

# 25<sup>th</sup> Nano Congress for Future Advancements

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# Nanopharmaceutics and Advanced Drug Delivery

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### Smart biomimetic nanoparticles: A new platform for nanomedicine

The ever increasing need of more effective and targeted therapies for the treatment of cancer and various degenerative pathologies is pushing material scientists to develop new solutions associating enhanced safety with smart functionality, also permitting the establishment of personalized therapeutic approaches. In this respect, the development and use of nanoparticles is today limited by several factors among which: i) low biodegradability and biocompatibility; ii) toxic by-products; iii) uncontrolled drug release into the bloodstream; iv) limited cell-target specificity and v) low efficiency in crossing biological barriers. In this respect a novel apatite based nanoparticle (NPs) have attracted the attention of scientific community for biological and medical purposes as promising materials in drug or gene delivery, DNA/biomolecules separation, hypothermal treatment of tumours, contrast agents for imaging, and recently in tissue engineering and theranostic applications. Recently, novel biomimetic, fully biodegradable and cytocompatible NPs fabricated by doping hydroxyapatite (HA) with Fe ions (FeHA), avoiding the presence of magnetic secondary phases and coating, were developed and biologically tested as new drug delivery systems. The wide possibility of surface functionalization of apatitic nanoparticles significantly extends the potential to develop smart drug carriers with active or passive ability to cross physiological barriers and to reach relevant organs such as the brain, the lung or the heart.

### Biography

Monica Montesi has obtained her PhD in Cellular and Molecular Biology at the University of Bologna and she has 12 years of expertise in cellular and molecular biology associated to material science for nanotechnology, tissue engineering research and regenerative medicine. She is a scientific coordinator of NanoBioMagnetism Laboratory. She is an author of 40 papers published in international journals, several book chapters and more than 30 congress communications. She has been serving as an Editorial Board Member of international *Journal of Bone and Mineral Metabolism* and Guest Editor of *International Journal of Molecular Sciences*.

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