

Self-assembled functional acrylic copolymers and terpolymers and their use as vehicles of bioactive compounds

Market sector: nanomedicine, regenerative medicine

Type of opportunity: licensing and/ or co-development

Scope of the problem

Nanomedicine represents one of the most attractive tools to develop new therapies to effectively treat some diseases. However, one of the most relevant limitations of nanoparticles (NPs) drug delivery systems is their poor cellular internalization that significantly reduces the intracellular dosages of drugs to the level below the therapeutic window. In this sense, it is imperative new intelligent-responsive delivery systems to be developed in order to counteract this limitation.

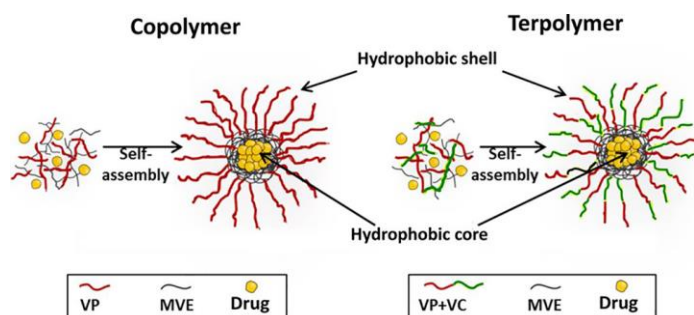
In this sense, polymer therapeutics, and more specifically polymer drugs offer the opportunity to obtain bioactive macromolecules with improved pharmacological properties and can be designed with amphiphilic properties that give rise to the formation of micelles or vesicles through self-assembled mechanisms. These polymeric nano-assemblies have several advantages if compared to other traditional treatments. Particularly, the core of the polymeric NPs can be used to encapsulate hydrophobic drugs, improving their bioavailability, decreasing their toxicity and protecting them from degradation processes.

Patient need addressed: osteo-articular regeneration, skin diseases

Our innovation:

- New family of amphiphilic copolymers and terpolymers that form bioactive polymeric nanoparticles
- This family of copolymers and terpolymers contain an antioxidant agent as a bioactive and hydrophobic component
- This family of copolymers and terpolymers are highly antioxidant and amphiphilic, and form nanoparticles
- These nanoparticles can be used as controlled delivery systems for the administration of bioactive agents with low solubility in physiological conditions (e.g. active substances with analgesic, anti-inflammatory, activating tissue regeneration, antibiotic, antiproliferative, antimicrobial, etc. effects)

Competitive advantages: Good stability in physiological medium. Easily eliminated by the body through the normal metabolic pathway. They can be administered by injection in the area that are required or applied in aqueous dispersions or in hydrophilic gels either topically or locally. Good cytocompatibility.



Market size/ opportunity: Global nanomedicine market expected to reach \$261,063 Million by 2023 (Allied Market Research, Nov. 2, 2017).

Global regenerative medicine market is expected to expand from a value of around EUR 18 billion in 2016 to somewhere in the region of EUR 130 billion by 2025 (Roland Berger Focus, 2017).

Intellectual property

Spanish patent granted ES2735638 (priority date: June 18, 2018)
European patent application, EP3583939A1