# Article information:

On a highway to the brain: A review on nose-to-brain drug delivery using nanoparticles - ScienceDirect
<https://www.sciencedirect.com/science/article/pii/S2352940722002657>

# Article summary:

1. The blood-brain barrier (BBB) prevents the passage of foreign compounds from the blood to the brain's extracellular fluid, making it difficult to treat diseases that affect the central nervous system (CNS).

2. Intranasal drug delivery using nanoparticles provides a promising passage for delivering drugs to the brain, allowing direct entry to the CNS mainly through the sensory neuronal pathway or indirectly by passage across the BBB from the systemic circulation.

3. Nanoparticle-based systems have demonstrated an outstanding capacity to overcome challenges presented by intranasal drug delivery and produce drug accumulation in the brain while avoiding systemic distribution. This review covers recent developments in polymer, lipid, and inorganic nanoparticles, as well as drug nanocrystals, for delivering drugs to the brain via intranasal administration.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article "On a highway to the brain: A review on nose-to-brain drug delivery using nanoparticles" provides an overview of the potential benefits and challenges of using intranasal administration for delivering drugs to the central nervous system (CNS). The authors highlight the limitations of current treatments for CNS diseases, which are partially effective and associated with severe side effects due to systemic drug distribution. They argue that intranasal delivery, particularly through the use of nanoparticle-based systems, offers a promising alternative by allowing direct entry to the CNS while avoiding systemic distribution.

The article provides a comprehensive review of recent developments in the use of polymer, lipid, and inorganic nanoparticles, as well as drug nanocrystals, for delivering drugs to the brain via intranasal administration. The authors discuss the advantages and limitations of each approach and provide a general discussion on favorable aspects and limitations of this approach.

One potential bias in this article is its focus on nanoparticle-based systems as a solution for overcoming the challenges presented by intranasal delivery. While these systems have shown promise in preclinical studies, their safety and efficacy in humans remain uncertain. The article does not explore potential risks associated with nanoparticle-based drug delivery or consider alternative approaches that may be safer or more effective.

Additionally, while the article acknowledges some of the challenges posed by nose physiology, such as limited volume capacity and mucociliary clearance, it does not fully address how these factors may impact drug absorption through intranasal administration. Further research is needed to better understand how these factors affect drug delivery via this route.

Overall, while this article provides valuable insights into recent developments in nose-to-brain drug delivery using nanoparticles, it should be read with caution given its potential biases towards promoting nanoparticle-based systems without fully exploring their limitations or considering alternative approaches.

# Topics for further research:

* Intranasal drug delivery limitations and challenges
* Safety and efficacy of nanoparticle-based drug delivery systems
* Alternative approaches for nose-to-brain drug delivery
* Impact of nose physiology on drug absorption via intranasal administration
* Preclinical studies on intranasal drug delivery to the CNS
* Clinical trials on intranasal drug delivery for CNS diseases

# Report location:

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