What NIST is doing to help

As the nation’s chemical measurements laboratory, NIST is developing new tools and methods to help public health and law enforcement agencies combat fentanyl and other synthetic drugs. Our efforts, part of NIST’s Forensic Science Research Program, are strategically focused on three areas where new technology can have the greatest impact.

1. Stopping fentanyl before it enters the country
2. Safe handling in the field and the lab
3. Rapid identification of new substances

More details on p. 2.
1. Stopping fentanyl before it enters the country

Most fentanyl used illegally in the U.S. originates in China and arrives directly in by international post and delivery services or overland via Mexico. NIST researchers have:

- Investigated new methods for high-throughput, hands-off screening of packages at postal inspection facilities.
- Tested chemical detection technologies for screening vehicles at border crossings.
- Developed an “artificial dog nose” that can boost the detection capabilities of chemical sensors.
- Developed new ways to safely train dogs to detect fentanyl and other substances without risk of exposure during training.

2. Safe handling in the field and the lab

Traditional evidence handling and drug testing methods pose a risk of accidental exposure via inhalation, which can be dangerous or deadly. NIST researchers have:

- Validated new methods for identifying the contents of suspicious packages without opening them, which reduces the risk of accidental exposure.
- Developed new laboratory workflows that separate hazardous substances for special handling, which speeds up workflow without compromising safety or reliability.
- Developed protocols for minimizing the spread of drug residues in laboratories. These residues increase the risk of workplace exposure and can compromise laboratory measurements.
- Published validation protocols so other labs can implement these solutions across the nation and at scale.

3. Rapid identification of new substances

New fentanyl variants, or analogues, can be far more potent and deadly than the original. They can also be difficult to detect and identify using traditional laboratory methods. NIST researchers are:

- Developing new software that can help forensic chemists identify novel fentanyl analogues.
- Adding new “molecular fingerprints” to chemical identification databases.
- Providing quality control for the SWGDRUG databases that forensic chemists use to identify novel substances.
- Built a global online platform where law enforcement and forensic chemists share data on new drug analogues.

NIST is developing these new methods in collaboration with law enforcement and forensic laboratories and is committed to helping agencies successfully integrate these solutions into their operations. NIST is also addressing measurement challenges of other emerging synthetic drugs such as cannabinoids and cathinones and of complex mixtures of synthetic opioids with cocaine, heroin and methamphetamine.

For more information, visit [www.NIST.gov/opioids](http://www.NIST.gov/opioids).