# Forensic Drug & Toxin Measurements

Material Measurement in Forensic Science

Need.

- To ensure the accuracy and reliability of forensic results and measurements
- To create improved methods in forensic analysis

Objectives

- Improving Analytical Capabilities in Three Forensic Science Program Areas
  - **Drugs and Toxins**
  - **Trace Evidence**
  - **Human Identity (DNA)**
- Develop measurement toolset
  - Methods, Reference Materials and Data for Forensics
- Enable quantifiable uncertainty of measurements
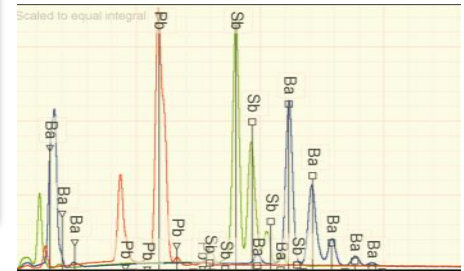- Improved efficiency/cost effectiveness
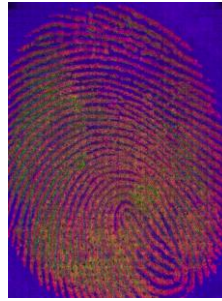
Combined Chemical and Biometric Analysis of Fingerprint Lifts
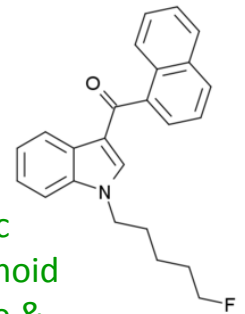
Synthetic Cannabinoid Structure & Analysis
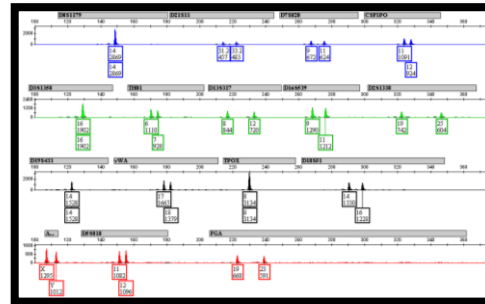
DNA profile generated 4X faster

Reliable ID of gunshot residue

Customers and Partners

SWGDRUG FBI DEA

life technologies

Promega

QIAGEN

NIJ National Institute of Justice

AFDIL Armed Forces DNA Identification Laboratory

ThermoFisher SCIENTIFIC

FORENSICS @ NIST   #NISTForensics
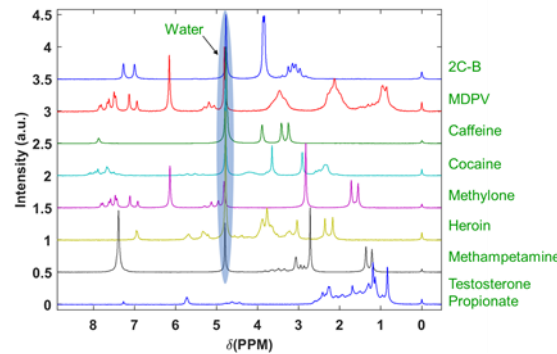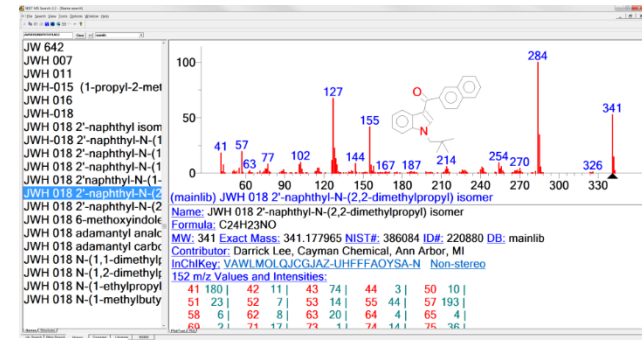
Drugs & Toxins

- ✓ Mass Spectrometry of Drugs
  - Improved reference data and approaches to uncertainty of identification
- ✓ NMR of Drugs
  - Develop approaches to reliable identification of drugs
  - Testing benchtop NMR
- Rapid Identification of Emerging Synthetic Drugs
  - Synthetic drugs are constantly changing and their structures must be measured
- ✓ Marijuana Breathalyzer
  - Growing decriminalization and legalization of marijuana
  - Need for a test for auto/truck driver **intoxication**
- Field screening approaches

SensAbues™ filter holder
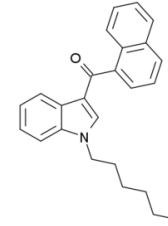
AM-2201, a synthetic cannabinoid

SWGDRUG   FBI   DEA

FORENSICS @ NIST   #NISTForensics

Strategy for Drugs & Toxins

- Develop measurement toolset
  - Methods, Reference Materials and Data for Forensics

- Enable quantifiable uncertainty of measurements

- Improve the efficiency/cost effectiveness

- Mass spectral database
- Field tests
- Inkjet materials (trace evidence talk)
- Possible Fentanyl analysis web resource

- For both qualitative and quantitative analysis

- Desktop & handheld technologies
- Reduced consumption of reference materials

ILLICIT DRUGS AND TOXINS

- 3:40 pm – 4:00 pm William Wallace
  - Gas Chromatography Mass Spectrometry (GC-MS) Libraries for the Identification of Controlled Substances

- 4:00 pm – 4:20 pm Tara Lovestead
  - A Better Understanding of Cannabis Chemistry to aid in Vapor Phase Detection

- 4:20 pm – 4:40 pm Aaron Urbas
  - NMR in Forensic Drug Analysis

- 4:40 pm – 4:50 pm Q&A SESSION