

# **Drug delivery to the brain: How to overcome the blood-brain barrier?**

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Neurological diseases such as Alzheimer's disease and Parkinson Disease are becoming more prevalent worldwide. Unfortunately, treatment of neurological diseases is hindered by the inability of up to 98% of drugs with therapeutic relevance to cross the blood-brain barrier (BBB).

The blood-brain barrier (BBB) forms a chemical, physical and immunological barrier between the blood and the brain tissue. The BBB is formed by brain capillary endothelial cells (BCECs), which are interconnected by tight junctions, creating a tight seal between BCECs. Furthermore astrocytes and pericytes are situated in the near vicinity of the BCECs and helps strengthen the barrier properties of the BCECs.

In order to enhance drug delivery to the brain, different approaches have been developed. For decades, drug carriers like liposomes, antibodies and nanoparticles e.g. gold- or magnetic nanoparticles, have been investigated for the purpose of overcoming the restraints of the BBB. Which criteria the drug carriers should fulfill for the construction of an optimal design for overcoming the BBB are partly known, but many details are still to be discovered.