engineering proceedings

MDPI

Proceedings

Intranasal nanoparticles for the treatment of depression and anxiety disorders

Margarida Alberto[1,a], Ana Cláudia Paiva-Santos[1,2], Francisco Veiga[1,2] and Patrícia C. Pires[1,2,3,b]

[1] Faculty of Pharmacy (FFUC-UC), University of Coimbra, Azinhaga de Santa Comba, 3000-548 Coimbra, Portugal
[2] REQUIMTE/LAQV, Group of Pharmaceutical Technology, Faculty of Pharmacy, University of Coimbra, Coimbra, Portugal
[3] Health Sciences Research Centre (CICS-UBI), University of Beira Interior, Av. Infante D. Henrique, 6200-506 Covilhã, Portugal
[a] margaridaalberto99@gmail.com; [b] patriciapires93@gmail.com or patriciapires@ff.uc.pt

The treatment of central nervous system disorders, such as depression and anxiety, relies on the oral administration of drugs with antidepressant or anxiolytic action. Given the increased incidence of these diseases, and the disadvantages of oral drug administration, studies are being done with the aim of developing new ways of treatment, in order to improve the effectiveness of the therapies that are applied.

The intranasal pathway gained interest as a route of administration of drugs to the intended target, the brain, due to allowing a direct transport to the central nervous system. In addition to the route of administration, nanoparticles have been studied as possible alternatives to conventional formulations, with the objective of improving drug bioavailability. The present work aimed to analyze the potential of intranasal nanoparticle administration for the treatment of depression and anxiety, using the analysis of several studies already performed.

From the carried-out analysis, it was concluded that nanoparticle development takes into consideration the characteristics of the nasal mucosa to allow enhancing drug absorption and permeability. The use of nanoparticles allows to protect the drug from enzymatic degradation, and the modulation of its components provides advantages for intranasal administration. *In vitro* drug release and *ex vivo* drug permeation studies were conducted, demonstrating, in the majority of cases, an advantage of the use of these formulations. *In vivo* studies, in rats or mice, were also carried out, allowing to verify the efficacy of the treatment with the developed formulations, with results being very promising.

Citation: Lastname, F.; Lastname, F.; Lastname, F. Title. *Eng. Proc.* **2022**, *4*, x. https://doi.org/10.3390/xxxxx

Academic Editor: Firstname Lastname

Published: date