



Consiglio Nazionale
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ISTITUTO PER L'ENDOCRINOLOGIA
E L'ONCOLOGIA SPERIMENTALE
"G. SALVATORE"
2nd UNIT

Seminar

28nd September 2023, 14:30h CEST

Maria Grazia Raucci

IPCB- CNR, Pozzuoli

**A theragenerative
bionanomaterial for
bone cancer therapy
and regeneration**

Host: Domenico Russo (domenico.russo@cnr.it)

Conference Room, CNR, P. Castellino Campus



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Abstract: For several decades, cancer has been studied as a dangerto human life. Despite its shortcomings—side effects, limited effectiveness, poor targeting, and so on—conventional medicines have been widely used due to a lack of viable alternatives. The introduction of nanotechnology into medicine has opened new possibilities and given effective cancer treatment alternatives. Because of their large surface area, photoresponsivity, and electrical conductivity, 2D nanomaterials have lately received a lot of interest in nanomedicine. Black phosphorus (BP) is a 2D nanomaterial consists of multiple layers weakly bonded together through van der Waals forces; unique structure of BP makes it an appropriate drug/gene carrier, PTT/PDT, and imaging agent. One of the outstanding aspects of BP in comparison to other 2D materials is its selective anticancer action without the assistance of NIR or any other drugs, making BP stand out among a wide range of nanomaterials. BP nanosheet is also defined as theragenerativebionanomaterial for its multifunctionalnatureto induce therapy followed by repairing/regenerating the tissue/organ. The lectureaims to provide an overview of the design and development of BP-based nanosheets and nanocomposites and the therapeutic and regenerative effects on cancer and healthy cells. In particular, the antitumor effect of bare BP nanomaterials and nanocomposites was evaluated *in vitro* on bone, breast and prostate carcinoma cells; meanwhile, the regenerative behaviors of the nanocomposites were tested by *in vitro* models with healthy osteoblasts and human mesenchymal stem cells.

Biography: Dr. Maria Grazia Raucci is a Senior Research Scientist at the Institute of Polymers, Composites and Biomaterials (IPCB-CNR). She received the M.Sc. degree in Biology Science (2001) at Second University of Naples and the Ph.D in Chemical Engineering of Materials and Production – _Biomaterials (2005) at University of Naples “Federico II” focusing the research activity on the development on new biomaterials for tissue engineering and regenerative medicine. During her PhD she was a visiting student at Guy’s, King’s and St Thomas’ Dental Institute-Department of Dental Biomaterials Science in London working on the biocompatibility of antibacterial materials for bone and dental tissues applications. In the 2011, she became Permanent Research Scientist at IPCB (former IMCB) and since 2014 is Scientific Responsible of Tissue Engineering & Cell Culture Laboratory of IPCB SS Napoli/Portici and since 2022 she is Scientific officer of IPCB unit at University of Salento. Qualified Associate Professor in Bioengineering (sc 09/G2) and in Material Science and Technology (SSD ING-IND/22, sc 09/D1). In addition to the early teaching and research activities, Dr. Maria Grazia Raucci has been abroad in several institutions: (i) visiting scientist at University of Brighton in the synthesis of peptides and semi-dendrimers for material bioactivation; (ii) visiting scientist, within CNR Short Term Mobility Program, at Universidade Federal Do Rio Grande Do Sul in Porto Alegre (Brazil) where she developed innovative antibacterial and antibiofilm materials by using ionic liquids which allow to overcome drawbacks related to antibiotic-resistance and the use of nanoparticles.

Dr. Raucci has been scientific coordinator of Horizon 2020 MSCA-RISE project performing part of the research activity at NERC Institute of Sichuan University. Thanks to the well-established experience from design and development of materials to *in vitro* biological study, she is involved in several national and European projects as NANORESTART and MEFISTO, and some bilateral cooperation, as Principal Investigator, with CINVESTAV (Mexico) and ANSA (Azerbaijan).

She has been awarded, as national coordinator of PRIN program and is coordinating the research tasks for CIRO Project—Campania Imaging Infrastructure for Research in Oncology, POR CAMPANIA FESR 2014/2020 and task leader for National Center for Gene Therapy and Drugs based on RNA Technology.

Since 2021, she is member of the European Society for Biomaterials Council acting as Liaison Officer of National Affiliated Societies. She is also Auditor of Società Italiana per i Biomateriali (SIB) Council.

In addition to her role as chair of several conference sessions, national and international workshops and for the National Conference on Biomaterials - SIB2021, she published over 80 papers on peer-review journals, 6 book chapters and about 120 abstracts for national and international conferences and 20 invited lectures.