Aline Risson

PhD Student at UNAV

Aline is integrated in the group of Dr. Pedro Berraondo, principal researcher of Cytokine-based Therapies Laboratory, within the Immunology and Immunotherapy Program at CIMA, Center for Applied Medical Research of the UNAV.

Research

Bifunctional immunostimulatory molecule screening platform for personalized renal cancer treatment.

Research objective: to develop a platform for the high-throughput screeening of bifunctional immunostimulatory drugs, in order to identify the best combinations and accelerate the translation of candidate molecules to clinical trials.

Abstract:

Immune checkpoint-based cancer immunotherapy has revolutionized cancer treatment, but this treatment remains ineffective for a great number of patients. One of the strategies to improve cancer immunotherapy is the use of bifunctional immunostimulatory molecules such as bispecific antibodies or immunocytokines. These molecules offer the possibility of combining two targets and possibly two different mechanisms of action in a single agent, thereby improving tumor specificity and reducing systemic side effects. However, the clinical development of bifunctional immunostimulatory molecules is hampered by the complexity of their mechanism of action and the heterogeneity of the tumor microenvironment. Rational selection of combinatory molecules is therefore difficult and inefficient. In this sense, strategies are needed to generate new drugs that can be adapted to the intense pace of clinical research in cancer immunotherapy and to the characteristics of each patient, moving towards personalized immunotherapy.

The objective of this project is to develop a platform for the discovery of synergistic immunotherapy combinations taking advantage of the modified mRNA techonology. To this end, we will screen the antitumoral effect of several synergistic combinations in vitro using patient-derived tumor samples and in vivo in renal cancer murine models. The bifunctional molecules will be generated in vitro by transfection of plasmids into 293T cells and in vivo by hydrodynamic administration in mouse models. To develop therapies that can be quickly transferred to the clinic, the best candidates identified in the screening process will be expressed by mRNAs encapsulated in lipid nanoparticles and their antitumor efficacy and mechanism of action will be evaluated in murine tumor models. Ultimately, this project may contribute to the development process of immunostimulatory drugs for cancer, enabling the efficient selection of the best bifunctional combination and accelerating the translation of candidate molecules into clinical trials.

Aline is from Curitba, Brazil.

She has studied in Brazil, Spain and Ireland.

- BSc in Biomedicine
- MSc in Translational Medicine
- Health Multiprofessional Residency Program

She has worked as a clinical research associate in international multicenter trials and also as a research technician in a biotech startup for RNA-based therapies.

Those experiences have reinforced her trainning in the health area and her commitment to research.

'I felt the need to connect theory with practical patient care. During my residency program in Child and Adolescent Health at the largest Brazilian pediatric hospital, I built a multidisciplinary view of the health sector: from laboratory diagnostics to patient prognosis; from sample biobanking to clinical trials and pharmacovigilance analysis. It was when I realized that knowlegde becomes health and that, through research, I could make a difference in patient outcomes'.

'I want to employ my multidisciplinary background in the full bench-to-bedside route of immunotherapy development, as its focus spans from basic mechanistic to therapeutic research. I am enthusiastic about working with the complexity and adaptability of tumors and immunity'.