

# Summer Course in Nanoscience and Nanotechnology

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### ABSTRACT

## Engineered nanomaterials for biomedical imaging and cancer therapy

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The application of nanotechnology to medicine (nanomedicine) has become one of the most promising routes for the targeted diagnosis and treatment of diseases. The small size of nanomaterials, large surface area and high reactivity impart unique physicochemical properties to these materials, in such a way that several therapeutics based on nanomaterials (liposomes, nanoparticles, polymers) have been approved for clinical use in the past few years. However, there are still several limitations that need to be overcome to obtain novel and efficient nanocarriers. Among the different types of nanomaterials, one advantage of using carbon nanotubes is that their inner cavity can be filled with a chosen payload while the outer surface can be modified with selected moieties. The encapsulation of materials allows ultrasensitive imaging and even mapping of subcellular organelles, whereas functionalization of the external walls of these filled carbon nanotubes allows targeting of cancer cells. In this talk we will present recent advances on the development of carbon nanomaterials for biomedical imaging and cancer therapy.