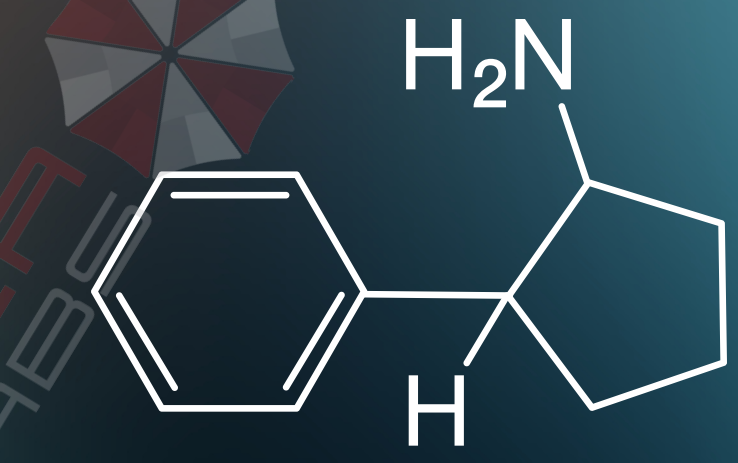


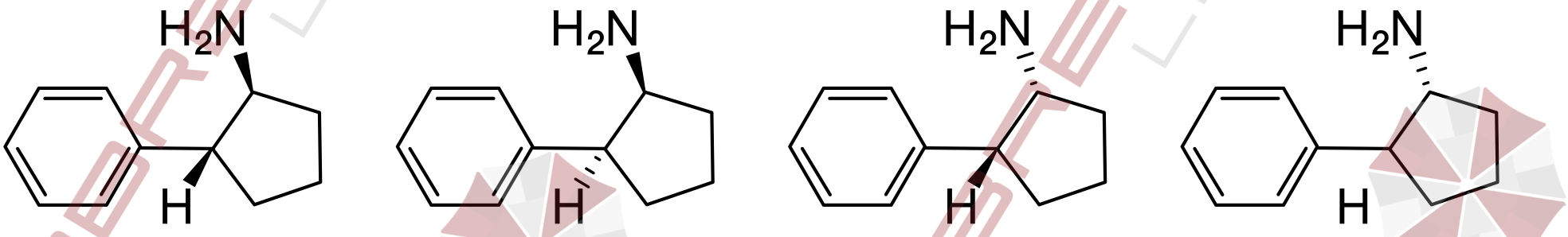
Cypenamine: History and Brief Overview

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History

Cypenamine is a psychostimulant known since the 1940s. It has never been approved in any country as a pharmaceutical drug. It shows structural analogy to many other psychostimulants, most notably the amphetamines and monoamine oxidase inhibitors like tranylcypromine. Functionally, it has been described as an antidepressant.[1]

Cypenamine possesses 2 stereocenters, meaning the compound has 4 possible stereoisomers. The active compound is reported to either be (1R,2S)-trans-2-phenylcyclopentan-1-amine or (1S,2R)-trans-2-phenylcyclopentan-1-amine.2 When compared to similar compounds, it is however likely that all 4 isomers will have a varying degree of impact on human physiology. The four stereoisomers are depicted below.



Left to right: (1S,2R)-trans-cypenamine, (1S,2S)-cis-cypenamine, (1R,2R)-cis-cypenamine, (1R,2S)-trans-cypenamine

The synthesis of Cypenamine has been published in the patent US2520516A. Beside this, the synthesis has also been achieved via alternative routes.3,1 The separation of the trans- and cis-Stereoisomer pairs has also been described using an enzyme from the fungus Candida antarctica.[2]

Mechanism of Action

There are no peer-reviewed studies available that give information about the mechanism of action or the pharmacological properties. Based on structural analogies, it is likely that cypenamine is either a monoamine oxidase inhibitor or

an inhibitor of the dopamine/serotonin/norepinephrine transporter, or a combination of the aforementioned.

References

[1] Joseph N, Rajan R, John J, Devika NV, Chand SS, Suresh E, Pihko PM, Radhakrishnan KV. An exclusive approach to 3,4-disubstituted cyclopentenes and alkylidene cyclopentenes via the palladium catalyzed ring opening of azabicyclic olefins with aryl halides. *RSC Adv.* **2013**; 3:7751. doi: 10.1039/c3ra41504j.

[2] González-Sab1,n J, Gotor V, Rebolledo F. Kinetic resolution of (±)-trans- and (±)-cis-2-phenylcyclopentanamine by CALB-catalyzed aminolysis ofesters: the key role of the leaving group. *Tetrahedron: Asymmetry.* **2004**;15:481—488. doi: 10.1016/j.tetasy.2003.11.013.

[3] Burgos A, Kamenka J-M, Rousseau B. Use of tritiated methylborane in the synthesis of labelled primary amines. Labelled *Comp Radiopharmac.* **1991**;29:1347—1350. doi: 10.1002/jlcr.2580291212.

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