

# Delivery of gold nanoparticles to the brain by conjugation with a peptide that recognizes the transferrin receptor

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The treatment of Alzheimer's disease and many other brain-related disorders is limited because of the presence of the blood-brain barrier, which highly regulate the crossing of drugs. Metal nanoparticles have unique features that could contribute to the development of new therapies for these diseases. Nanoparticles have the capacity to carry several molecules of a drug; furthermore, their unique physico-chemical properties allow, for example, photothermal therapy to produce molecular surgery to destroy tumor cells and toxic structures. Recently, we demonstrated that gold nanoparticles conjugated to the peptide CLPFFD are useful to destroy the toxic aggregates of  $\beta$ -amyloid, similar to the ones found in the brains of patients with Alzheimer's disease. However, nanoparticles, like many other compounds, have null or very low capacity to cross the blood-brain barrier. In order to devise a strategy to improve drug delivery to the brain, here we introduced the peptide sequence THRPPMWSPVWP in