PERSONA CIÈNCIA EMPRESA
UNIVERSITAT RAMON LLULL

Title: Design, synthesis and testing of a new family of branched poly(β-aminoester) polymers for nucleic acids encapsulation

Summary: The delivery of nucleic acids into cells requires the use of a vector to cross plasmatic cell membrane. Poly(β-aminoester) polymers (PBAEs) demonstrated their superiority in performing this cellular crossing, however, their delivery is not always selective enough, which could compromise the safety of a future therapy. Additionally, some targets are present in a low yield on the nanoparticle surface and thus, are not able to promote the envisaged selective delivery. To overcome this limitation, the incorporation of a directing ligand at the terminus of lateral branched polymers could increment the number of targeting moieties per polymer and thus contribute to the selective delivery. The GEMAT and the CRISOL group's at IQS have decided to join effort to develop a new series of hyper branched poly(β-aminoesters), HPBAEs, which are hypothesized to be more selective when incorporating a targeting moiety, for example, to dendritic cells, for mRNA vaccination purposes or to reluctan stem cells. The aim of this TFM proposal consists of tailoring a better formulation based on mentioned HPBAEs with enhanced targeting selectivity. The selected student will be in charge of: 1) synthesizing the new hyper branched HPBAEs candidates; 2) formulating and physiochemically characterize the novel nanoparticles; 2) *in vitro* test of their biocompatibility; and 3) *in vitro* test their selective transfection by performing competition studies.

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