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Nanostructured ceramics for bone cancer therapy

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Bone cancer, is among the most invasive tumors with lowest survival probability. In this case, following cancerous bone excision, concealing the bone tissue loss is necessary and to this aim materials designed for bone replacement are requested. Moreover, a subsequent antitumor treatment needs to be carried out to avoid recurrence. This review talk will focus, three particular strategies, all of them aimed to address the therapeutic treatment to the tumour site: 1. The employment of ceramic nanoparticles as targeted anticancer drug carriers to be exploited as injectable devices. Particularly the speech will include calcium phosphate and silica-based materials intended for hosting and carrying anticancer molecules, due to their particular surface nanostructure. 2. the use of those nanomaterials that we can define as "intrinsically anticancer" because they possess some properties that can activate specific cellular mechanism, and specifically, they can act as nano-thermoactuators for hyperthermia or as small sources of radiation. 3. the use of nanobioceramics as bone fillers with anticancer function to be implanted into the affected piece of bone. This talk section will illustrate the combination of both the above described approaches: magnetic phases are included into implantable bioceramics in order to obtain composites that can be designed for skeletal reinforce and contemporarily act in order to prevent metastases after tumour resection. Starting from nanostructured bioceramics composition and functional properties, the results presented in this talk will describe the mechanism through which they may be adjuvant in the multifaceted curative techniques that must be adopted against bone tumours.

Biography

Barbara Palazzo has completed her PhD in Chemistry in 2006 from Bologna University and Postdoctoral Studies from Oriental Piedmont University, Medical Science Department. She is responsible for the local research unit of Ghimas S.p.A in the High Tech District of Lecce. She is author of more than 35 papers in peer review journals. Her research is focused on biomimetic inorganic and polymeric materials intended for the repair of defects in the maxilla-facial site or in the osteochondral unit. She investigates multifunctional nanomaterials for the controlled delivery of chemotherapeutic agents, above all for the treatment of bone tumors and metastasis.

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