Challenges in the Development of Nanoparticle-based Systems for Enzyme Loading and Brain Targeting

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Design and delivery of nanoparticles that overcome the barriers of the body and circulation is a daunting task. This becomes even more difficult when the objective is to cross the BBB for treating brain disorders. Lastly, loading biologically active enzymes requires a more delicate system that can preserve their structure and activity to have any hope for a therapeutic effect. This presentation will focus on these difficulties explaining the barriers involved in creating nanoparticles that can entrap, protect, and safely delivery enzymes to the brain. It will highlight data from recent years that have been successful in overcoming some of these barriers, as well as describe their shortcomings. These data reveal valuable insight in creating possible enzyme therapeutics for treating brain diseases.