

# Brain & Nanomedicine: where we are and where to go

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The research of non-invasive therapy for the treatment of neurodegenerative diseases is one of the most important topics of the last years by the pharmaceutical technology. Even if less than 1% of both industrial and university research projects on neuroscience displays of a Blood-Brain Barrier (BBB) crossing and CNS targeting aims, the study and progress of drug delivery strategies to cross the BBB are supposed to be widely addressed. Above a wide overview on the most interesting and recent applications of nanomedicines to the CNS targeting, in this talk, the most recent works on poly-lactide-co-glycolide and other polymer-based NPs differently modified for BBB crossing will be reviewed. In particular, different strategies based on different ligands for BBB crossing, as exogenous-like peptides, endogenous-like peptides BBB-receptor antibodies and glyco-peptides will be detailed. With this talk, we will therefore try to draw an overview of the main advantages of the use of nanomedicine-based approach for innovation in crossing the most “defensive” barrier in our body, with particular relevance to neurodegenerative diseases. Besides these aspects, a critical analysis on the main causes that slow the application of nanomedicine to brain disorders will be discussed along with the identification of possible solutions and possible interventions. Will there be a future for nanomedicine for brain diseases application and more generally for targeted nanomedicines?