Our laboratory aims to understand how the microenvironment impacts metastatic behaviour. Most of the efforts in the past focused on defining intrinsic factors involved in tumour progression and metastasis. However, our interpretation of tumour evolution and metastasis has shifted and currently it is widely accepted that extrinsic factors are actively involved in cancer progression. To tackle this question, our laboratory is using melanoma models to define the role of secreted exosomes in cancer progression. To understand how obesity induces systemic changes favouring metastasis (e.g., increased vascular permeability, platelet recruitment and immune cell impairment). Furthermore, we are visualizing pre-metastatic niches in vivo by intravital imaging, in collaboration with the CNIO Confocal Microscopy Unit, to understand how breast tumour cells home in metastatic lungs in normal and high fat diet-fed mice, and the mechanisms underlying this process.

**OBVERVIEW**

“Our interpretation of how the tumour microenvironment impacts on cancer progression has changed over the past few years. Now we know that the surrounding microenvironment is one of the driving forces of metastasis.”

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**PUBLICATIONS**


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**RESEARCH HIGHLIGHTS**

**Novel strategies for diagnosis and treatment of metastatic melanoma**

Liquid biopsies provide information about cancers in a non-invasive way. In this context, we explore the use of exosomes circulating in biofluids from melanoma patients for minimal residual disease detection and treatment monitoring. Since an important number of patients are refractory to therapy, we additionally study the tumour-immune system cross-talk to find new therapeutic strategies to defeat melanoma metastasis focused on restoring the sensitivity to targeted therapies and/or anti-tumour immunity. We are also interested in the analysis of matrix remodelling processes and microenvironmental factors that influence melanoma progression and could open avenues for new treatment strategies.

**How does obesity impact metastasis?**

Obesity is a chronic inflammatory condition associated with enhanced cancer incidence and mortality. In fact, obesity is thought to be responsible for up to 20% of cancer-related deaths in adults. We are currently analysing how obesity induces systemic changes favouring metastasis (e.g., increased vascular permeability, platelet recruitment and immune cell impairment). Furthermore, we are visualizing pre-metastatic niches in vivo by intravital imaging, in collaboration with the CNIO Confocal Microscopy Unit, to understand how breast tumour cells home in metastatic lungs in normal and high fat diet-fed mice, and the mechanisms underlying this process.

**Defining novel targets in rare diseases**

In this setting we are investigating how lymph node stroma dysregulation affects the tightly controlled physiology of immune cell populations and gives rise to lymphoproliferative disorders. Finally, we are analysing novel therapeutic targets in malignant peripheral nerve sheath tumours (MPNSTs). We are currently testing treatment strategies combining FDA-approved drugs and anti-angiogenic antibodies to improve therapeutic efficacy in MPNSTs.