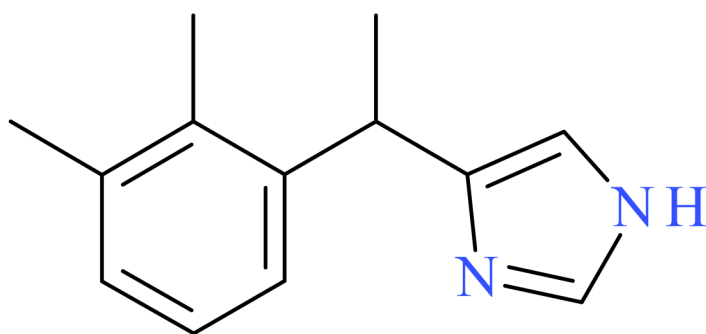




Medetomidine



NPS SUBCLASS
Miscellaneous
REPORT DATE
November 27, 2023
SAMPLE RECEIVED
August 23, 2023
SAMPLE TYPE
Toxicology

Preferred Name	Medetomidine
Synonyms	MPV 785, Dexmedetomidine (<i>specific enantiomer</i>)
Formal Name	4-[1-(2,3-dimethylphenyl)ethyl]-1H-imidazole
InChI Key	CUHVIMMYOGQXCV-UHFFFAOYSA-N
CAS Number	86347-15-1
Chemical Formula	C ₁₃ H ₁₆ N ₂
Molecular Weight	200.28
Molecular Ion [M ⁺]	200
Exact Mass [M+H] ⁺	201.1386

Characterization & Intelligence

The following information was compiled in November 2023 and is subject to change as new research is conducted and as new information becomes available:

Description: Medetomidine is an alpha-2 agonist, similar to clonidine and xylazine, that is used clinically as a sedative and analgesic. Medetomidine is categorized herein as an NPS due to its novelty in use as an adulterant in the recreational opioid supply, and is classified under our miscellaneous category. Medetomidine recently emerged in the fentanyl supply in the United States. Due to its uses clinically in humans, the presence of medetomidine in toxicology samples is not necessarily indicative of fentanyl adulteration and recreational use; administration in hospital should be ruled out on a case-by-case basis.

Sample Source: American College of Medical Toxicology (ACMT) — Toxicology Investigators Consortium

Sample Appearance: Blood, serum/plasma, and other toxicology specimens

Pharmacology: The pharmacology of medetomidine is extensively published in the literature.¹

Toxicology: Medetomidine has been detected in twelve toxicology cases at the CFSRE.

Drug Materials: Medetomidine has not been identified in drug materials to date at the CFSRE.

Demographics / Geographics: Toxicology specimens originated from the states of Missouri, Colorado, Pennsylvania, California, and Maryland. Medetomidine was commonly detected alongside fentanyl.

Legal Status: Medetomidine is not explicitly scheduled in the United States.

References:

- ▶ Cayman Chemical: [Medetomidine](#)
- ▶ ¹Vainio (1989) [Introduction to the clinical pharmacology of medetomidine](#)
- ▶ Sisco et al. (2023) [Identification of the veterinary sedative medetomidine in combination with opioids and xylazine in Maryland](#)

About: In collaboration with medical examiner and coroner offices, crime laboratories, clinical partners, and other stakeholders, the Center for Forensic Science Research and Education (CFSRE) is documenting first confirmations of NPS through analysis of drug materials and/or toxicology samples. These reports are generated using comprehensive analytical techniques (e.g., GC-MS, LC-QTOF-MS, NMR) and include available information about the new substances identified at the time of reporting, as well as the analytical data generated during testing. Our new drug monographs are intended to assist with the rapid identification of NPS in forensic casework and related disciplines, and should not be used for confirmatory purposes alone.

Analytical Notes: All identifications were made based on evaluation of analytical data (LC-QTOF-MS) in comparison to analysis of acquired reference material.

Acknowledgements: This report was prepared by Alex J. Krotulski, Alex Manini, Evan Schwarz, Sara E. Walton, Melissa F. Fogarty, and Barry K. Logan at the Center for Forensic Science Research and Education (CFSRE) at the Fredric Rieders Family Foundation. The authors acknowledge scientists at the CFSRE and NMS Labs for their involvements and contributions. For more information, contact npsdiscovery@cfsre.org or visit www.npsdiscovery.org.

Funding: CFSRE's NPS Discovery is supported by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice (Award Number 15PNIJ-22-CG-04434-MUMU, "Implementation of NPS Discovery – An Early Warning System for Novel Drug Intelligence, Surveillance, Monitoring, Response, and Forecasting using Drug Materials and Toxicology Populations in the US"). The opinions, findings, conclusions and/or recommendations expressed in this publication are those of the author(s) and do not necessarily represent the official position or policies of the U.S. Department of Justice.

Suggested Citation: Krotulski, AJ; Manini, A; Schwarz, E; Walton, SE; Fogarty, MF; Logan, BK. (2023) *Medetomidine* — *NPS Discovery New Drug Monograph*, Center for Forensic Science Research and Education, United States.

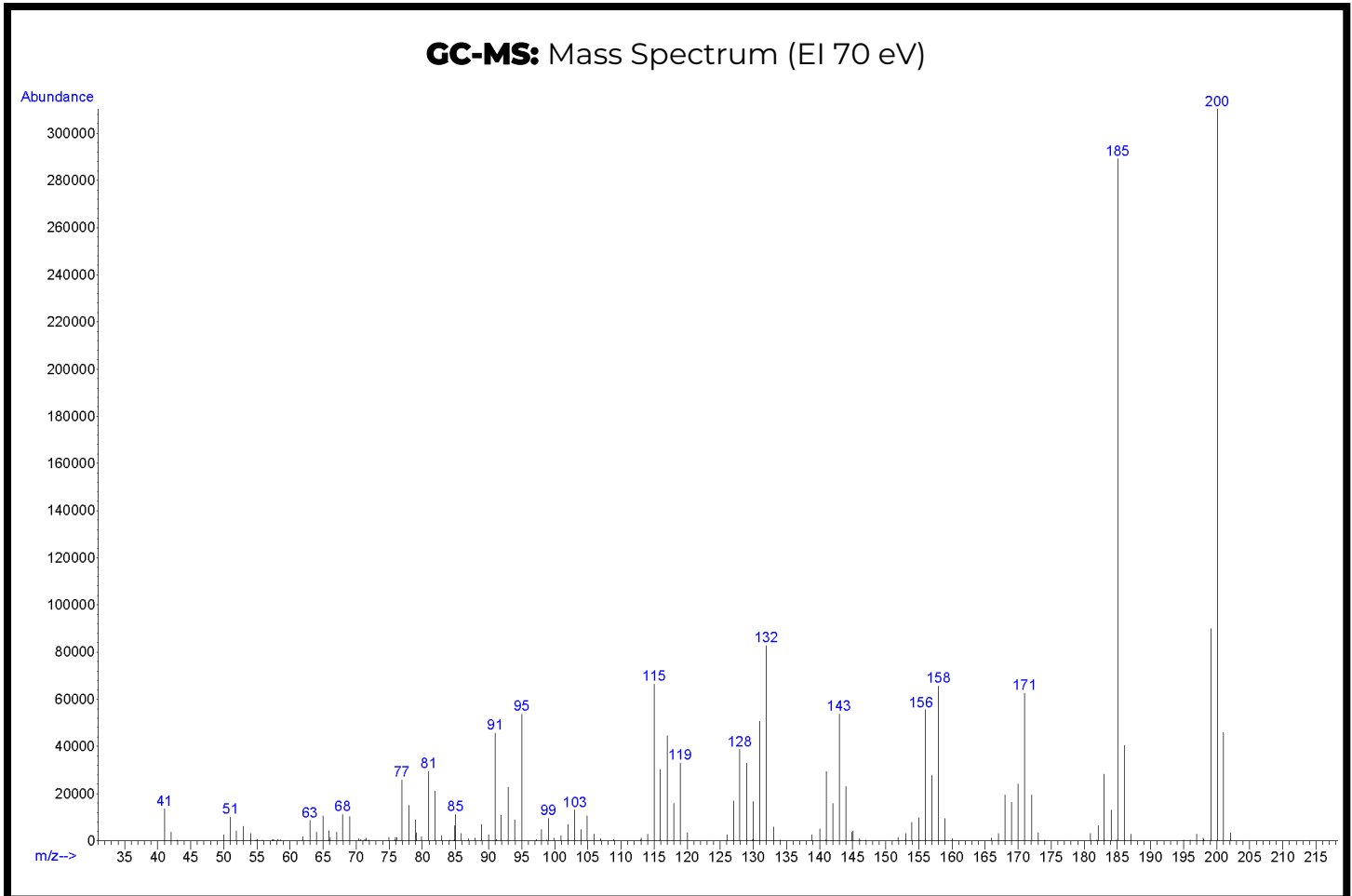
Gas Chromatography Mass Spectrometry (GC-MS)

Laboratory: Center for Forensic Science Research and Education (CFSRE, Willow Grove, PA, USA)

Instrument: Agilent 5975 Series GC/MSD

Methods: www.cfsre.org/nps-discovery/monographs
[GC-MS Method Details](#)

Sample Preparation: Standard diluted in methanol



Liquid Chromatography Quadrupole Time-of-Flight Mass Spectrometry (LC-QTOF-MS)

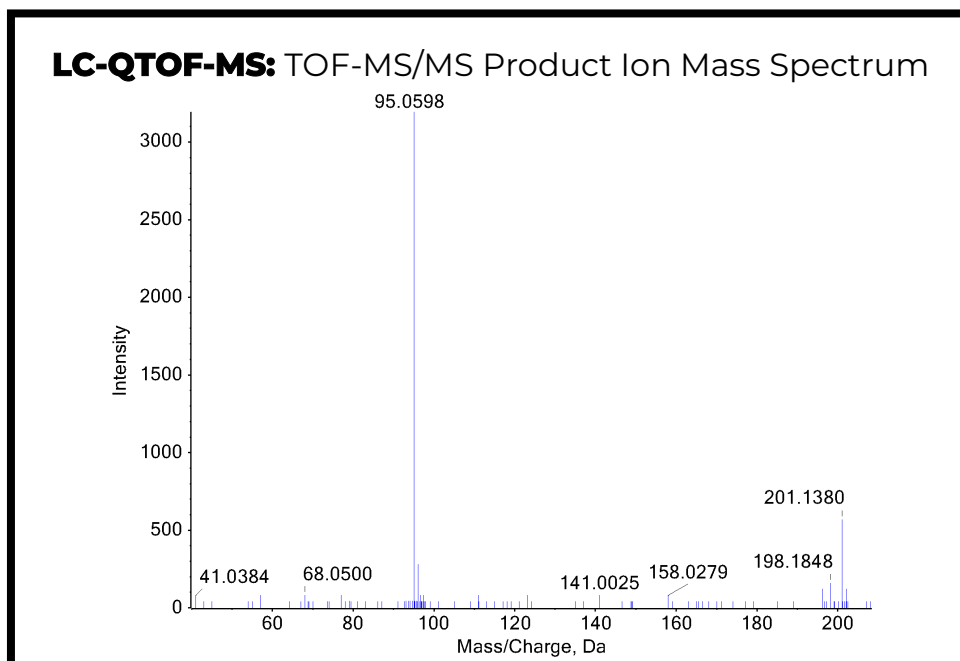
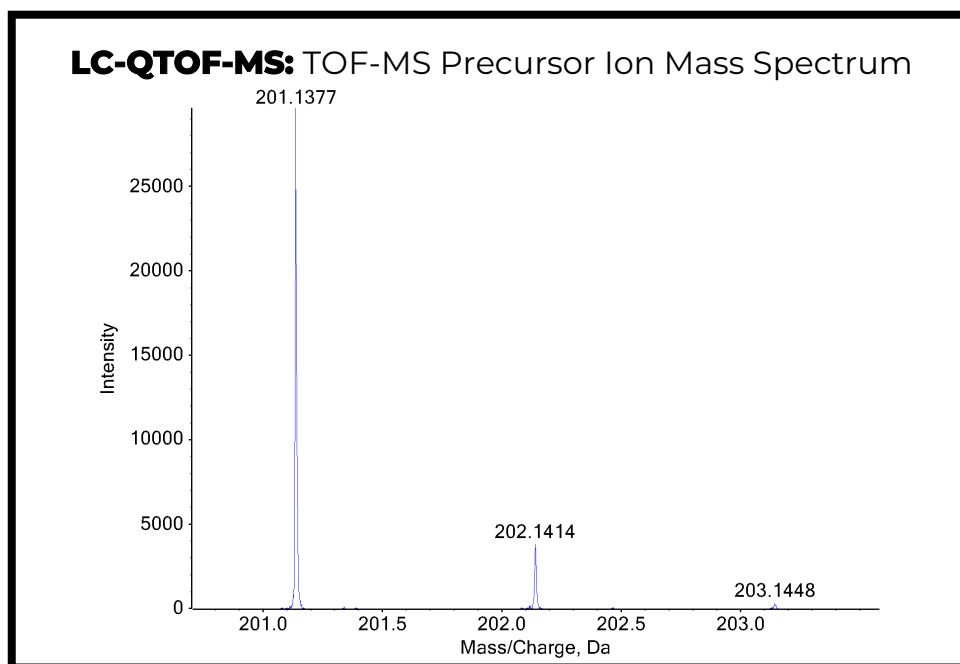
Laboratory: Center for Forensic Science Research and Education (CFSRE, Willow Grove, PA, USA)

Instrument: Sciex X500R LC-QTOF-MS

Methods: www.cfsre.org/nps-discovery/monographs

Sample Preparation: Liquid-liquid extraction

[LC-QTOF-MS Method Details](#)



Confirmation Using Drug Standard: Reference material (Batch: 0608245-16) was purchased from Cayman Chemical (Ann Arbor, MI, USA). The analyte was confirmed to be medetomidine based on retention time (sample: 5.73 min vs. standard: 5.73 min) and mass spectral data comparisons.