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Towards the Total Synthesis of Psilocybin/Psilocin: A Known Natural Psychoactive Compound with Prominent Therapeutic Properties

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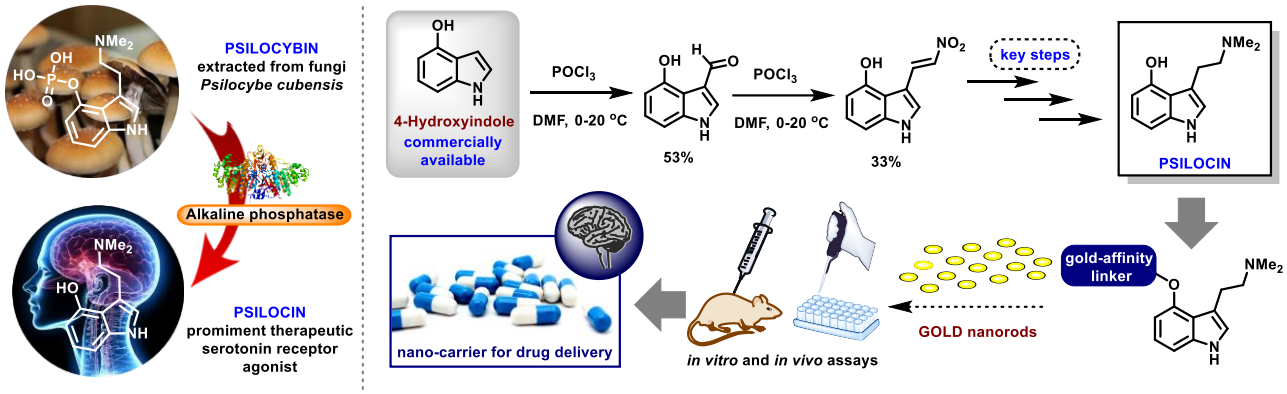
ABSTRACT

Nowadays, one in every eight people lives with a mental disorder.[1] However, easy access to effective treatment is not always available. Therefore, developing new alternatives for accessible treatment is in high demand. Psilocybin, a well-known psychoactive compound, can represent a viable option. It belongs to the hallucinogenic tryptamines/indolamines found in various mushroom species[2]. It has been gaining attention as a therapeutic agent.[3] Psilocybin is rapidly metabolized leading to its metabolite psilocin[4] which acts as a selective serotonin receptor agonist and is a classic hallucinogen.[5] It has shown promise in the treatment of alcoholism,[6] smoking,[7] depression,[8] obsessive-compulsive disorder[9], and anxiety.[8] The synthetic importance of psilocybin and psilocin is therefore clear. In this work we propose an optimized synthetic route for obtaining an unprecedented nano-carrier system for drug delivery using psilocin as the center bioactive unit, leading to a prominent new therapeutic methodology.



Scheme 1. Overview of the development of a new nano-carrier system for drug delivery using psilocin.

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REFERENCES

(1) *World Health Organization.* https://www.who.int/news-room/fact-sheets/detail/mental-disorders (accessed 2024.07.11). (2) Passie, T.; Seifert, J.; Schneider, U.; Emrich, H. M.; *Addict. Biol.*, **2002**, *7*, 357–364. (3) Grob, C. S.; Danforth, A. L.; Chopra, G. S.; Hagerty, M.; McKay, C. R.; Halberstadt, A. L.; Greer, G. R.; *Arch. Gen. Psychiatry*., **2011**, *68*, 71–80. (4) Hasler, F.; Bourquin, D.; Brenneisen, R.; Bär, T.; Vollenweider, F. X.; *Pharm. Acta Helvetiae*, **1997**, *72*, 175–184. (5) Klein, L. M.; Cozzi, N. V.; Daley, P. F.; Brandt, S. D.; Halberstadt, A. L.; *Neuropharmacol.*, **2018**, *142*, 231–239. (6) Bogenschutz, M. P.; Forcehimes, A. A.; Pommy, J. A.; Wilcox, C. E.; Barbosa, P. C. R.; Strassman, R. J.; *J. Psychopharmacol.*, **2015**, *29*, 289–299. (7) Johnson, M. W.; Garcia-Romeu, A.; Cosimano, M. P.; Griffiths, R. R.; *J. Psychopharmacol.*, **2014**, *28*, 983–992. (8) Griffiths, R. R.; Johnson, M. W.; Carducci, M. A.; Umbricht, A.; Richards, W. A.; Richards, B. D.; Cosimano, M. P.; Klinedinst, M. A.; *J. Psychopharmacol.*, **2016**, *30*, 1181–1197. (9) Moreno, F. A.; Wiegand, C. B.; Taitano, E. K.; Delgado, P. L.; *J. Clin. Psychiatry*, **2006**, *67*, 1735–1740.