

Proceeding Paper

Brain Targeting of Antidepressant and Anxiolytic Drugs [†]

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Abstract: Depression and anxiety are high incidence and debilitating psychiatric disorders, usually treated by antidepressant or anxiolytic drug administration (respectively). Nevertheless, this treatment is usually done through the oral route, but the low permeability of the blood-brain barrier, that has the many functions of being a barrier to prevent the entry of external substances into the brain, reduces the amount of drug that will be able to reach the brain, also reducing, consequently, therapeutic efficacy. Which is why new solutions have been tried to make these treatments more effective, safer, and faster. To overcome this obstacle, in the articles analyzed in this work three main strategies were used to improve brain drug targeting: the intranasal route of administration, which allows the drug to be directly transported to the brain by neuronal pathways (olfactory and trigeminal nerves), bypassing the blood-brain barrier and avoiding hepatic and gastrointestinal metabolism; the use of nanosystems for drug encapsulation, including polymeric and lipidic nanoparticles, nanometric emulsions and nanogels; and drug molecule functionalization, by the attachment of ligands such as peptides and polymers. Pharmacokinetic and pharmacodynamic results showed that intranasal administration can be more efficient in brain targeting than other routes (such as intravenous or oral administration), as well as the use of nanoformulations and drug functionalization, which are also quite beneficial in increasing brain drug bioavailability.

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