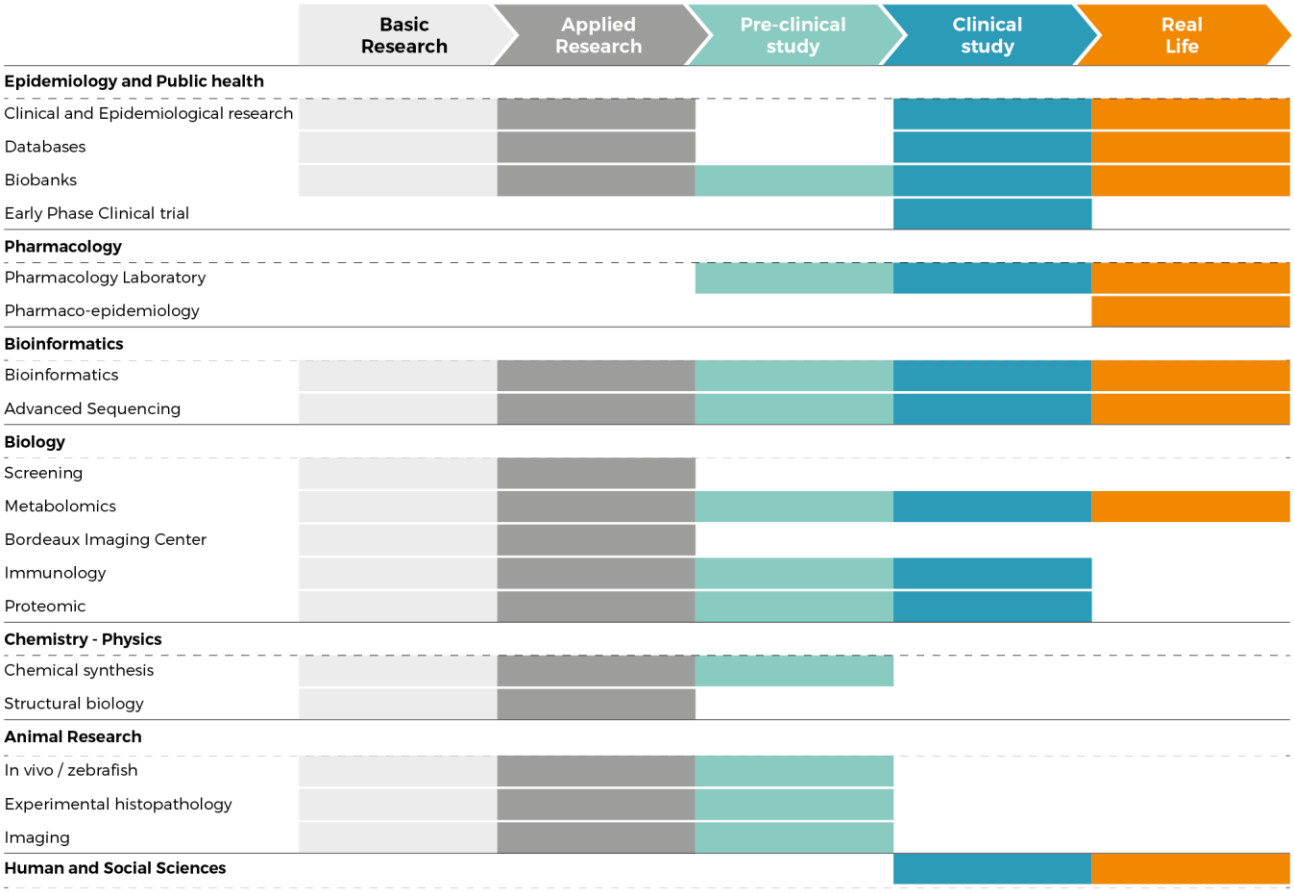
The SIRIC shared resources and facilities

BRIO benefits from access to a wide range of high quality research services provided by dedicated Science Technology Platforms across our sites. Technology Platforms allow access to state-of-the-art equipment, but also technical advice and instruction in correct and effective use of the equipment. Scheme (below) showed our platforms across the research value chain.



For this renewal, our research centred on existing platforms and the creation or direct funding to new structure is not anticipated. The programmes have planned the appropriate budget to secure their platform utilisation. However, a Call for Proposal aiming to fund unplanned services to BRIO platforms will be drawn and carried out every year to provide support when needed. As the technology develops and appears, this call for proposal is also a mean to support emergence of new competencies. Two deliverables are pendent on the WP:

- 1: Launch of a call for proposals dedicated to fund platform integration to projects (improved from BRIO1)
- 2: Report on evaluation of BRIO call for proposals for platforms

. Epidemiology and Public health

Clinical and Epidemiological research

BRIO can count on the two Hospital dedicated structures for clinical research and clinical epidemiology UREC (Institut Bergonié, *Unité de recherche épidémiogique et Clinique* led by Prof. Simone Mathoulin-Pélissier) and USMR (CHU de Bordeaux, *Unité de Soutien Méthodologique à la Recherche Clinique et Epidémiologique* led by Prof. Rodolphe Thiebault). Those structures are in charge of:

- The methodological support for the development of clinical trials (protocol elaboration, data analysis, reporting),

- Operational management of clinical trials,
- Development of its own research projects in epidemiology and biostatistics.

Both structures have the ISO 9001 certification for clinical trials. In 2016, UREC permitted the inclusion of 1,850 patients and coordinated 55 Clinical trials (including 10 PHRC). USMR, permitted the inclusion of 4,799 patients and the coordination of 39 clinical trials.

In addition, BRIO can count on the cancer axis of the CIC-EC (Clinical investigation Centre in Clinical Epidemiology), a multi-institution structure dedicated to the transfer between clinical and epidemiological research and created for the realisation of cohorts, large epidemiological investigations and clinical trials. It provides researchers, doctors and caregivers in Bordeaux:

- a recognised team and know-how,
- logistical support,
- computer platforms and databases,
- coordinated financial and material resources.

It is based on a consortium of academic research laboratories (Inserm) and academics, located at the University of Bordeaux campus. It promotes the interface between research, clinical practice and teaching.

Since the end of 2007, a strong focus on cancer has developed, particularly due to the presence of the Cancer Clinical Trials Data Centre (CTD labeled by INCa), four Cancer Registries, centre of the biological resources of the liver, the European sarcoma database, three cohorts for different cancers. The projects are both initiation from clinicians and methodological collaborations to answer clinical questions.

Databases

Out of the 9 databases supported by the INCa in the 2011/2012 call for proposal, three are either led by Bordeaux researchers and/or managed by Bordeaux Institutes. This fact illustrates the concentration of skills and capacities in database conception and management present in the Bordeaux region and now part of BRIO.

In parallel to the three INCa-supported databases (Sarcoma, Liver and Kidney), each research programme based some of their work around these databases:

Name (BRIO Leader)	Funding (Scope)	Description
NetSarc – ResOs– NetSarc – Conticabase – ConticaGist and ATG Sarc (J.M. Coindre)	INCa National, 6 centres	The Sarcoma BCB allows the structuration and improvement of care as well as simplifies the access to clinical and biological data as well as to tumour bank. Allowing enhancement and rapid implementation of standard of care to improve patient outcome.
UroCCR: ***Réseau Français de Recherche sur le Cancer du Rein*** (J.C. Bernhard)	INCa National, 14 centres	The objective is to develop a national multidisciplinary health network around care, treatment and translational research in kidney Cancer.
BC BANCO (P. Soubeyran)	BRIO funded	Based on PREPARE clinical trial, this database aims to collect patient samples to identify frailty markers

Each database operates independently due to their research focus and aims. However, the BCB sarcomes is a national leader and has been working on this topic for about two years, actively participating to the inter-SIRIC OSIRIS group for defining ontology and selecting international standards and codification systems. Therefore, BCB sarcomes has spread its knowledge to the other databases in particular in the integration of “omics” data which are fast becoming a needed improvement and hope in cancer knowledge and treatment.

Biobanks

The Bordeaux Biobank resulted from the functional integration of the IB and CHU tumour tissue banks (Biological Resources Centres, CRB) operating under the supervision of Sylvie Huet for IB, and Prof. Béatrice Vergier and Jean-Philippe Merlio for CHU. Both the CRBs and the virtual tumour bank obtained NF S 9690 quality certification. The combined collection counts over 20,000 annotated samples including tumour, whole blood, serum and plasma. While the primary missions of these biobanks is to store and manage patients frozen samples in support of clinical routine as well as research analysis, many of the samples are associated with clinical information and are part of the clinical-biological databases.

Programme	Task contributing or benefiting from biobanks	# of pertinent samples available through CRBs managed by BRIO's members	Relation with clinical databases ou clinical trial
PrIME	Tasks 2, 3	Dedicated db >200 Overall >5000	Connected to PREPARE clinical Trial
COMMUCAN	Task 1, 2, 4	Kidney BCB >500 Colon >2000 Brai tumour	UroCCR: Réseau Français de Recherche sur le Cancer du Rein
IMS	Tasks 2, 3, 7	Over >2000	NetSarc – ResOs– – NetSarc – Conticabase – ConticaGist et ATG Sarc

The functional integration of the biobanks is supported by the virtual databank initiative of the Canceropôle GSO, and the complete collection is searchable through an interactive website (Virtual Tumour Bank GSO, http://www.biobank-gso.org/).

Databases are at the centre of our translational research.

Early Phase clinical trial

Institut Bergonié early phase clinical trial was labelised as "INCa early phase labeled centers" (CLIP²) in 2010. CLIP² are investigative centres specialised in the early testing of new medicines, from pharmaceutical laboratories and biotech companies but also academic laboratories. They receive logistical and financial support from the INCa in order to achieve the highest international quality standards in early phase clinical trials.

The objectives of CLIP² are:

- to facilitate the provision of new medicines for patients, based on an organised network able to offer all patients in France access to early phase clinical trials;
- to increase the visibility and attractiveness of French clinical research to pharmaceutical companies in France and abroad;
- to improve the quality of early phase trials in France and increase the number of tests;
- to enhance the value of academic clinical research by evaluating molecules in indications not covered by the development plans of pharmaceutical laboratories.

Practically, Institut Bergonié CLIP² included 705 patients in 116 Phase I and II clinical trials (205 patients in 36 phase I clinical trials) in 2016. In particular, patients had access to PD1 immuno-therapy treatment, anti CSF1-R and oncolytic vaccine (JX-594).

This early phase clinical trial unit is run in conjunction with the BIP programme, an institution-wide permanent screening programme (NCT02534649) started in 2014 to identify patients with somatic alterations that can be matched to targeted therapies in early phase clinical trials. In 2016, over 500 patients were screened.

Bordeaux University Hospital has joined as its onset in 2016 the European Consortium of Early phase in Cancer (EPON including Val d'Hebron in Barcelona, START in Madrid, NLNCI in Amserdam, UZ Leuven). More than 10 new phases I have started or are planned in forthcoming months, including the tumours selected in COMMUCAN project: kidney, glioma and colon cancer. In addition early phase II of combination between immunotherapies and/or targeted agents have been done outside the EPON consortium. In SIRIC Brio period more than 300 patients have been included in phase I or early phase II.

. Pharmacology

Pharmacology Laboratory

The SIRIC benefits from the support of a Pharmacology Laboratory established within the Pharmacology Department of the Bordeaux teaching hospitals and the University of Bordeaux. Lead by Prof. Mathieu Molimard, the department aims to understand, describe and teach the therapeutic actions as well as side effects of medicines in Humans. This environment delivered a strong expertise in Pharmacology research and development.
The Pharmacology laboratory is able to perform studies on isolated organs, *in vitro* studies (platelet aggregation, tissue fixation of medicines), whole animal studies, as well as the development and undertaking of drug quantification. Key expertise centre around:

- Development and validation of new methods for the quantification of medicines and toxics,
- Quantification methods,
- Bioequivalence,
- Drug-drug interactions,
- Drug tissue fixation studies.

Pharmaco-epidemiology: Bordeaux PharmacoEpi platform

The platform Bordeaux PhamacoEpi (BPE) lead by Prof. Nicholas Moore is an Inserm and Université de Bordeaux certified platform dedicated to perform on prescription drug usage in real-life conditions.
The team is composed by more than 50 professionals combining all the necessary skills. It realizes over 60 studies per year (field-based or through data mining in the France health insurance databases). The studies are collaborative and international, based on transparency and quality. For every study, the team develops dedicated operational tools to deliver the results of the studies to the health authorities and to the sponsors. The platform appeared in over 100 publications in the last 5 years.
Area of expertise:

- field studies:
    - Cross-sectional studies/cohorts "drugs" or "pathology",
    - Case-control study,
    - Modes of collection adapted to the nature of the study: questionnaires for doctors, pharmacists and patients, collection from medical files, and various tools,
    - Process and circuit of data adapted to the volume of data.
- databases studies:
    - >12 years of experience (SNIIRAM, Sample EGB),
    - Access to other databases in Europe and USA (ENCePP networks, alliance EU-ADR).

The platform has key interactions with the Bordeaux Population Health-Inserm research centre U1219. The team is devoted to Pharmacoepidemiology, which studies medical drugs and devices at the level of populations. The researchers aim to characterise drug patterns of use and potential misuses, assess potential health hazards associated with this use in real-life, and ensure that the beneficial effect proven in clinical trials is confirmed in everyday use. The final aim is to quantify the actual public health impact of marketed medicines.

. Biology

Screening BMYScreen

BMYscreen is an independent joint structure created in 2014 in Bordeaux under the auspices of the Université de Bordeaux, Inserm and ADERA and sponsored by the *Conseil Régional d'Aquitaine*. Originating from the Eric chevet Laboratory, BMYscreen offers its long-standing expertise on advanced biotechnologies to academic laboratories.
BMYscreen provides assay development, *in vitro* screening and quantitative biomarker determination within R&D collaborations and fee for service contractual agreements.
BMYscreen advanced knowledge of biochemical stress pathways effectively supports product development efforts in the field of therapeutics and functional foods for human and veterinary applications.

BMYscreen offers state-of-the-art services to identify key molecules, bioactive compounds or proteins, in cells and tissues that can be targeted or used to improve well-being or health.
Based on the technologies (Alphascreen®, Cytation3) implemented, BMYscreen offers its clients the possibility to develop miniaturized and high-throughput compatible assays reporting for biomolecular interactions or enzymatic activities or for the detection and quantification of select analytes and stress pathways. This assay development capability can rely on client's own molecular tools or can also include a molecular tool selection approach (home-made or commercially available).

Fields of application

BMYscreen services are designed to support R&D programmes in nutrition, cosmetology and pharmacology and provide technical solutions to:

- Identify health effects of bioactive compounds or extracts,
- Discover mechanism of action of bioactive compounds,
- Find novel anticancer drugs,
- Assess toxicity of (a) given compound(s),
- Identify molecules targeting disease-specific molecular pathway,
- Quantify biomarkers in biological samples analysis.

Metabolomics: CELLOMET

CELLOMET is a technology platform and a consulting office which provides expert services in metabolic sciences for academia. CELLOMET is a platform funded by institutional partners *(Région Nouvelle-Aquitaine, ADERA, Université de Bordeaux).*

CELLOMET is dedicated to the development and implementation of cutting-edge, tailored metabolomics techniques. Metabolomics-based projects are designed on a case-by-case basis, allowing scientists to achieve the answers they need to their biological question.
Key areas of expertise are:

- **Energy metabolism and health**

In addition to the approximately 200 rare diseases with an alteration of energy metabolism, a huge number of individuals suffering from chronic illnesses and age-related diseases also present various aspects of bioenergetic alterations and could benefit from adapted bioenergetic modulation therapy (BIOMET). For instance, dysfunction and deregulation of numerous mitochondrial and cellular bioenergetic were reported in several types of human cancer.

- **Mitochondrial physiology and pharmacology**

In addition to their biological function as the cell powerhouse, mitochondria are now also considered as signaling platforms that control pathways involved in cell fate and the immune response to pathogens and cell stress. These highly dynamic organelles host numerous innate immune signaling regulators, of which some are directly linked to the OXPHOS capacity and its control of oxidative stress. Therefore, mitochondrial bioenergetics is tightly connected to innate immunity and the extent of the immune response. Importantly, mitochondrial oxidative metabolism in T cells is instrumental to acquire their adaptive effector immune functions. Therefore, they emerge as promising therapeutic targets to improve T-cell mediated antitumour immune response, impair inflammation, or inhibit autoimmune processes.

- **Metabolic remodeling**

In cancer cells, metabolic flexibility allows tumours to grow despite the lack of oxygen or glucose, by switching from one energy substrate to another. Metabolic remodeling involves nodal enzymes but also transcription factors and kinases. Metabolic remodeling constitutes a target of choice to modulate energy metabolism and advances in the field demonstrate that energy transduction processes are tightly linked with epigenetic control, amino-acid and lipid biosyntheses, antioxydant production or cellular adhesion and migration processes.

- **Bioenergetic modulation therapy (BIOMET)**

The regulation of energy metabolism is multisite and the potential sites for bioenergetic modulation therapy (BIOMET) with health benefits could be numerous. Some therapeutic strategies aiming at the

stimulation of energy metabolism were already tested at the preclinical stage, either through pharmacology or genetic means, and clinical trials are ongoing for some drug candidates.

Bordeaux Imaging Center

The BIC (Bordeaux Imaging Center) offers resources in photonic and electronic imaging, mainly in life, health and plant sciences. It is a core facility identified at the national level as IBISA that gathers 12 highly skilled engineers. It obtained the ISO9001 certification.

The different components of the BIC are:

- PHOTONIC imaging
- ELECTRONIC imaging
- PLANT imaging

The Bordeaux Imaging Center offers access to the most advanced bio-imaging techniques for fixed and live cell imaging such as video-microscopy, confocal microscopy, multiphoton microscopy, transmission electron microscopy and scanning electron microscopy. The BIC provides a unique set of high-end equipment for super-resolution microscopy such as STED confocal microscopy, FRAP video-microscopy, lifetime imaging FLIM for the measurement of molecular interactions. We also provide access to equipment for sample preparation such as ultra-microtoms, high pressure freeze (HPF) and we can host live samples.

GRIC / Immunology Laboratory of the CHU

The GRIC offers a highly specialised immunoassay service providing support for the development of clinical research programmes relying on biological evaluation of immune parameters in patients. This facility, incorporated in the hospital structure, aims to provide a dynamic exploration of the immune system in patients receiving immune-modulating agents in the context of clinical research trials, develop and validate biomarkers employed in patient selection and help to identify potential combinations of therapeutic agents. In order to foster innovation in “Immunotherapy/ Biotherapy” and ensure it crosses over to the clinical context, the GRIC wants to set up specific immune monitoring platform for cancer.

This facility, incorporated in the hospital structure, aims to:

- Provide a dynamic exploration of the immune system in patients receiving immunomodulating agents in the context of clinical research trials,
- Develop and validate biomarkers employed in patient selection and help to identify potential effective combinations of therapeutic agents,
- Monitor patients irrespective of HLA subtype,
- Measure T cell immunity against antigens whose epitopes are unknown,
- Determine the type of T cell responses by multiplex analysis of secreted cytokines, allowing the identification of the type of induced specific immunity and the assessment of specific function/behaviour,
- Monitor biodrugs (in collaboration with the PK/PD research department of hospital pharmaceutical departments) to quantify mAbs, detect ADAb, optimise dose and dosage interval, perform PK/PD studies on mAbs and antibody combinations. Population pharmacokinetic to define relationship between interindividual variability and patient’s characteristics.

Proteomic: ONCOPROT

Currently, the identification of genomic abnormalities in tumours allows to establish prognosis and to predict the susceptibility or resistance to some chemotherapy regimens raising the possibility in the near future of individualised therapeutic approaches and thus better management of patients.

Proteins expression is the downstream result of these combined genomic anomalies in tumour cells and essential for a better understanding of the mechanisms of cancer initiation, tumour progression and metastatic scattering and to identify new biomarkers and pharmacological targets.

Mass spectrometry is the method of choice to identify, characterise and quantify the proteins in a complex sample. Resulting from a know-how acquired during the development of a new procedure of subcellular proteomic analysis that has been the object of a patent registration, ONCOPROT develop a method combining laser microdissection and mass spectrometry analysis to compare the levels of protein

expression between tumour and non tumour tissues derived from the same patient. This procedure can be done from classical formalin-fixed paraffin-embedded tumour sections.

This method can:

- increase the quantity of clinical data compared with a classical immunohistochemistry analysis,
- complete the genetic mutations analysis of tumours,
- highlight new signature biomarkers.

Moreover, the development of this approach can be used to answer various questions:

- for a more precise classification of the different stages of tumours,
- to study the heterogeneousness of tumours and identify more aggressive clones,
- to estimate the level of aggressiveness of benign tumours,
- to discriminate patients good and bad responders to chemotherapies,
- to isolate metastatic cells for a targeted study.

. Bioinformatics – Personalised medecine

Bioinformatics

The **Bordeaux Bioinformatics Center** (CBiB) is a bioinformatics core facility that provides access to high-performance computing resources, data analysis and programming expertise. The resources serve scientists and private labs to fulfill the bioinformatics needs of their research in an efficient and cost-effective manner. We offer state-of-the-art technologies for working with clinical, translational, and basic science data – from acquisition and storage to analysis and sharing. Our resources are secure and standards-compliant. From a few samples to several tens of thousands, the Innovation Centre provides complete DNA, RNA, metabolomics and proteomics analysis services. The main competences and related service provision are listed here below:

- Hosting and maintenance of public software and databases: CBiB's servers host a large number of bioinformatics applications and databases that are updated regularly. Part of these resources is freely available from the CBiB's Galaxy Instance (http://services.cbib.u-bordeaux2.fr/galaxy/).
- Hosting and maintenance of software and/or data request protected by a secure access: upon of users, the CBiB deploys programmes or data protected by a secure access.These may include software that requires a license and cannot be made publicly available or data that the providers do not wish to make public.
- Development, exploitation and maintenance of databases and innovative services or international scale: through its research activities or collaborations, the CBiB develops new resources, services or databases, which are made publicly available on its website.
- Customise software development using its own human resources, the CBiB carries out software development for cases that are not covered by publicly available tools. Supervision of engineering work in the areas of bioinformatics and biological data analysis the CBiB hosts and manages permanent and contractual engineering staff and/or post-docs who develop specialised information systems or participate in the data analysis and interpretation (*e.g.* annotation of SNPs). In these projects, the CBiB also provides computational and storage resources.
- Hosting and training of users of bioinformatics programmes and databases receives biologists who wish to master the use of bioinformatics tools.
- Continued education.

The **CBiB** - Bordeaux Bioinformatics Centre has been approved by **Lloyd's Register Quality Assurance** to the following Quality Management System Standards: **ISO 9001.**

. Animal Research

In vivo facilities

Their aim is to provide further service to the cancer research community in Bordeaux by increasing the accessibility of their animal facilities and by providing specific service to the cancer research community. The *"Service Commun des Animaleries"* offers unique and efficient facilities for *in vivo* studies in rodents related to cancer.

They can provide the cancer researchers in Bordeaux with the wild type and transgenic mice and some of the experiments can be directly performed as a service by the staff to ensure the best reproducibility.
In vivo experiments are a critical step in cancer research and drug development. Maintenance of a high sanitary quality level animal house is expensive but critical for the quality of the research produced. Their four animal houses with different and complementary status and competences are open to all cancer research groups. Thus, their application may help to provide cancer research groups with a better access to *in vivo* experiments, which are required along the bench to bedside process.
We have some particular skills on the field of cancer in three of our structures:

- A1 level, without pathogen specific organisms, which is particularly dedicated to transgenic mice production and crossing, including penta-transgenic mice generation by specific crossing, etc.
- A1 level, without pathogen specific organisms, and is specifically dedicated to tumour xenografts in immunodeficient mice.
- A2 level, which allows research on A2 level pathogens and the use of A2 level cells, virus and other genetically modified organisms. In the field of cancer research, this is of particular interest for xenografts of human primary tumour explants on immune-deficient mice.

Thus, the three engineers responsible for these animal houses with their staff have great expertise and skills in the field of experimental cancer research using *in vivo* models in rodents.

Dr Abdel-Majid Khatib develops the facilities to utilise zebrafish in Cancer research. Zebrafish has emerged as an attractive animal system for modeling human cancers. Major technical advances have been essential for the generation of zebrafish cancer models relevant to human diseases. These models develop tumours in various organ sites that bear striking resemblance to human malignances, both histologically and genetically. This platform offers its service to Bordeaux researchers.

Imaging

Imaging has become an indispensable tool in cancer research, clinical trials and medical practice. The Vivoptic platform of IMOTION offers access to an outstanding selection of optical imaging devices. The Vivoptic platform provides a recognised expertise in optical imaging for preclinical cancer research and translational applications by Prof. Vincent Dousset.

Access to the Vivoptic platform is open to both academic and non-academic research teams according to the France Life Imaging rules:

- User support and training for autonomous utilisation of imaging equipments is performed by the IMOTION team members (F. Couillaud; C. Germain-Genevois).
- Vivoptic is agreed for animal experiment under agreement number A33-063-919. Protocols should be approved by Bordeaux local ethical comity (CEEA 50). Animals are from security level A1 and are not allowed to stay at the platform during the night.
- Probes, reporter genes for bioluminescence and fluorescence, molecular constructs, genetically modified cells lines (U87; HT29; RM1, GL261, LNCap), transgenic mice could be provided on request by IMOTION team according to the current laboratory practices (MTA).
- Clinical expertises could be provided by IMOTION team members including kidney and prostate cancer (N. Grenier & F. Cornelis), breast cancer (J. Palussière), Glioblastoma (H. Loiseau, S. Eimer) and liver cancer (H. Trillaud & A. Hocquelet).

The Vivoptic platform offers a wide range of fluorescent setup for clinical and preclinical imaging. The IMOTION team is pioneer in preclinical application of NIR fluorescent proteins. It has been also involved for preclinical validation of fluorescence tomography fDOT and FMT-based on continuous fluorophore excitation.
Current project concerns translational validation of a bi-functional imaging system coupling endorectal echography and time resolved fluorescence tomography for biopsies guidance of prostate cancer.

Histopathology

The Histopathology platform is affiliated to the BaRITOn unit and belongs to TBMCore (INSERM US005) and is led by Prof. Pierre Dubus. The platform holds a dual purpose:

- A technical department for animal and human anatomy pathology,
- A training service for the different techniques and equipment of histology.

As such it provides a series of benefits:

- Advice to users for research projects,
- Practical advice for the experimentation and preparation of samples:
  - Sample
  - Fixation
  - freezing
  - Paraffin and frozen sections ...
- Sample support,
- Training users on different devices,
- Custom coloring,
- Customised markings (development and validation of antibodies),
- Acquisition of images in light background and fluorescence (epifluorescence, virtual microscopy, confocal microscopy).

. Chemistry - Physics

Chemical synthesis

SynVec have several competencies and expertise in custom chemical synthesis and specially in organic and bio-organic synthesis. SynVec master chemical vectors synthesis, these vectors involve peptides sequences which allow tumour special targeting. Peptide synthesis is one the main expertise of SynVec, we can supply several kinds of peptides, such us linear form, cyclic form, florescent form, labeled form. We can also include FRET systems in the peptide sequences which could offer the possibility to monitor enzymatic activities.

SynVec is a transfer technology unit specialised in chemical synthesis. SynVec offer several services in the field of chemistry:

- R&D organic synthesis programs: SynVec determine best route of synthesis. Their company may conduct preliminary experiments to determine feasibility and offer continuous range of problem-solving expertise in chemical synthesis.
- Chemical vectors synthesis programs: Their developed vectors allow driving small and medium molecules by coupling them to other conjugates to increase their efficiency or to decrease their toxicity in the biological media.
- Custom synthesis (heterocycles, fluorescent dyes, labeled molecules…): Due to SynVec team experience, to chemists' expertise and to extensive bibliographic research, they can provide a large range of chemical synthesis.
- Custom peptides design and synthesis (linear, cyclic, fluorescents, labeled…): SynVec provides high quality peptide synthesis services.
- Scale-up synthesis: SynVec provides synthesis scale-up from milligram quantities to gram and kilogram quantities. Their team assists their customers with quick optimization of clients' medicinal chemistry routes to prepare the required large quantities of their drug candidates for pre-clinical developmental studies.
- Synthesis of modified nucleosides and phosphoramidites: The importance of modified nucleoside and phosphoramidites in cancer treatment is growing. SynVec team is able to provide a large range of these molecules.
- Purification, and/or organic compounds identification: Purification by chromatographic technique is one of SynVec team expertises.

Custom synthesis (heterocycles, fluorescent dyes, labeled molecules...): due to SynVec team experience, to chemists' expertise and to extensive bibliographic research, we can provide a large range of chemical synthesis:

- Classic organic synthesis (alkylation, amidation, esterification, oxidation, reduction…)
- Heterocyclic and muti-stapes synthesis
- Molecule labeling (Deuterieum, fluorescent dyes…)
- Pharmaceutical impurities synthesis

Structural biology

- **IBiSA Biophysical Chemistry Platform**

The Structural Biophysico-chemistry Platform (SBPCP) is entirely located at the *Institut Européen de Chimie et Biologie* (IECB) in Pessac, France. http://www.iecb.u-bordeaux.fr/index.php/en/technology-platforms.

The Structural Biophysico-chemistry Platform is part of the UMS3033/US001, which is the permanent entity of the IECB that provides administrative and technology support to the temporarily hosted teams and start-ups. The role of the SBPCP is to be at the forefront of methodological developments in Structural Biochemistry and Biophysics, by gathering on the same site a coherent set of techniques and expertise. This expertise is nurtured by the synergies between the platform and research teams. Thanks to the popularization of the expertise and specialties of the SBCP-IECB through success stories initiated with the local teams, it has acquired a strong international reputation for the study of molecular recognition in both chemistry and biology, and therefore serves a much broader community of researchers on the national and international level. At the SBPCP-IECB, **molecular recognition and supramolecular assemblies are investigated from a structural and biophysical perspectives**, by regrouping expertises in NMR spectroscopy, X-ray crystallography (including SAXS/WAXS), molecular modeling, mass spectrometry, surface plasmon resonance and spectroscopy (absorption and circular dichroism spectroscopy). Importantly, the platform is positioned **at the frontiers between chemistry and biology, by focusing both on biological molecules and on synthetic molecules (foldamers) conceived to fold and self-assemble like biological molecules, and/or interact with biological systems.**

By combining structural biology with biochemistry and functional studies, researchers using our platform are able to gain an understanding of important biochemical interactions in the spread of cancer throughout a patient's body. Consequently, several team leaders, expert on our facility in Structural biology, have joint appointments with other divisions (e.g. Cancer Biology and Cancer Therapeutics) to facilitate the exploitation of the molecular understanding of biological mechanisms in the development of new cancer therapies.

- **CBMN, team "Spectroscopy and Imaging of Membrane Active Peptides"**

The team "Spectroscopy and Imaging of Membrane Active Peptides" is integrated in the CBMN "Chemistry and Biology of Membranes and Nano-objects" and has a great expertise in the characterisation of molecular interactions, especially those occurring at the lipid membrane level (see the team link: http://www.cbmn.u-bordeaux.fr/32-.html). The characterisation of the kinetics, affinity and conformational changes occurring upon such interactions is important in the understanding of several biological phenomena, including cancer. The team is equipped with state of the art equipment, for the full characterisation of such molecular interactions, some of which are unique in Europe such as the case of plasmon waveguide resonance (PWR), a technique developed in our laboratory. Additionally, the laboratory is expert in vibrational spectroscopy and imaging (ATR-FTIR, PMIRRAS, Raman, SERS) to study the interaction at the molecular scale or in vivo in single cell (by Raman).

. Humanities and Social Sciences (HSS)

HSS are an essential component of our development of cancer research in Bordeaux and their inclusion in BRIO activities has been greatly increased since the designation. Interaction between clinicians and HSS researchers is essential to foster new projects. To that effect BRIO can count on the HSS axis design in the first SIRIC designation as a platform. The HSS axis is now coordinated by Prof. Bruno Quintard and includes nine HSS researchers as a team to support our HSS initiative: Béatrice Jacques, Marie Pierre Chopin, Marie Aulois-Griot, Hèlène Hoarau, Marion Barrault, Nena Stadelmaier, Olivier Claverie, Philippe Gorry, Barbara Steigler. It also interacts with a number of research teams in Bordeaux:

Field	Groups	Field	Groups
Psychology	LPSQV EA4139	**Philosophy**	SPH
Clinician	IB, CHU	**Communication Sciences**	MICA
Anthropology	ADES	**Economy**	GRETHa UMR 5113
Sociology	Centre Emile Durkheim	**Law**	INSERM U1219
Education Sciences	LACES (EA-4140)	**Nursing Sciences**	

The axis is highly interdisciplinary with an added representation of the hospitals and clinicians as well as diverse disciplines. It will aim to:

- Support the emergence of HSS projects within BRIO.
- Organise interactive events: discussion events in casual setting (between clinicians and HSS researchers). Similar meetings were hold in the first SIRIC designation and extended to all the stakeholders on cancer care and research such as patient associations, nurses and politicians.
- Cancer HSS research events: aiming to present HSS researchers and HSS methodology to BRIO community.
- Inter SIRIC HSS group to discuss HSS integration throughout the SIRICs.