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Israeli scientist says DNA samples can easily be forged

Dr. Frumkin's research raises serious questions about validity of forensic tools in identifying criminals.

By Ofri Ilani | Aug.20, 2009 | 2:06 AM

In recent years, DNA has become one of the police's most basic forensic tools for identifying criminals. A DNA sample from blood or saliva found at a crime scene is considered particularly strong legal evidence, perhaps the strongest available. However, an Israeli scientist is now saying that it is much easier to fabricate DNA than was previously thought.

With the aid of simple equipment obtainable on the open market, Dr. Dan Frumkin and his colleagues were able to produce blood samples with faked DNA that passed genetic testing without notice. The study raises serious questions about the validity of these tests.

"It is only a matter of time before criminals start producing bogus DNA," says Frumkin, one of the founders of the Nucleix company in Tel Aviv, developers of technology to identify forged DNA. Frumkin does not discount the possibility that such fabrications have already taken place. "What is certain is that low-cost equipment needed to reproduce DNA already exists. The most basic knowledge of an undergraduate biology major is enough to operate it."

In order to plant DNA at a crime scene and manipulate the results of genetic testing, sufficient quantities of saliva or blood with the fabricated DNA of the person to be incriminated would have to be scattered. "If you have a natural source - even one cigarette butt, a hair or a bottle of water [used by that person] - you can produce only a tiny amount of DNA. But this amount can be reproduced and increased, and mixed with someone else's real blood. The genetic profile will be that of the manipulated, false DNA," says Frumkin.

In the study by Frumkin and his associates which appears in the online journal *Forensic Science International: Genetics*, they forged DNA via simple means. "We took blood from a female volunteer and separated the red cells, white cells and plasma, the way all labs do. We then added DNA taken from a male volunteer to her red cells [which do not contain DNA], creating faked blood containing only the man's DNA, and lacking the DNA of the original donor."

The researchers then checked to see if the fabrication would be detected by experts in genetic identification. "We sent the sample to a well-known lab that works for the FBI. We asked for a profile, and the result was a profile of the faked DNA."

According to Frumkin, it is possible to forge a person's DNA without even obtaining his or her body fluids, rather by simply knowing their genetic profile, the kind stored in police databases. "A genetic profile is a string of 26 numbers," Frumkin says. "If you get your hands on the numbers in the string, you can fabricate DNA."

Even if law enforcement personnel use equipment in order to identify forged DNA, criminals have another option: to plant the genuine DNA of a person they want to incriminate. But in most cases, they won't be able to obtain a large enough amount of real DNA. "If you plant a single hair at the scene of a crime, the police probably won't find it," Frumkin notes.

Criminal investigation experts emphasize that DNA samples are not the only evidence gathered. "This is evidence whose authority has increased because testing has become more precise. But we don't rely solely on DNA in most cases," according to retired police superintendent Lior Nadiivi. "If we find someone's DNA at a crime scene, he has to explain how it got there. If he has an alibi and does not have a criminal record, we won't indict him on the basis of DNA. If police are stupid enough to fall for this kind of proof, that's their problem, and not a problem with the evidence."

Dr. Yoram Plotsky, an attorney and genetic identification expert, maintains that the study's findings do not rule out use of DNA evidence. "There are dozens of instances of mistaken DNA identity. There are more than a few cases where someone has been located via the database and turned out to be the totally wrong person. The method is problematic, statistically and otherwise - but I don't believe that the danger of fabrication is the main danger, because it takes a lot of knowledge to carry it out."