

**Comprehensive analysis of the immune system  
through translational clinical research**

**1-PRESENTATION**

The **GRIC « Clinical Research in Immunology Facility»** is an autonomous, self-financed structure providing support for the development of translational research programs relying on the biological evaluation of immune parameters in patients. This structure provides to Bordeaux hospitals, the university community, research groups, biotech- and pharmaceutical- companies (local and international) access to knowledgeable expertise, “state of the art” equipments, essential techniques and fosters tight collaboration between clinicians, biologists and researchers. This context of transversality and multidisciplinary was recognized and accredited by the SIRIC-BRIO, as a platform partner.

Created in 2009, the clinical research facility in Immunology is integrated within the Immunology and Immunogenic section (Head Pr. Patrick Blanco, MD, Ph.D.). This facility is directed by Dr. Isabelle Pellegrin MD. Ph.D., supervised by a research engineer and technically operated by a full-time technician.

**This structure works in close collaboration with** the Biology and Pathology Pole, The “Bordeaux Biothèques Santé” (BBS) biobank to promote and ease the process for all Translational research projects, The CHU clinical research and Innovation services, The SIRIC-BRIO, Different CNRS and INSERM units including ImmunoConcEpT and other University core facilities.

The GRIC guides and evaluates any health-related research projects: internal promotion (Bordeaux University Hospital, Bordeaux University), external academic promotion and industrial promotion.

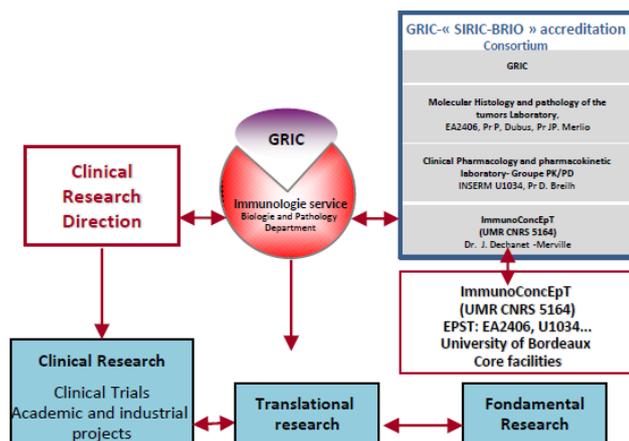
**2- THE I<sup>3</sup> AXIS**

The **GRIC** is actively developing the Innovation in Immunomonitoring and Immunothérapie (I<sup>3</sup>) axis.

In Health research project, Immunomonitoring approach represent a rational follow up of any immunomodulating therapies in Cancer, inflammatory or autoimmune disorders. The data obtained in those studies will be used to define personalize medicine: validation of predictive and/ or prognostic biomarkers of biotherapy responses, analysis of the immune status before treatment and the consequences of these treatments.

**This structure works in close collaboration with** 1) The cytometry facility hosted by SFR TransBioMed and UMR-TBM-CORE 2) The PCR platform facility hosted by SFR TransBioMed; 3) The “Bordeaux Biothèques Santé” (BBS) biobank 4) Different CNRS and INSERM units including ImmunoConcEpT 5) the histology and molecular pathology department (EA2406, Pr P. Dubus and JP. Merlio), 6) The Pharmacokinetic and clinical pharmacology laboratory (PK/PD group, INSERM U1034, Pr D. Breilh), to develop this I<sup>3</sup> axis and make it accessible to all regional and national research providers.

The therapeutic revolution by the immunological "checkpoint" inhibitors, strategic cancer treatments has made it possible to considerably revisit immunotherapy in oncology in particular and opens a new field of research.



### 3- SERVICE DESCRIPTION

The GRIC offers analytical and/or functional assessment of the immune system components and markers for patients included in health research projects (clinical research, translational, fundamental, and epidemiological), at 4 levels

- Molecular (Nanostring)
- Cellular (Flow cytometry phenotyping)
- Protein (Mesoscale Discovery)
- Functional (cell culture, proliferation assays)

Molecular Analysis		
<p><b>Nanostring technology</b></p>  <p>nCounter® Dx Analysis System with <b>FLEX</b> FOR CLINICAL APPLICATIONS Flexible platform used to translate oncology signatures from research to the clinic.</p>	<p><b>Description</b></p>	<p>The Nanostring technology is an innovative tool in the area of translational research and molecular diagnostics. The nCounter platform is a complete solution for digitally detecting and counting large sets of molecules; gene expression analysis of up to 800 genes simultaneously in purified RNA, cell lysates or FFPE tissue and proteins, on the single cell analysis ("single cell"), miRNA, RNA/protein profiling, chromatin test ("ChIPString Assays") and fusion genes. The nCounter system is uniquely positioned to support translational research because it provides more reproducible results than methods requiring amplification, and generates high-quality data from the difficult sample type common in clinical research.</p> <p>The proposed panels allow for the molecular analysis of specific immune markers associated with innate and adaptive immunity. Specific panels have also been developed to study tumor occurrence and progression- <b>The NanoString® technology is now recognized in molecular oncology as "gold standard" for the study of gene expression by its robustness, versatility and analytical performance.</b></p>
	<p><b>Application</b></p>	<p>ARNm, protéines, miRNA, CNV, Fusion de gènes, molecular diagnostics</p>
Cellular Analysis		
<p><b>BD LSRFortessa® X-20 Beckman Coulter NAVIOS</b></p> 	<p><b>Description</b></p>	<p>Flow cytometry techniques are methods of multi-individual cell analysis which allows for the detection and the precise phenotyping of multiple cell types. These cytometers Navios and BD LSRFortessa™ X20 are configured with three lasers for the detection of colors 10 and 20 respectively, to define accurately the presence of a given cell type, activation status and function. Cytometer LSRFortessa™ X20 also has the advantage of facilitating the detection of rare cells.</p>
	<p><b>Application</b></p>	<p>The GRIC has validated numerous panels in whole blood or PBMCs to follow most immune cell populations qualitatively and quantitatively: LB (memory, plasmocytes), LT (Tfh, Th, Treg, γδT, Teff, Tmem...), NK, NKT, iNKT, CD, MAIT, Granulocytes and PMN, MDSC... Lymphocyte activation and migration profile</p>
Proteomic		
<p><b>Meso Scale Discovery® / Luminex 200</b></p> 	<p><b>Description</b></p>	<p>The analysis of protein secretion is an essential step for a comprehensive analysis of the immune response. Cytokines, chemokines, and other markers constitute the cellular communication language. In the context of studying the state of activation or suppression of the immune system, this equipment is particularly relevant and complete the panel of tools already used on the GRIC platform. It is particularly well adapted to the detection of protein present in plasma, serum or cell culture supernatant, and only requires a small sample volume. This technology in multiplex enables testing different analytes simultaneously.</p>
	<p><b>Application</b></p>	<p>Measurement of protein concentration in serum, plasma, cell culture supernatant and other biological fluids.</p>

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