Lines of research:

1) Glioblastoma (GBM) is the most frequent primary brain tumor in adults, with a very aggressive course and few therapeutic options. In recent years it has been identified a population of tumor cells with stem cell properties, referred to as glioblastoma stem cells (GSCs), that play a crucial role in tumor initiation and maintenance. Studies concerning the interactions between tumor cells and the extracellular environment highlighted the possibility of identifying molecules that may represent interesting therapeutic targets for tumor cell proliferation and motility control. The integrin receptors have been identified as key regulators of different cellular processes related to tumoral growth, like cell adhesion and migration, cell proliferation and neo-angiogenesis. In our lab the anti-infiltrative features of small molecule integrin antagonists are studied using human GSC as cellular model in order to find new tools to limit GMB brain infiltration. In addition, ongoing experiments are devoted to characterize the and morphological and functional features of microvesicles (MV) released by astrocytes to gain new insights in enhancing CSC malignity and ability to spread to new sites and establishing the tumoral niche.

2) Spheres from cancer cells in a 3D dynamic culture system: an approach to study metastatic infiltration mechanisms. Metastatic spread is mainly sustained by cancer stem cell (CSCs), a subpopulation of cancer cells that still retains stemness features. In our lab we are trying to reproduce the adhesion and infiltration processes of CSC, obtained from different solid tumors, by using a 3D dynamic cell culture system. We have isolated in vitro a population of 3D spheroids displaying CSC-like features from a breast carcinoma cell line (MCF-7) and from lung carcinoma cell line (A549). These putative metastatic cells will be investigated for their ability to adhere and grow on a layer of fibroblasts or osteoblasts previously inglobated in a 3D polystyrene scaffold. The ability of selected compounds, such as integrins antagonists, will be investigated for their potency in inhibiting CSC adhesion and growth thus implementing a novel in vitro model as promising approach in studying metastatic infiltration in vitro.

3) Study of innovative formulations developed by the Biopharmaceutics and Formulation Development Laboratory in in vivo murine model of 3°grade cutaneous burn for the treatment of chronic wounds. The formulations tested are able to deliver hemoderivatives in association with anti-infective/antioxidant agents to modulate and shorten chronic wounds recovery.

Other informations:[selected publications (max 5) - website]


