María José Alonso Fernández

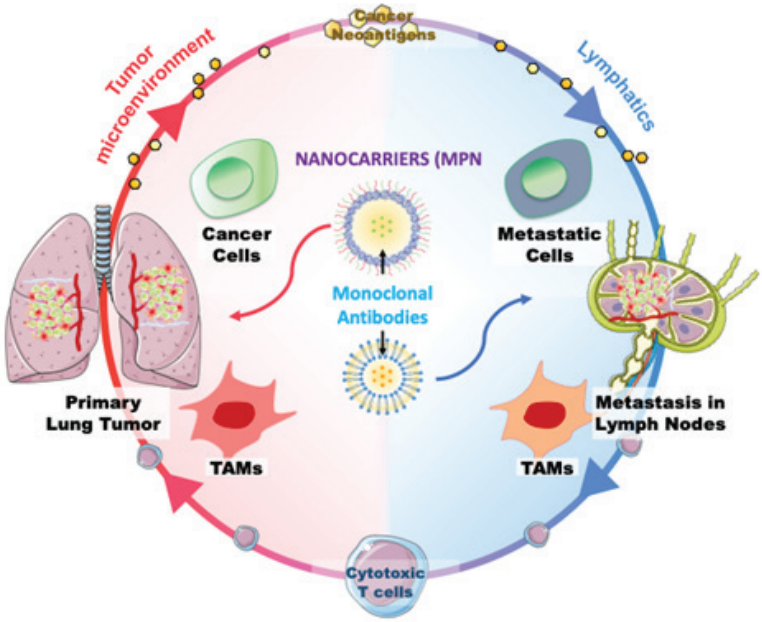
2^2-INTRATARGET

Nanocarriers to deliver antibodies towards intracellular targets in cancer cells/TAMs at primary/metastatic sites

Coordinator:
María José Alonso Fernández, IDIS, Santiago de Compostela, Spain

Contact:
mariaj.alonso@usc.es

Partners:
Paola Allavena, Humanitas Clinical and Research Center (ICH)
Alfonso Calvo, University of Navarra (UNAV)
Ruth Schmid, SINTEF Industry
Jean-Christophe Rain, HYBRIGENICS SERVICES (HYBRI)



Antibody-based anticancer therapies (targeted therapies and immunotherapies), have represented a key breakthrough in the treatment of cancer. Despite their recognized potential, marketed antibodies suffer of sub-optimal biodistribution at both, tissue (primary tumor site and metastatic niches) and cellular level (cancer cells and immune cells). The result of this is a limited performance and significant side effects in many patients. Furthermore, these antibodies are only able to reach extracellular receptors, while a significant number of drug targets located at the intracellular level remain still undruggable. Nanotechnology offers a great opportunity to make these targets druggable by facilitating the intracellular delivery of antibodies in the target tissues. The objective of this proposal, is to address these challenges by engineering Multifunctional Polymeric Nanocarriers (MPNs) with the capacity to deliver monoclonal antibodies (mAb) and related molecules (nanobodies, minibodies) to intracellular targets, localized either in cancer cells or immune cells (i.e. tumor associated macrophages, TAMs), at two different tissue compartments, the primary tumor, i.e. lung tumor, or its metastatic niche, i.e. lymphatic nodes. The combination of these potential nanomedicine candidates is conceived as a multi-focal strategy that may represent the next milestone in the treatment of cancers difficult to treat such as lung cancer.