

## NanoInnovation 2020

### Curcumin Nanocrystals for intranasal administration: promising strategy to achieve brain targeting

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Intranasal (IN) route is an attractive strategy to deliver drugs to the Central Nervous System (CNS).

The properties of the drug and its potency are crucial factors when a molecule is formulated for nasal delivery. IN dosing is suitable for potent drugs since only a limited volume can be sprayed into the nasal cavity. Many medications are not adequately concentrated to achieve ideal dosing volumes. This requirement is challenging for hydrophobic drugs having a limited aqueous solubility [1].

Nanocrystals (NCs) may overcome these limitations being made from almost 100% drug and by improving the solubility of hydrophobic drugs such as curcumin.

Curcumin was selected for its nature belonging to the class IV of the biopharmaceutics classification system and for its implications in the treatment of CNS diseases [2].

Despite NCs technology has been developed widely over the past 20 years, to the best of our knowledge, the application of curcumin NCs for nose-to-brain delivery represents a novelty that has not been yet explored. The development of NC was designed by the statistical design of experiment (DoE) approach to explore the complex relationships among input and output parameters with small effort, reducing cost and time and ensuring product quality [3].

NC was optimized based on the desirability function and characterized by a physico-chemical, technological and biological point of view. Our results showed that Olfactory Ensheathing Cells efficiently took up the NCs compared to the free curcumin showing that NCs can ameliorate drug permeability.

#### References

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