MATWIN
MATURATION & ACCELERATING TRANSLATION **WITH INDUSTRY**

TECHNOLOGY OFFER

SUPPORTING INNOVATION AND TECHNOLOGY TRANSFER IN ONCOLOGY

THERAPY

ExoPredict
Circulating HSP70-exosomes as cancer biomarker

CONTEXT & BACKGROUND

The notion of cancer detection by liquid biopsy is a new concept; indeed, many companies are also developing blood-based tests to cancer diagnosis or monitor response to therapy. Many different tumor markers have been characterized. No “universal” tumor marker that can detect any type of cancer has been found. There are some limitations to the use of tumor markers. A major advance for cancer diagnosis has been the detection circulating tumor cells (CTCs) in the blood. However, this approach suffers from important limitations (rare events: one circulating tumor cell/109 normal blood cells; the overexpression of EpCAM does not necessarily correlate with metastasis growth). In this concept, extracellular nanovesicle notably exosome secrete by all cells opens future prospects for the medicine personalized by the liquid biopsy. These circulating vesicles are dynamic, evolve with the disease progression and a single cancer cell can release hundreds of exosomes1. We have shown that exosomes released by tumoral cells express in their membrane a specific protein (called here HSP70-exosome) but exosomes released by “normal cells” do not 2,3. Our results suggest that HSP70-exosome is a universal cancer biomarker. We have develop, an innovative technique, to robustly capture HSP70-exosomes from blood/urine samples2. We have set the proof of principle in small cohort that HSP70-exosomes can be quantify tumor-derived exosomes in human samples. To date, a clinical trial underway has demonstrated the technical feasibility of our concept. So, our objective is expand clinical data to prove that HSP70-exosome can be used as biomarker that predict clinical outcome. This project offers new hope for an earlier and adapted care of the patient and therefore a decrease in cancer mortality rates.

Bibliography:
1. Peinado et al. Melanoma Exosomes Educate Bone Marrow Progenitor Cells toward a pro-Metastatic Phenotype through MET. Nature Medicine 18(6): 883–891 (2012). 2. Gobbo et al. Restoring Anticancer Immune Response by Targeting Tumor-Derived Exosomes with a HSP70 Peptide Aptamer. Journal of the National Cancer Institute 1082016 (2011). 3. Chalmin et al. Membrane-Associated Hsp72 from Tumor-Derived Exosomes Mediates STAT3-Dependent Immunosuppressive Function of Mouse and Human Myeloid-Derived Suppressor Cells. The Journal of Clinical Investigation 120(2): 457–471(2010).

INNOVATIVE COMPONENT & TECHNOLOGY

Biomarker that predict clinical outcome
Non-invasive approach
Minimal pain /risk

OBJECTIVES

Demonstrate that HSP70-exosomes can be used to adapted patient care.

DEVELOPMENT & MATURATION STAGE

TRL 5-6
We are working on clinical data consolidation proving that HSP70-exosome may be a biomarker of efficacy for immune checkpoint inhibitors :
- prove robustness and reproductibility
- confirmation into a large human cohort of the use of HSP70-exosome has has biomarker to immunotherapy efficacy
- compare to standard (lite)

SCOPE

Biomarkers in Oncology

KEYWORDS

personalized medicine, biopsy liquid, exosomes, HSP70, predict therapy efficacy

TARGET POPULATION

All patient with a cancer

TARGET PROFILE

NA

STRENGHTS & COMPETITIVE ADVANTAGES

Innovate approach (science and technology)/ biopsy liquid

INDUSTRIAL APPLICATIONS & OPPORTUNITIES

Monitoring the effectiveness of molecules in development
Looking for industrial partnerships to access large human sample (retro-prospective study)

INTELLECTUAL PROPERTY & PATIENT CO-OWNER(S)

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Owners : Burgundy University and CGFL

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