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Functionalized carbon nanotubes as immunomodulator systems and ultrasound contrast agents

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Carbon nanotubes have been studied for a wide variety of applications included in medicine as drug delivery systems, targetable materials and diagnostic tools. Carbon nanotubes, toxic in their pristine forms, have been functionalized with many different techniques to make them biocompatible. It has been showed the potential use of well functionalized carbon nanotubes (f-CNTs) as ultrasound contrast agents. The interaction of f-CNTs and primary immune cells has been studied and, f-CNTs have been proposed as immunomodulators showing their potential as activators of the immune systems. Moreover, it was recently evaluated the possibility of taking advantage of immunostimolatory properties of f-CNTs against microgravity immune function dysregulation. The results proved that the capacity of f-CNTs to stimulate immune cells have very interesting broad future applications not only in immunotherapy or as vaccine adjuvants, as recently suggested, but also to contrast spaceflight immune cells functionality suppression. Results from different investigations, functionality assays and their potential as theranostic materials will be presented and discussed.

Biography

Lucia Gemma Delogu now is Assistant Professor and Head of the laboratory of Bionanotechnology and Biochemistry at the University of Sassari, Italy. She got her BSc focusing on genetics and the PhD on Biochemistry and Molecular Biology. She was Post Doctoral Fellow at the University of Southern California, USA (2007-2009). She was visiting Researcher at the National Institute of Health of Bethesda (USA) in 2013. She got the title as "Best 200 Italian Talents" from the Italian Ministry of Youth in 2011, she got the "Del Prete: Medicine, biology and nanotechnology Award in 2012" and "the Bedside to Bench & Back Lecture Series Achievement Award" in 2013 at the NIH Bethesda, USA. She is part of the editorial board of Journal of Translational Medicine. Her laboratory focuses on functionalized carbon nanotubes, graphene, superparamagnetic irone oxide nanoparticles and nanocapsules and their interaction with the immune system at the gene and protein level.

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