MELANOMA

Background

Melanoma is a malignant tumour of melanocytes. Melanoma is less common than other skin cancers, however it is much more dangerous if it is not found in the early stages. It causes the majority (75%) of deaths related to skin cancer. The treatment includes surgical removal of the tumour.

Pathology Model

2D culture of melanoma cells will be cultured in vitro and analysed by FACS in order to assess cancer stem cells content (CSC) (CD133 positive cells), Moreover, cells will be monitored for inflammatory cytokine production as well as selected expression of target genes. A transcriptomics analysis of challenged cells can also be taken into consideration.

Moreover, both primary and secondary spheroid formation (ie. Cultrex® 3-D Spheroid Assay) and invasion assay (ie. Cultrex® 3-D Spheroid Cell Invasion Assay) to mimic in vivo 3D conditions will be taken into consideration. In particular, the interaction between cancer cells and niche cells from the microenvironment (fibroblasts, endothelium etc.) will be deeply investigated, in both 2D and 3D cultures.

For what concerns the 2D, cells will be microfluidically connected on MicroTISSUE, an innovative multiparametric platform which enables to dissect the contribution of single cells in the microenvironment. For what concerns 3D, cells will be included in a matrix mimicking the in vivo extracellular matrix (ECM) in order to evaluate the capability of the cells to degrade ECM and migrate in response to microenvironment stimuli.

Readouts

Cocultures of cancer cells with mesenchymal stem cells (MSC) will be taken into consideration in order to evaluate the effect of MSC on tumor progression, metastatic potential and CSC proliferation.