



PREmedCAP and **NECTAR** two scientific PRIN 2022 (PNRR) projects to develop effective plasma medicine approaches in cancer treatment

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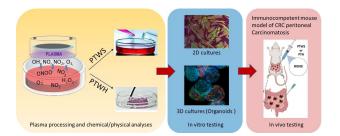
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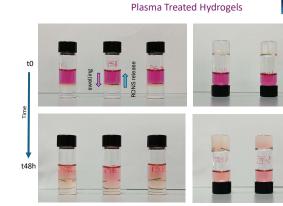
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The PREmedCAP project aims to create pharmacological products in the form of liquids or hydrogels, using plasma technology, as an innovative alternative to chemotherapy against colorectal cancer (CRC). The products thus created will be conceived as drug delivery systems of RONS species to be used in both in vitro and in vivo models. In this research area, the fellow will participate in the study, synthesis and in vitro application of the pharmacological products described above. Particular attention will be paid to the synthesis and chemical-physical characterization of the devices through: development of processes via plasma and synthesis of hydrogels, UV-Vis and fluorescence spectrophotometry for the quantification of RONS species, LC-MS for the identification of organic molecules contained in liquids and hydrogels and their reaction products, study of the rheological properties of hydrogels, study of the release kinetics of RONS.





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RESEARCH IN PROGRESS



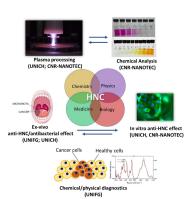
Needs from the Group & **Collaboration Interests on** Specific Topics

physical characterization of hydrogels (i.e. DSC, cryoTEM, swellingTSC, rheologyv, QCM-D, micro-CT)





The worldwide incidence of head and neck cancer (HNC) exceeds half a million cases annually, and up to half of the patients with HNC present with advanced disease. Surgical resection remains the mainstay of treatment for many HNCs, although radiotherapy, hemotherapy, targeted therapy, and immunotherapy might contribute to an individual patient's treatment plan. Irrespective of which modality is chosen, the disease prognosis remains suboptimal, especially for higherstaging tumors. NECTAR project proposes to study indirect CAP treatment of liquids - named Plasma Treated Water Solutions (PTWS) - enriched with biomolecules that have an ambitious bifunctional effect: efficacy against cancer cells and pathogenic bacteria without altering normal functionalities of healthy cells. The research proposed in NECTAR is at the crossroads of different disciplines and involves researchers working in the fields of chemistry, biology, physics, and medicine. The innovative character of the proposed research can be translated into meaningful impacts in the lives of people affected by HNC.



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-3D cell culture; -immunostimulation characterization; in-vivo characterization



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