3 March 2021, 11:30 – *Online seminar*

Cell culture and plasma processes on cells @ NANOTEC-Bari

Multidisciplinary studies to fight cancer: from Selective treatment to the Immunological Cell Death approach

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Plasma technologies were initially applied to the biomedical field by means of their ability to modify the materials surface, without influencing their bulk properties. In the last 15 years cold plasma has been applied directly to cells and tissues or on liquid involved in the bio-medical field. This talk will address the new field of Plasma Medicine and Plasma Pharmacy, showing the importance that this approach can give to the multidisciplinary studies aimed at fighting cancer in a selective way, i.e. without having an harmful effect on "normal" cells. It will be highlighted that this selective anticancer effect depends mainly on the ability to tailor the quantity and quality of reactive Oxygen and Nitrogen species (ROS and RNS). Finally, it will be shown how both direct and indirect plasma processes can be a fantastic tool to use the immune system to recognize and attack cancer cells, giving an important and innovative tool to the very fruitful approach of Immunotherapy, considered the future of a successful cancer fight.

Keywords: plasma medicine, plasma pharmacy, in vitro cell culture, immunological cell death.

Short Bio: Roberto Gristina took a PhD in Cellular and Developmental Biology in Palermo in 1992, **studying the mammalian nervous system**, by means of an *in vitro* **cell culture approach**. He became CNR researcher in Bari December 2001 after joining the Riccardo d'Agostino plasma process group, where he discovered that plasma is a name that is not peculiar to the human blood, but that **many different plasma processes application** can be applied to the **biomedical field**. At the beginning he started with the **biological characterization of materials modified by means of plasma processes**. Then, about ten years ago, he applied the assays, used to characterize bio-materials, **to cells directly exposed to plasma or to liquid treated by plasma**.

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