

# Fentanyl Detection Using an Agilent Resolve Handheld Raman Analyzer

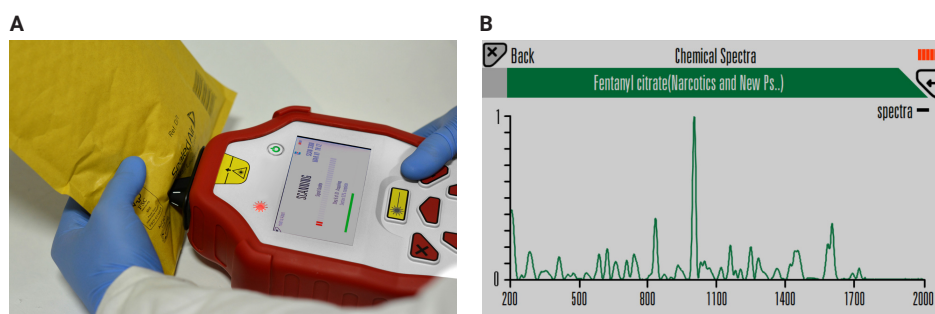
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## Safe identification of novel illicit opioids

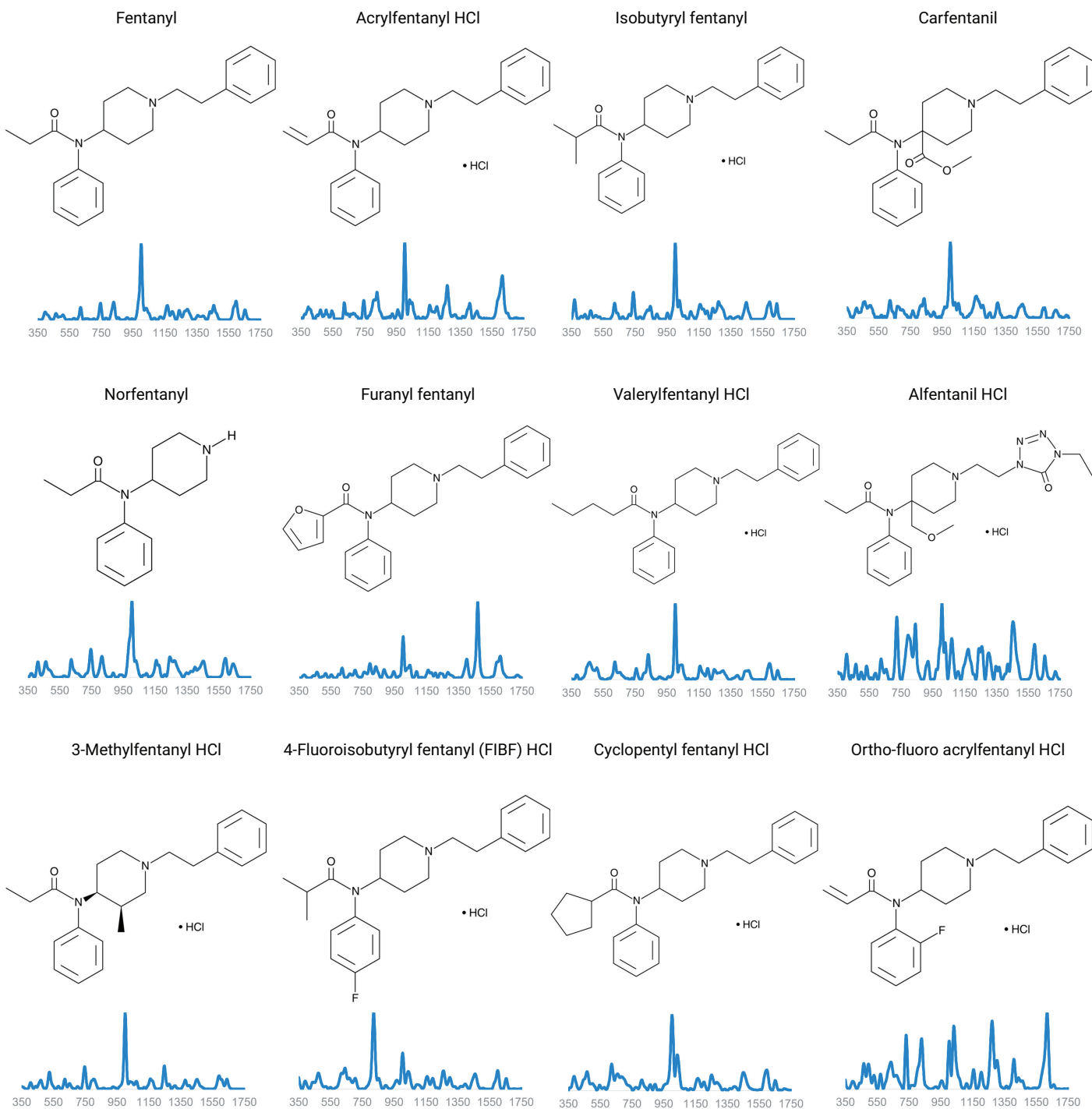
Fentanyl and fentanyl analogs are highly potent synthetic opioids that were developed in the 1950s as analgesics. These drugs are approved for clinical and veterinary use due to their rapid onset, potency (10 to 10,000 fold higher potency than morphine), and variety of administration methods.<sup>1</sup> However, these highly potent substances are increasingly found on the illicit drug market in North America<sup>2</sup>, where they have contributed significantly to the "opioid crisis" and to a high number of overdose-related deaths. Illicit fentanyls are available as powders, tablets, liquids, or skin patches, and have been found with other psychoactive substances, including heroin, cocaine, and methamphetamine.<sup>3</sup> All these material types present a high risk both in their pure form and after they have been prepared and packaged for sale.

The **Agilent Resolve handheld Raman analyzer** uses **spatially offset Raman spectroscopy (SORS)** technology to identify hazardous materials, explosives, and narcotics concealed behind single and multiple barriers. These barriers can include colored and opaque plastics, glass, paper, cardboard, wrapping, and fabrics. The combination of SORS, high data quality, low fluorescence interference, and a spectral library that is continuously updated with new psychoactive substances makes the Resolve a powerful tool in the detection and identification of controlled substances. As of library version 41, over 70 different fentanyls can be identified using Resolve.



**Figure 1.** (A) Agilent Resolve handheld Raman analyzer. (B) SORS spectrum of fentanyl citrate in the Narcotics and New Psychoactive Substances spectral library.

## Structures and Raman spectra of some fentanyl materials included in the Resolve library



## Fast, direct identification of narcotics

The Resolve handheld Raman analyzer with SORS and the "Narcotics and New Psychoactive Substances" spectral library can be used for the identification of narcotics in the original packaging. Direct analysis using the Resolve minimizes the risk of accidental exposure of law enforcers to the compounds.

## References

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2. Opioid Overdose Crisis: Time for a Radical Rethink. *The Lancet Public Health.* **2022**, *7*(3). DOI: [https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667\(22\)00043-3/fulltext](https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(22)00043-3/fulltext)
3. Center for Disease Control and Prevention, Stop Overdose. Fentanyl Facts. <https://www.cdc.gov/stop-overdose/caring/fentanyl-facts.html>

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