

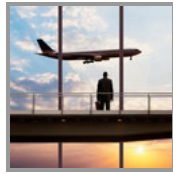
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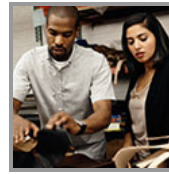
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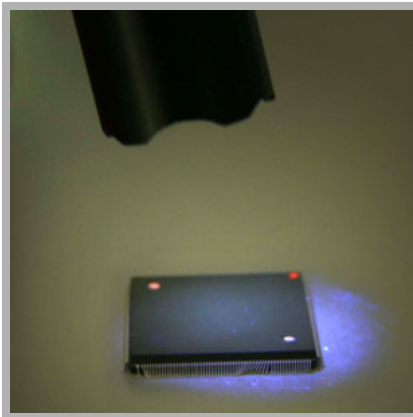
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Plant DNA: The New Tool to Thwart Military Counterfeiters

Counterfeit parts made in China have been slipping into the U.S. military's machinery. One company has a clever DNA-based plan to stop it.

By Eric Tegler



July 24, 2014 8:00 PM

TEXT SIZE: A . A . A

A New York-based company has developed a nearly foolproof way to distinguish genuine parts and components from counterfeit copies—by marking them with plant DNA.

"The DNA is the forensic backstop," says Judy Murrah, CIO of Applied DNA Sciences. "It's an absolutely uncopiable and unique identification."

Five years ago, as [Applied DNA Sciences](#) began this work applying biotechnology to secure supply chains and aid law enforcement, the U.S. military had a problem: Media reports surfaced of counterfeit electronic parts from microchips to sensors showing up in the U.S. military supply chain. A 2011 government probe found a majority of the electronic components that went into aircraft from the multi-service C-130 cargo-hauler to the Navy's new P-8A maritime patrol aircraft actually originated in China. [The problem continues.](#)

To deal with the crisis, [the Senate](#) approved an amendment in 2012 that requires large defense contractors to establish systems for detecting and avoiding counterfeit parts. The U.S. Defense Logistics Agency (DLA) cast around for ways to tag and authenticate the bits and pieces in the military supply chain and found Applied DNA Sciences' DNA-marking technology.

The company's SigNature DNA marker is based on full, stable double-stranded plant DNA sourced from its own store of biological material. The company engineers plant DNA strands into a unique mark, which cannot be decoded using the conventional process to sequence DNA. The mark is then applied or tagged to a component.

Applied DNA Sciences says that an essentially infinite number of custom DNA sequences can be created and embedded into a range of host carriers, such as ink, varnish, thread, laminates, and metal coatings. James A. Hayward, Applied DNA Sciences' CEO, says the base DNA material itself can provide strands for an extremely high number of markings.

"It's a very simple, nontoxic, naturally-occurring bit of DNA which is extraordinarily scaleable. We calculated that a typical quarter-pound hamburger has about 500 million times the dose we would need to mark a single prescription tablet."

Currently, 30 defense suppliers use SigNature DNA marking. A development contract Applied DNA Sciences recently signed with the U.S. Missile Defense Agency will expand that number to more than

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100 firms that manufacture components in high volumes. Applied DNA Sciences vice president Janice Meraglia says that each company will get a distinctive mark.



"That mark is specific either to a period of time or a specific facility at that company," she says. "One company might have four different facilities and may want four different marks for those locations, or they may want different marks for any given year. They'll always know where in their own production facilities and when that part was marked."

Applied DNA Sciences not only defines the marks but also provides suppliers and the military with an authentication process. For example, take a circuit board for a U.S. Air Force F-15 fighter that is shipped to Ramstein Air Base in Germany. Upon arrival, Air Force logistics officers would use a simple ultraviolet flashlight to determine if it has an authenticity marking. If they detect the marking, they then use a spectral reader to determine whether the marking is a SigNature DNA mark. A green light indicates the Applied DNA Sciences mark.

"If there's any question as to whether the part could be counterfeit," Murrah adds, "the mark could be swabbed and a DNA sample sent back to the Applied DNA labs for forensic analysis."

In future, the forensic tests will be carried out in the field, cultivating better security and more confidence in the military supply chain.

TAGS: [counterfeiting](#), [china](#), [dna](#), [military research](#), [plants](#)

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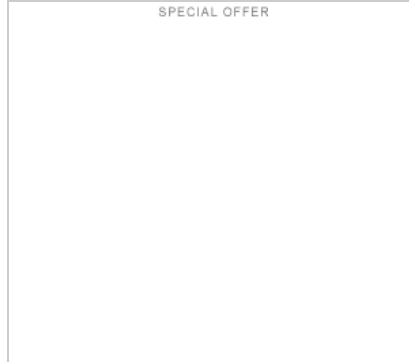
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