Editorial

iMedPub Journals
www.imedpub.com

Molecular Enzymology and Drug Targets
ISSN 2572-5475

2021
Vol.7 No.2:e005

Use of Nano Particles to Cross Blood Brain Barrier

Helen Mathews*

Department of Pharmaceutical and Pharmacological Sciences, University of Padova, Via F. Marzolo 5, 35131 Padova, Italy

***Corresponding author:** Helen Mathews, Department of Pharmaceutical and Pharmacological Sciences, University of Padova, Via F. Marzolo 5, 35131 Padova, Italy, E-mail: Helen.m@hotmail.com

Received date: October 8, 2021; **Accepted date:** October 22, 2021**; Published date:** October 29, 2021

Citation: Mathews M (2021) Use of Nano Particles to Cross Blood Brain Barrier. Mol Enzy Drug Targ Vol: 7 No 2:e005

Description

The brain is that the third biggest organ within the body. The 7 mm layer of skull, along with three meninges, protects the brain from physical injuries. The Blood–Brain Barrier (BBB) is another membrane that protects the brain. This, as the name implies, may be a barrier between the blood arteries (capillaries) of the brain and therefore the cells and other components that comprise brain tissue. Whereas t he skull, meninges, a nd spinal fluid protect against physical h arm, t he blood–brain barrier protects against disease-causing viruses and poisons found in human blood.

The blood–brain barrier (BBB) prevents most medications from entering the brain from the blood. The existence of the BBB makes it challenging to seek out novel therapies for brain illnesses or new radiopharmaceuticals for brain MRI. Drugs having large molecular size cannot cross the BBB. While it's commonly thought that tiny molecules are widely transported over the BBB, the truth is that 98% of all small molecules aren't carried across the BBB. The typical BBB severely limits the transit of most medications from plasma to the extracellular space, with over 8-log differential within the entrance rate of small, lipid-soluble compounds over big proteins. Understanding the mechanics of medication transport to the CNS requires knowledge of BBB properties. Apart from unidirectional and bidirectional transport of small molecules, additional macromolecules can enter brain tissue *via* a receptor-mediated mechanism.

Applying different techniques for modifying the BBB for medication delivery to the brain are employed, including osmotic and chemical opening of the BBB, similarly because the use of transport/carriers. It's possible to avoid the BBB by employing a different route of administration, like trans nasal. If focused delivery to the brain parenchyma isn't desired, other means of bridging the blood–cerebrospinal fluid barrier is also studied, or medications is also given directly into the body fluid channels by spinal puncture. Invasive treatments for bypassing the BBB include surgical procedures that introduce directly into the brain. The disadvantages of forcefully opening the BBB include damage to the barrier and uncontrolled drug entry into the brain. There are several potentially useful treatment medicines for neurological diseases; however their usage is restricted because of poor transport over the BBB. Understanding of the BBB's cell biology has displayed new routes and possibilities for breaching this barrier.

Use of NPs to Cross BBB

The use of Nano-Particles (NPs) to transport medications to the brain across the BBB might provide a considerable advantage over present methods. In contrast to forced delivery techniques, NPs is also delivered across the BBB by carriers, also called Nano carriers, without causing any harm to the BBB the basic good thing about NP carrier technology is that NPs make amends for the therapeutic drug molecule's BBB-limiting properties Additionally, this mechanism may delay drug release within the brain, reducing peripheral toxicity. The sort of polymer or surfactant employed, the scale of the NP, and therefore the drug molecule are all factors that impact transport. Several natural products (NPs) are used for drug administration *via* various ways for various bodily systems, but only those pertinent to the BBB are brie ly addressed during this section. The anticancer medicine doxorubicin is one example of a drug that has been effectively delivered into the brain *via* NPs.

Most of the ways listed for medication passage over the BBB may be improved by nanotechnology, and a few of the mechanisms involved include:

- NPs break down the tight connections between endothelial cells, allowing the medication to pass over the BBB.
- NPs are transcytosed through the endothelial cell layer
- NPs are endocytosed by endothelial cells and release the drug inside the cell
- NP coating agents like polysorbates inhibit trans membrane efflux systems (i.e., P -glycoprotein)
- NPs may induce local toxic effects on the brain vasculature, leading to limited permeabilization of brain endothelial cells.