

# Polymeric Nanoparticles for Brain Drug Delivery - A Review

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## ABSTRACT

**Background:** Blood-brain barrier (BBB) plays a most hindering role in drug delivery to the brain. Recent research comes out with the nanoparticles approach, is continuously working towards improving the delivery to the brain. Currently, polymeric nanoparticle is extensively involved in many therapies for spatial and temporal targeted areas delivery.

**Methods:** We did a non-systematic review, and the literature was searched in Google, Science Direct and PubMed. An overview is provided for the formulation of polymeric nanoparticles using different methods, effect of surface modification on the nanoparticle properties with types of polymeric nanoparticles and preparation methods. An account of different nanomedicine employed with therapeutic agent to cross the BBB alone with biodistribution of the drugs.

**Results:** We found that various types of polymeric nanoparticle systems are available and they prosper in delivering the therapeutic amount of the drug to the targeted area. The effect of physicochemical properties on nanoformulation includes change in their size, shape, elasticity, surface charge and hydrophobicity. Surface modification of polymers or nanocarriers is also vital in the formulation of nanoparticles to enhance targeting efficiency to the brain.

**Conclusion:** More standardized methods for the preparation of nanoparticles and to assess the relationship of surface modification on drug delivery. While the preparation and its output like drug loading, particle size, and charge, permeation is always conflicted, so it requires more attention for the acceptance of nanoparticles for brain delivery.

**KEYWORDS:** Brain drug delivery, polymer, nanoparticles, nanomedicine, biodistribution, nanoformulation.

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