



## EU EARLY WARNING SYSTEM FORMAL NOTIFICATION

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Date issued	15 October 2020	RCS ID	EU-EWS-RCS-FN-2020-0035
Issued by	EMCDDA	Transmitted by	Action on New Drugs Sector, EMCDDA
Subject	Formal notification of (4-bromophenyl)-(1-(dimethylamino)-4-hydroxy-4-phenethylcyclohexyl)methanone (carbonyl-bromadol) by Germany as a new psychoactive substance under the terms of Regulation (EU) 2017/2101		

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### 1. Read me first

This document provides formal notification of the analytical identification of (4-bromophenyl)-(1-(dimethylamino)-4-hydroxy-4-phenethylcyclohexyl)methanone (carbonyl-bromadol) for the first time in Europe.

There is no information available on the pharmacology and toxicology of carbonyl-bromadol. Based on its chemical structure and its similarity to bromadol, the substance is expected to have opioid narcotic analgesic effects and is formally notified based on a precautionary principle.

Please report any additional data you have on this substance to: [ews@emcdda.europa.eu](mailto:ews@emcdda.europa.eu)

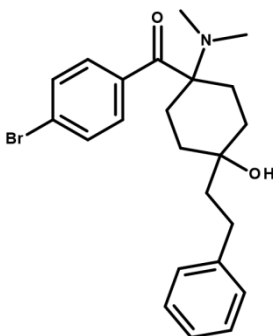
### 2. Data use restrictions

As with all formal notifications issued by the EU EWS remember that they may contain information that could be regarded as sensitive. Should you provide some of the information in this notification to other groups we would ask that you exercise your best judgment on what information needs to be provided. If you have any questions in this respect, please contact us.

### 3. Names of substance and other identifiers

- IUPAC name: (4-bromophenyl)-(1-(dimethylamino)-4-hydroxy-4-phenethylcyclohexyl)methanone
- Chemical names: (4-bromophenyl)-[1-(dimethylamino)-4-hydroxy-4-(2-phenylethyl)cyclohexyl]methanone; (4-bromophenyl)(1-(dimethylamino)-4-hydroxy-4-phenethylcyclohexyl)methanone
- Common name: carbonyl-bromadol
- Chemical formula:  $C_{23}H_{28}BrNO_2$
- Molecular weight: 430.39
- CAS Registry number: not registered
- InChIKey: SQKVCASVOTZNCS-UHFFFAOYSA-N

## Molecular structure



## 4. Substance classification

Opioid

## 5. Detection

Type: Seizure

Case Report identifier: EDND-CR-2020-661

Details: carbonyl-bromadol was identified in 5 grams of white-yellow powder seized by State Police Schleswig-Holstein on 1 July 2020.

The substance was analytically confirmed using GC-MS, FTIR, LC-MS, Raman spectroscopy and NMR by the EU-funded project ADEBAR plus. The free base form of carbonyl-bromadol was identified in the seized sample and the sample was reported to be composed of a mixture of diastereomers of carbonyl-bromadol.

## 6. Chemistry and Analysis

Chemical classification: arylcyclohexylamine; cyclohexylamine

Carbonyl-bromadol, a 4-aminocyclohexanol, is a carbonyl derivative of the opioid bromadol (<sup>1</sup>), also known as BDPC. Bromadol is not under international control and is not currently monitored by the EU Early Warning System.

Carbonyl-bromadol also shares some structural moieties with the opioid bromadoline, formally notified in 2017.

Carbonyl-bromadol may exist in two different configurations (*cis* or *trans*).

The molecular structure of the related compound *trans*-bromadol was reported to be 'superimposable upon the molecular structure of the potent synthetic opioid fentanyl' [1].

<sup>1</sup> 4-(4-Bromophenyl)-4-(dimethylamino)-1-(2-phenylethyl)cyclohexan-1-ol

## 7. Pharmacology and toxicology

Pharmacological classification: opioid

There is no information available on the pharmacology and toxicology of carbonyl-bromadol. Based on its chemical structure and on its similarity to bromadol, the substance is expected to have opioid narcotic analgesic effects.

Bromadol was developed by the Upjohn Company, in the late 1970s, as part of an investigation into a series of 4-aminocyclohexanol compounds [2]. Bromadol was reported to be the most potent compound in this series [3] with effects that were 'reversed by naloxone, indicating that the analgesic activity was mediated via the MOR' ( $\mu$ -opioid receptor) [1]. It was also noted that the *trans* isomer of bromadol was considered to be more potent than the *cis* isomer [1]. In a study by Liu *et al.*, the antinociceptive ED<sub>50</sub> of bromadol, in mouse hot plate, was reported to be 13.4  $\mu$ g/kg and the binding Ki value for the MOR reported to be 1.49 nM [3].

## 8. Further information

Further information on this substance is available on the EDND profile:

<https://ednd2.emcdda.europa.eu/ednd/substanceProfiles/1147>

## 9. Acknowledgements

The German National Focal Point, State Police Schleswig-Holstein, and the EU-funded project ADEBAR plus are kindly acknowledged for the information and analytical data provided.

## 10. Attachments

None.

## 11. References

[1] Sharma KK, et al. The search for the "next" euphoric non-fentanil novel synthetic opioids on the illicit drugs market: current status and horizon scanning. *Forensic toxicology*. 2019;37(1):1-6.

<https://doi.org/10.1007/s11419-018-0454-5>

[2] Lednicer D. 4-Amino-cyclohexanols, their pharmaceutical compositions and methods of use. (1982) US Patent 1982; 4366172.

[3] Liu ZH, et al. Opioid activity of C8813, a novel and potent opioid analgesic. *Life Sciences*. 2003;73(2):233-41. [https://doi.org/10.1016/S0024-3205\(03\)00263-7](https://doi.org/10.1016/S0024-3205(03)00263-7)