

Hybrid magnetic-polymeric nanoparticles for nano medicine and immune therapy

A platform based on a Nano Carrier system to be employed as a theranostic tool for the treatment of cancer and/or aging-associated neurodegenerative diseases is presented. The theranostic approach (therapy and diagnosis) takes advantage of the possibility to employ nanostructured materials simultaneously as multifunctional platforms for hyperthermic treatment, controlled drug release and imaging/sensing applications.

A multifunctional system based on a hybrid inorganic(magnetic)/organic nano-carrier, superficially decorated with specific targeting moieties (monoclonal antibodies and/or protein-based units for cellular recognition) and loaded with specific anticancer drugs was customized for treatment of pancreatic and head-neck cancer. Preliminary results are presented in this speech.

Recently an other approach has been developed for melanoma and multiple sclerosis :a robust technique to load hybrid nanoparticles into T-lymphocytes still maintaining their viability and functionality unaffected. T-cells were chosen because they can be selected and multiplied to strengthen their cytotoxicity towards tumoral cells and the possibility to mediate the inflammatory processes in the brain. This method implies the preparation of products based on live-cells with the aim of enhancing their therapeutic, diagnostic or preventive effect.