiles. [5] These molecular profiles can detect drugs including cocaine, heroin, marijuana, methamphetamines and other traditional medications. [4]

"The engineered particle powders provide higher contrast and clarity when developing latent fingerprints and allow for the collection of molecular information when coupled with mass spectrometry," said Kim Sandquist, chief science officer of chemistry at ArroGen. [5]

ArroGen’s technology is available in kits, which would allow independent testing. [2] Kits to determine nicotine and drug use are available now and the company expects kits to determine gender and explosive applications available in early 2016. [2]

The ability to test fingerprints for traces of drugs, explosives or gender could be of critical use for law enforcement and military use. If it is possible to detect explosives via fingerprints, it may be easier to identify terrorists.

"We’ve increased very significantly the amount of data that can be taken from a crime scene to help support law enforcement’s hypothesis about how a crime occurred or did not occur," said Mark Dale, ArroGen’s Chief Operations Officer. “There’s a billion airline passengers a year who go through security. The technology could be used to screen those individuals for explosives, and piolets for any type of controlled substances or substances that could cause impairment." [5]

And, information could be retrieved from fingerprints and collected in a database for future use.

images of identifying marks to be uploaded and searched. [7]

References:

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