Synthesis of a novel biocompatible peptide hydrogel impregnated with titanium oxide nanoparticles, investigation of its biological applications

Roya BINAYMOTLAGH - *Sapienza University of Rome*

Among biomaterials, peptide hydrogels attract many attentions. They are biocompatible, biodegradable, and due to the liquid from of their precursors at room temperature, they are injectable. These features make them good candidate for studying in biomedical applications. The aim of this research is to synthesize peptide-based hydrogels and impregnate them with Titanium oxide /or Titanium oxide decorated with silver nanoparticles (TiO_2@AgNPs) to have the resultant hydrogel/nanoparticles hybrid. The amino acid, fluorenylmethyloxycarbonyl phenyl alanine (Fmoc-Phe) and diphenylalanine (Phe2) are used for the hydrogel synthesis. Green chemical methods have been applied for the synthesis of hydrogel and nanoparticles. Regarding the biological applications, the hydrogel/nanoparticles hybrid can be used in the field of antibacterial materials. Structure, mechanical stability and morphology of this nanohybrid were characterized with different techniques such as FESEM, FTIR, UV-Vis, SAXS, ICP, Rheology measurement, and XPS.