# Harnessing NK cells and Graphene Oxide Nanoparticles for Pancreatic Ductal Adenocarcinoma Immunotherapy

Pancreatic cancer, and in particular pancreatic adenocarcinoma (PDAC), is on the way of becoming one of the most frequent solid cancers worldwide. PDAC is a challenging cancer to treat; radiotherapy and chemotherapy are inefficient treatments in most of cases. In the last decade, immunotherapies have become major breakthroughs in the fight against cancer. However, due to its intra-tumor heterogeneity and a marked desmoplastic stroma contributing to a hostile tumor microenvironment (TME) exhausting the immune system, there is a limited efficacy of current immunotherapies against PDAC. Therefore, robust pre-clinical models are urgently needed to understand the impact of TME on immune cells and support the potential of novel immunotherapeutic approaches against PDAC. The Medical University of Gdansk (MUG) has established PDAC organoids from resected tumor samples or biopsies from patients and demonstrated the potential of Graphen Oxide (GO) nanoparticles with infrared irradiation against PDAC. The Luxembourg Institute of Health (LIH) has set-up a PDAC xenograft model in humanized mice having functional Natural Killer (NK) cells, and generated two immunotherapeutics inducing and engaging cytotoxic NK cells to PDAC cells. The main goal of this collaborative project between the MUG and the LIH is to develop cutting-edge PDAC organoids and an orthotopic pancreatic Patient Derived-Xenograft (PDX) model to evaluate and validate NK-cell based and GO nanoparticle therapies against PDAC.