Peptide nanomaterials as Targeted Therapies for Glioblastoma

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Brain diseases are responsible for 12% of global deaths and their treatment could benefit from the use of highly potent and specific pharmaceuticals with low inherent toxicity and immunogenicity such as neuropeptides 1. However, for neuropeptide therapies to be realised, peptides need to be able to cross the blood-brain barrier (BBB) and possess enhanced enzymatic stability to ensure adequate brain bioavailability. Lipidisation of peptides has been proven to be a useful strategy to enhance enzymatic stability and BBB permeability, while increasing the amphiphilicity of neuropeptides allows their self-assembly in well-defined nanostructures 2,3. We have developed a neuropeptide amphiphile able to self-assemble and entrap brain impermeable drugs, which; possess enhanced stability to enzymatic degradation, permeates the BBB (all human *in vitro* BBB model) and targets receptors overexpressed in glioblastoma cells resulting in a novel targeted nanomedicine with a strong anti-proliferative and apoptotic effects *in vitro*. The proposed nanomedicine can be readily translated and proof of concept in an animal model is under way.

References
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