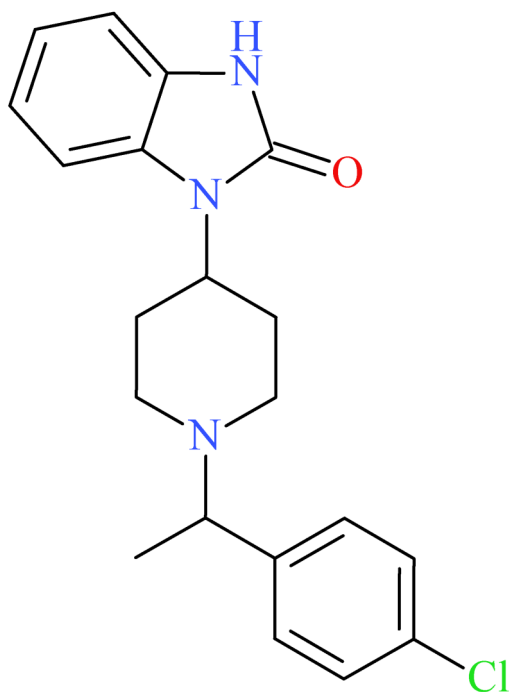




## Chlorphine



NPS SUBCLASS
Opioid
REPORT DATE
December 17, 2024
SAMPLE RECEIVED
August 12, 2024
SAMPLE TYPE
Drug Material

Preferred Name	Chlorphine
Synonyms	Chlorphine
Formal Name	3-[1-[1-(4-chlorophenyl)ethyl]-4-piperidyl]-1H-benzimidazol-2-one
InChI Key	UARBQYKTGNWZBO-UHFFFAOYSA-N
CAS Number	6440-26-2
Chemical Formula	C <sub>20</sub> H <sub>22</sub> ClN <sub>3</sub> O
Molecular Weight	355.9
Molecular Ion [M <sup>+</sup> ]	355
Exact Mass [M+H] <sup>+</sup>	356.1524

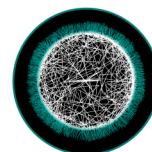
## Characterization & Intelligence

The following information was compiled in December 2024 and is subject to change as new research is conducted and as new information becomes available:

**Description:** Chlorphine is a novel synthetic opioid bearing structural similarity to other benzimidazolones (e.g., bromphine, fluorphine). Chlorphine was first identified by our laboratory in August 2024 and confirmed using standard reference material.

**Sample Source:** Tapestry in Collaboration with StreetCheck

**Sample Appearance:** White material



**STREET CHECK  
COMMUNITY  
DRUG CHECKING**

**Pharmacology:** *In vitro* pharmacological data available show that chlorphine is an agonist with high affinity for the mu-opioid receptor and has activity and potency similar to bromphine.<sup>1</sup>

**Toxicology:** Chlorphine has not been identified in toxicology cases to date at the CFSRE.

**Drug Materials:** Chlorphine has been detected in one drug material to date at the CFSRE.

**Demographics / Geographics:** The drug material positive for chlorphine originated from Connecticut and was identified alongside the novel synthetic opioid *N*-propionitrile chlorphine.

**Legal Status:** Chlorphine is not currently a scheduled drug in the United States.

### References:

- ▶ Cayman Chemical: [Chlorphine](#)
- ▶ <sup>1</sup>Vandeputte et al. (2024) [Elucidating the harm potential of bromphine analogues as new synthetic opioids...](#)

**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 (GC-MS and LC-QTOF-MS) in comparison to analysis of acquired reference material.

**Acknowledgements:** This report was prepared by Sara E. Walton, Kyle Harrington, Ivy Sabal, Cole Altomare-Jarczyk, Abigail Edelmann, Jamie Davis, Max T. Denn, Alexis D. Quinter, Angel McDowell, Joshua S. DeBord, Donna M. Iula, Traci Green, Barry K. Logan, and Alex J. Krotulski at the Center for Forensic Science Research and Education (CFSRE) at the Fredric Rieders Family Foundation. The authors acknowledge scientists at the CFSRE for their involvements and contributions. For more information, contact [npsdiscovery@cfsre.org](mailto:npsdiscovery@cfsre.org) or visit [www.npsdiscovery.org](http://www.npsdiscovery.org).

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**Suggested Citation:** Walton, SE; Harrington, K; Sabal, I; Altomare-Jarczyk, C; Edelmann, A; Davis, J:Denn, MT; Quinter, AD; McDowell, A; DeBord, JS; Iula, DM; Green, T; Logan, BK; Krotulski, AJ. (2024) *Chlorphine — NPS Discovery New Drug Monograph*, Center for Forensic Science Research and Education, United States.

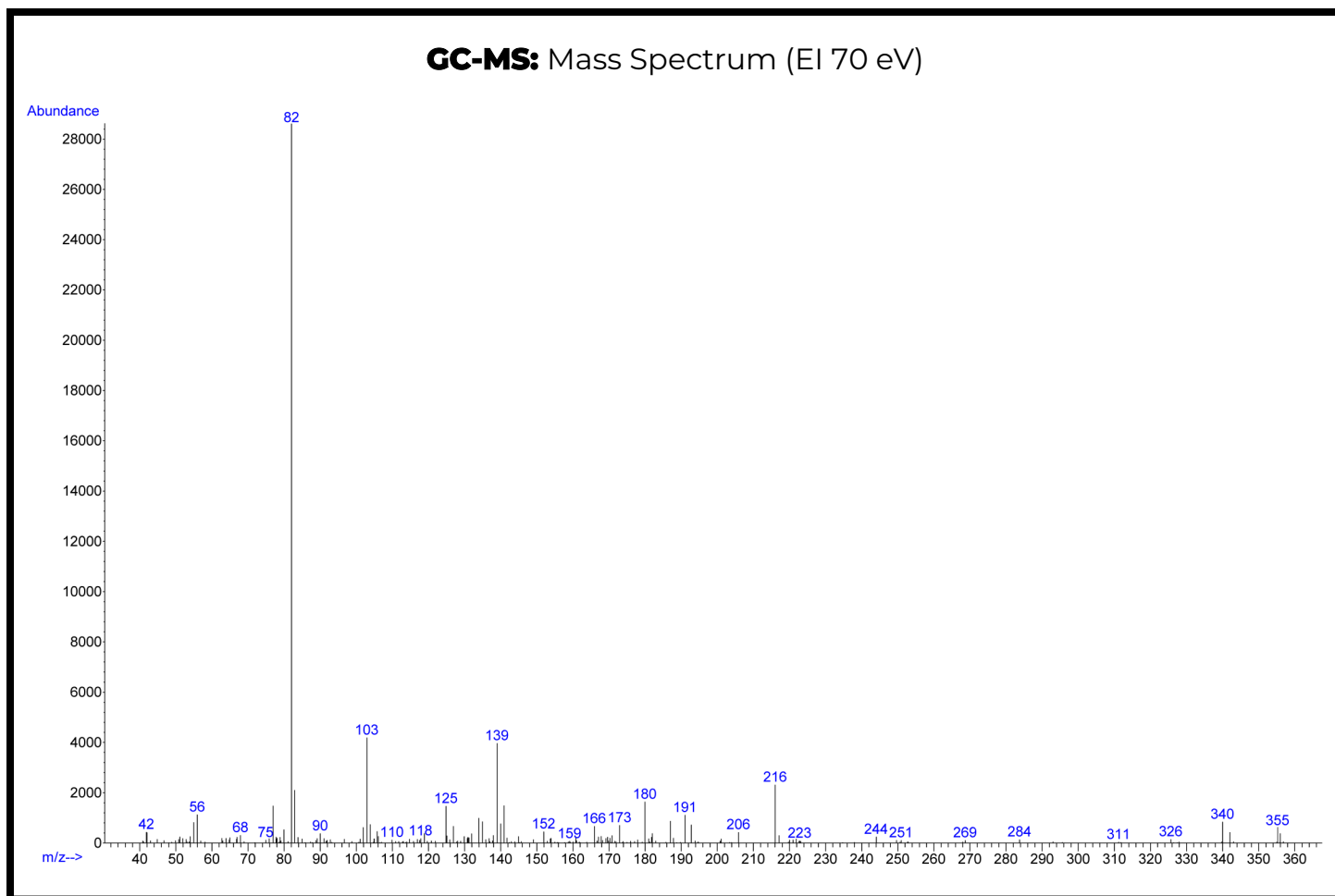
# Gas Chromatography Mass Spectrometry (GC-MS)

**Laboratory:** Center for Forensic Science Research and Education (CFSRE, Horsham, PA, USA)

**Instrument:** Agilent 5975 Series GC/MSD

**Methods:** [GC-MS Method Details](#) & [Monographs](#)

**Sample Preparation:** Acid/base extraction



**Confirmation Using Drug Standard:** Reference material (Batch: 0638269-1) was purchased from Cayman Chemical (Ann Arbor, MI, USA). The analyte was confirmed to be chlorphine based on retention time (sample: 8.88 min vs. standard: 8.88 min) and mass spectral data comparisons.

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

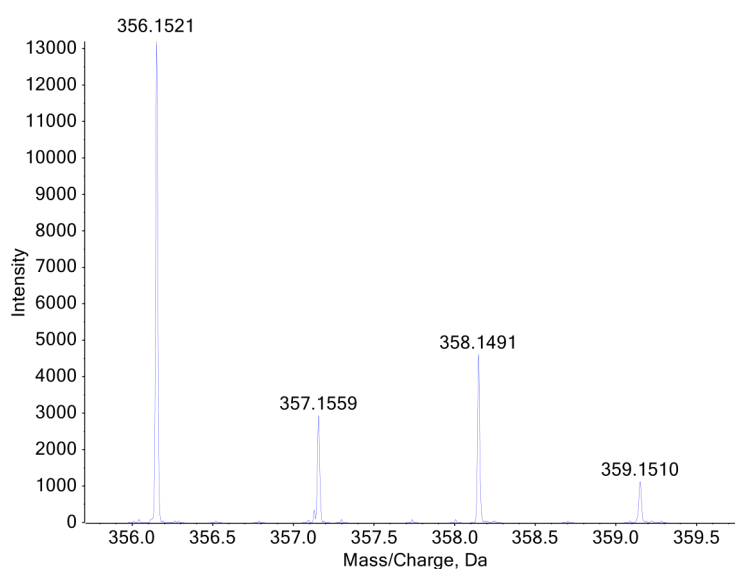
**Laboratory:** Center for Forensic Science Research and Education (CFSRE, Horsham, PA, USA)

**Instrument:** Sciex 5600+ LC-QTOF-MS

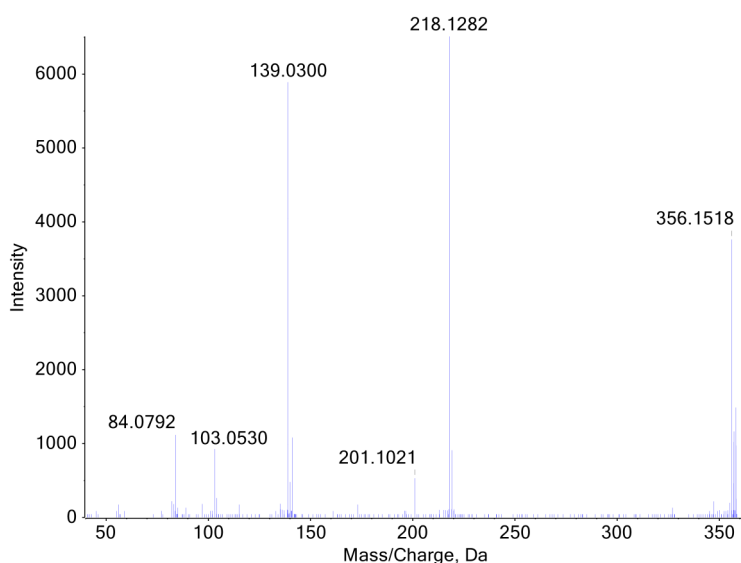
**Methods:** [LC-QTOF-MS Method Details](#) & [Monographs](#)

**Sample Preparation:** Dilution in mobile phase

## LC-QTOF-MS: TOF-MS Precursor Ion Mass Spectrum



## LC-QTOF-MS: TOF-MS/MS Product Ion Mass Spectrum



**Confirmation Using Drug Standard:** Reference material (Batch: 0638269-1) was purchased from Cayman Chemical (Ann Arbor, MI, USA). The analyte was confirmed to be chlorphine based on retention time (sample: 6.24 min vs. standard: 6.26 min) and mass spectral data comparisons.