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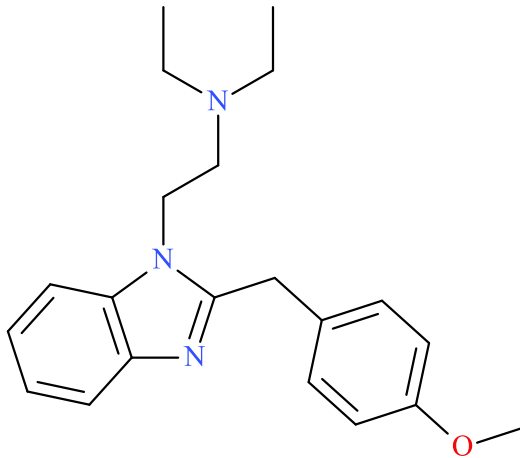
NPS DISCOVERY

Metodesnitazene

Sample Type: **Biological Fluid**

Latest Revision: **September 22, 2021**

Date of Report: **September 22, 2021**



1. GENERAL INFORMATION

IUPAC Name: N,N-diethyl-2-[2-[(4-methoxyphenyl)methyl]benzimidazol-1-yl]ethanamine

InChI String: InChI=1S/C21H27N3O/c1-4-23(5-2)14-15-24-20-9-7-6-8-19(20)22-21(24)16-17-10-12-18(25-3)13-11-17/h6-13H,4-5,14-16H2,1-3H3

CFR: Not Scheduled (09/2021)

CAS# 1071546-40-1

Synonyms: Desnitrometonitazene, Metazene

Source: Montgomery County Coroner's Office (Ohio)

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

Prepared By: Alex J. Krotulski, PhD; Matthew Juhascik, PhD, F-ABFT; Kent Harshbarger, MD; Sara E. Walton, BS; Donna M. Papsun, MS, D-ABFT-FT; Melissa F. Fogarty, MSFS, D-ABFT-FT; and Barry K. Logan, PhD, F-ABFT

2. CHEMICAL DATA

Analyte	Chemical Formula	Molecular Weight	Molecular Ion [M ⁺]	Exact Mass [M+H] ⁺
Metodesnitazene	C ₂₁ H ₂₇ N ₃ O	337.5	337	338.2227

3. SAMPLE HISTORY

To date, metodesnitazene was identified in one case in July 2021. The geographical and demographical breakdown is below:

Geographical Location: Ohio (n=1)

Biological Sample: Blood (n=1)

Date of First Receipt: June 2021

Other Notable Findings: Brorphine (n=1), 2-Methyl AP-237 (n=1), Bromazolam (n=1), Desalkylflurazepam (n=1), Fluoromethamphetamine (n=1), Fluoroamphetamine (n=1), Tramadol (n=1), Mitragynine (n=1)

4. BRIEF DESCRIPTION

Metodesnitazene is classified as a novel opioid of the benzimidazole sub-class and is structurally dissimilar from fentanyl. Novel opioids have been reported to cause psychoactive effects similar to heroin, fentanyl, and other opioids. Novel opioids have also caused adverse events, including death, as described in the literature. Structurally similar compounds include etonitazene, metonitazene, and isotonitazene. Etonitazene and structurally related synthetic opioids were first synthesized and reported in the literature in the 1950s.¹ Data suggest that this group of analogues can have potency similar to or greater than fentanyl.² Recent *in vitro* data suggest that metodesnitazene is much less potent than fentanyl and approximately half the potency of morphine.³ Metodesnitazene is not explicitly scheduled in the United States; however, etonitazene and isotonitazene are Schedule I substances.

5. ADDITIONAL RESOURCES

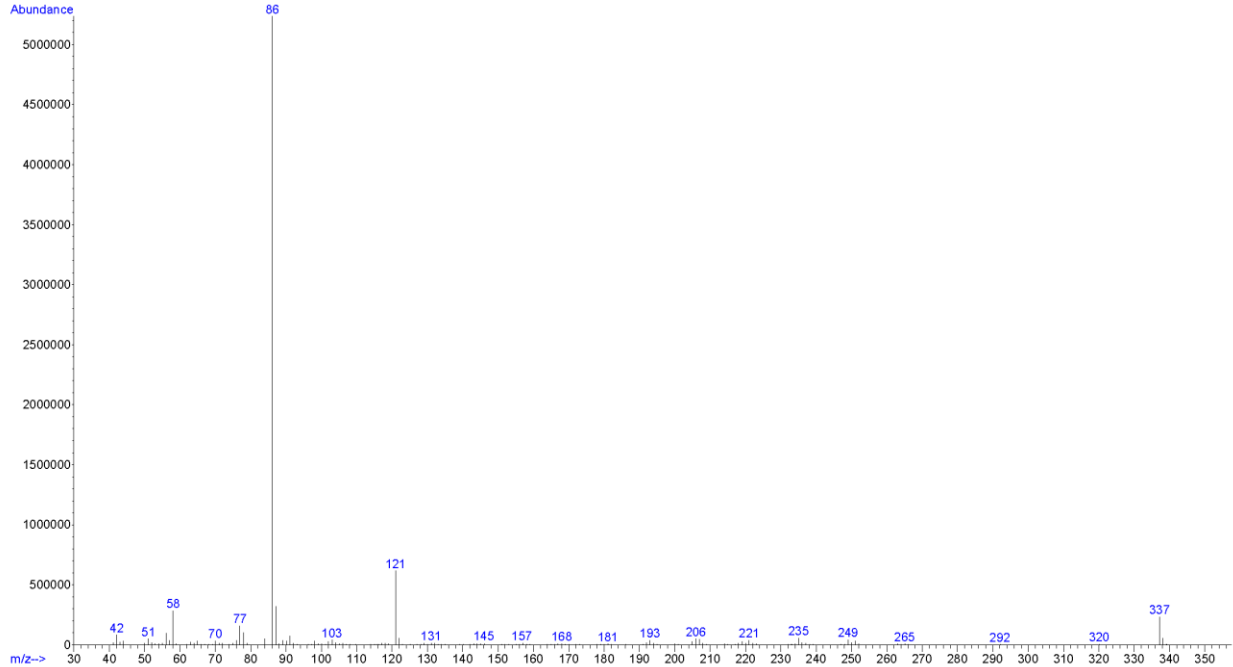
1. Hunger, A; Kebrle, J; Rossi, A; Hoffmann, K. (1957) Synthesis of analgesically active benzimidazole derivatives with basic substitutions. *Experientia*, **13**, 400-401.
<https://link.springer.com/article/10.1007/BF02161116>
2. Hoffmann, K; Hunger, A; Rossi, A. (3 May 1960). "Patent US2935514A – Benzimidazoles."
<https://patents.google.com/patent/US2935514A/en>
3. Vandeputte, MM; Van Uytfanghe, K; Layle, NK; St. Germaine, DM; Iula, DM; Stove, CP. Synthesis, Chemical Characterization, and μ -Opioid Receptor Activity Assessment of the Emerging Group of "Nitazene" 2-Benzylbenzimidazole Synthetic Opioids. *ACS Chem. Neurosci.* 2021. <https://pubs.acs.org/doi/10.1021/acchemneuro.1c00064>
https://www.deadiversion.usdoj.gov/drug_chem_info/benzimidazole-opioids.pdf
[https://www.caymanchem.com/product/30035/metodesnitazene-\(hydrochloride\)](https://www.caymanchem.com/product/30035/metodesnitazene-(hydrochloride))

6. QUALITATIVE DATA

6.1 GAS CHROMATOGRAPHY MASS SPECTROMETRY (GC-MS)

Testing Performed At:	The Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation (Willow Grove, PA)
Sample Preparation:	Standard diluted in methanol
Instrument:	Agilent 5975 Series GC/MSD System
Standard:	Reference material for metodesnitazene (Batch: 0590970-1) was purchased from Cayman Chemical Company (Ann Arbor, MI, USA). https://www.caymanchem.com/product/30035/metodesnitazene-(hydrochloride)

EI (70 eV) Mass Spectrum: Metodesnitazene (Standard)



6.2 LIQUID CHROMATOGRAPHY QUADRUPOLE TIME-OF-FLIGHT MASS SPECTROMETRY (LC-QTOF-MS)

Testing Performed At: The Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation (Willow Grove, PA)

Sample Preparation: Liquid-liquid extraction (LLE)

Instrument: Sciex TripleTOF® 5600+, Shimadzu Nexera XR UHPLC

Column: Phenomenex® Kinetex C18 (50 mm x 3.0 mm, 2.6 µm)

Mobile Phase: A: Ammonium formate (10 mM, pH 3.0)

B: Methanol/acetonitrile (50:50)

Flow rate: 0.4 mL/min

Gradient: Initial: 95A:5B; 5A:95B over 13 min; 95A:5B at 15.5 min

Temperatures: Autosampler: 15 °C

Column Oven: 30 °C

Source Heater: 600 °C

Injection Parameters: Injection Volume: 10 µL

QTOF Parameters: TOF MS Scan Range: 100-510 Da

Precursor Isolation: SWATH® acquisition (27 windows)

Fragmentation: Collision Energy Spread (35±15 eV)

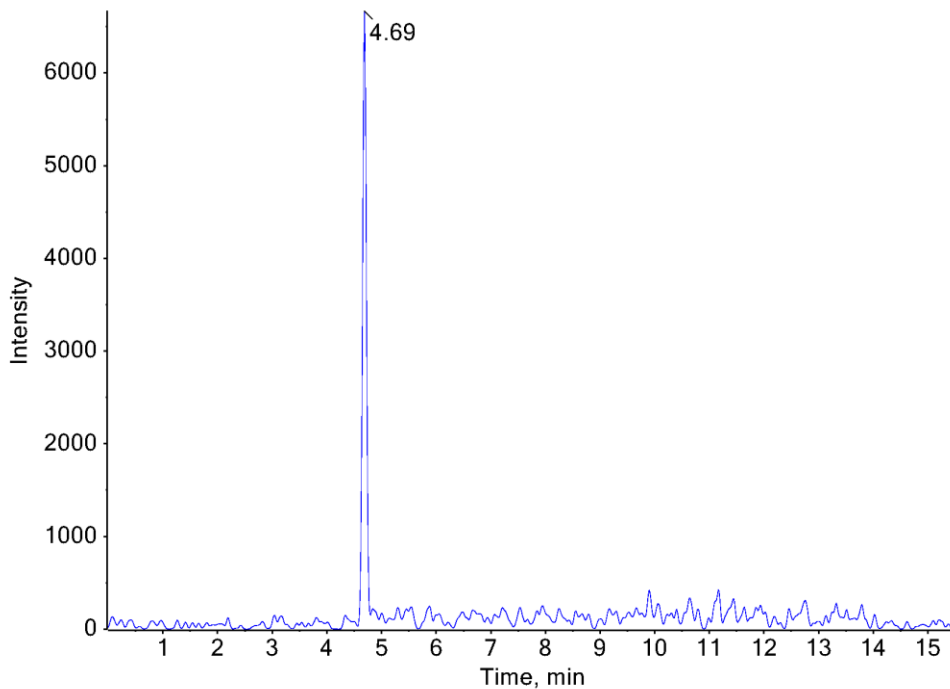
MS/MS Scan Range: 50-510 Da

Retention Time: 4.69 min

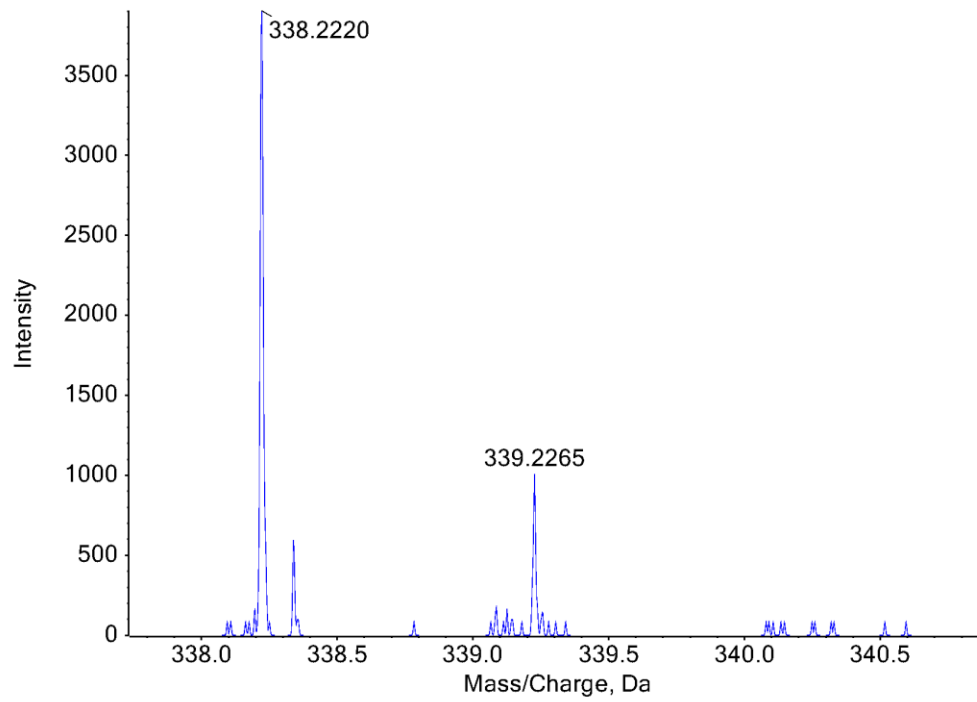
Standard Comparison: Reference material for metodesnitazene (Batch: 0590970-1) was purchased from Cayman Chemical Company (Ann Arbor, MI, USA). Analysis of this standard resulted in positive identification of the analyte in the extract as metodesnitazene, based on retention time (4.73 min) and mass spectral data.

<https://www.caymanchem.com/product/30035/metodesnitazene-hydrochloride>)

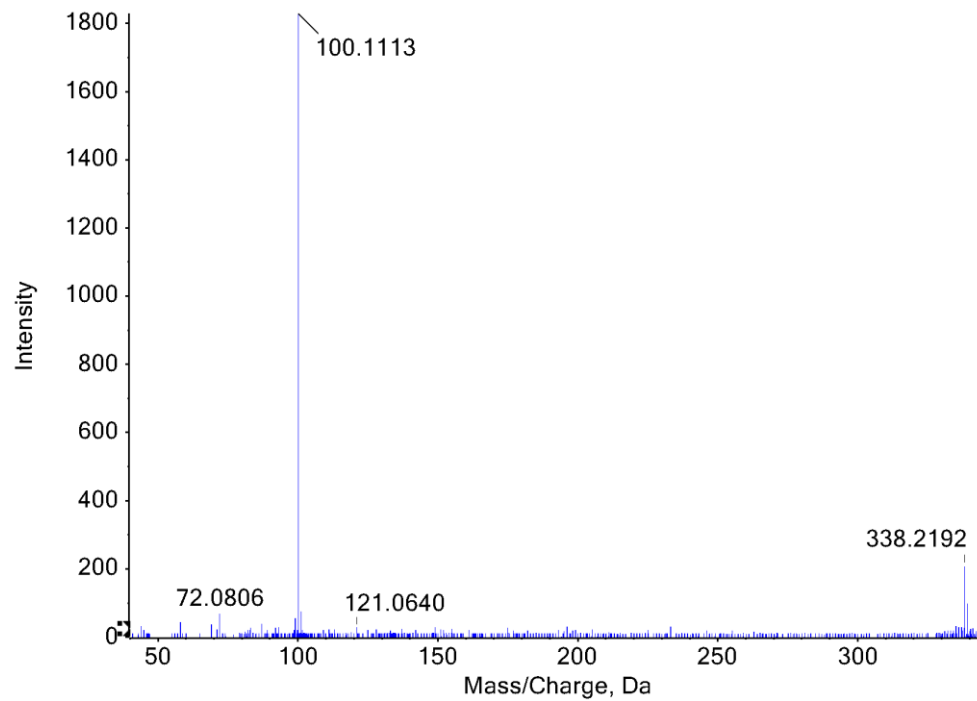
Extracted Ion Chromatogram: Metodesnitazene (Biological Sample)



TOF MS Spectra: Metodesnitazene (Biological Sample)



MS/MS Spectra: Metodesnitazene (Biological Sample)



7. FUNDING

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