

LIST OF TECHNOLOGIES AND AREAS OF EXPERTISE

PORTFOLIO OF BIOTECH PRODUCTS/ACTIVITIES/TECHNOLOGIES

SUBJECT	AREA	DESCRIPTION AND RESULT	VALUE
Isolation protocols of primary cells from samples of normal and pathological tissues	Medicine Biotechnologies Pharmacology	Isolation, expansion and phenotypic characterization of: mesenchymal cells, endothelial cells and tumour cells from tissues for pharmacological studies and/or cell therapy.	Pillar
Isolation protocols of lymphocyte subpopulations	Medicine Biotechnologies Pharmacology	Isolation and characterization of lymphocyte cell subpopulations from peripheral blood or bone marrow of healthy donors or patients, for pharmacological and molecular studies.	Pillar
Preclinical evaluation of innovative drug treatments	Medicine Biotechnologies Pharmacology	Preclinical studies using primary leukemic cell cultures to analyse the efficacy of new molecules in onco-haematology and to study their mechanism of action.	Pillar
Banks of primary cells and sera	Medicine Biotechnologies Pharmacology	Collection, cryopreservation and cataloguing of viable cells purified from human tissue (e.g. blood, endothelium, placental cord) and serum or plasma, for basic research or clinical studies, for biomedical research groups.	Pillar
<i>In vitro</i> evaluation of effects of drugs, active ingredients and new molecules on primary cultures of human endothelial cells.	Medicine Biotechnologies Pharmacology	Monitoring of cell proliferation and cell migration in response to treatment; study of the possible cytotoxic effects or, on the contrary, the protective/therapeutic effects in <i>in vitro</i> models of inflammation.	Pillar
Analysis of cytokine release into biological samples using the Luminex technology.	Medicine Biotechnologies Pharmacology	A complete solution for quick and accurate quantitation of panels of analytes (up to 50 simultaneously) in precious samples of which have small volumes, such as serum / plasma of patients, cell supernatants, cell lysates, etc..	Pillar
Biobanking of viable tumor samples from surgical specimens obtained from surgical resections.	Medicine Biotechnologies Pharmacology	Preparation of cellular and xenograft models for preclinical personalized medicine assays.	Monitoring
<i>In vitro</i> evaluation of effects of different compounds in cellular models	Medicine Biotechnologies Pharmacology	Assessment of the antiviral activity of exogenous compounds on cellular models <i>in vitro</i> infected with different viral strains.	Monitoring

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Flow cytometry assays to support clinical research	Biotechnologies Medicine	Identification in whole blood of specific cell subsets by labelling with a panel of fluorescent antibodies and immunophenotypic characterization by mono- or multiparametric analysis.	Pillar
Flow cytometry assays to support basic/preclinical research	Medicine Biotechnologies Pharmacology	Phenotypic characterization of specific cell populations of interest by mono- or multiparametric analysis; quantitative evaluation of cell proliferation and apoptosis after treatment with drugs or other compounds; monitoring of cell differentiation through the analysis of lineage-specific surface markers; monitoring of transfection efficiency.	Pillar
Cell population sorting	Biotechnologies Medicine	Isolation of highly purified viable cell populations from different human and animal tissues, using high throughput cell sorting.	Pillar
Electron microscopy analysis of cells, tissues or organs, biopsies	Medicine Biotechnologies Pharmacology	Morphological observation using TEM and SEM of cells from patients or cells undergoing <i>in vitro</i> treatment, to evaluate any alteration in their morphology.	Pillar
Electron Microscopy analysis of synthetic nanoparticle preparations and dental prosthesis	Biotechnologies Pharmacology	Physical analysis of samples by viewing under SEM. Study of the dispersion of the diameter and morphology of nanoparticles. Evaluation of the composition and wear of dental implants.	Monitoring
Electron Microscopy analysis of air quality	Medicine Ecology	Detailed analysis of environmental filters using electron microscopy.	Monitoring
Electron Microscopy analysis of mechanical components	Mechanics Chemistry	Analysis of the condition of metallic surfaces using SEM to observe the presence of defective or oxidised components.	Monitoring
Analysis <i>in live</i> of intracellular kinetics in individual cells using confocal and digital microscopy	Pharmacology Medicine Biotechnologies	Protocols for high speed, high resolution and multiple wavelengths analyses, for monitoring the morphology of dynamic intracellular structures in individual cells and for measuring intracellular parameters.	Pillar
High-content, high-throughput study of cytometric parameters in cell populations using digital microscopy	Pharmacology Medicine Biotechnologies	Protocols for monitoring the proliferation, survival and differentiation of cells in response to treatment in screening programs for pharmacologically active molecules.	Pillar
Cellular metabolism assays	Pharmacology Medicine Biotechnologies	Protocols for monitoring O ₂ consumption, ATP production, glucose consumption in response to cellular treatment for screening of pharmacological active molecules.	Monitoring

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Microarray hybridization and interpretation	Medicine Pharmacology Biotechnologies	Molecular and bioinformatics analysis to define the gene expression profile of samples in order to identify alterations that can be associated with specific phenotypes or diseases.	Pillar
Computer analysis of high-throughput experiments	Biotechnologies Medicine Pharmacology	Computer analysis of data from quantitative PCR, next-generation sequencing, microarray, CGH, methylation, SNP and CNV.	Pillar
Studies of mathematical models applied to imaging	Medicine	Mathematical approaches aimed at optimizing the recovery of digital content from images corrupted by noise.	Monitoring
Analysis using GAMES software	Biotechnologies Medicine	Analysis of next-generation sequencing data to reduce the complexity of data from large scale DNA sequencing.	Pillar
Study of new molecules efficacy for endocrine disorders treatment	Pharmacology Medicine Biotechnologies	<i>In vitro</i> evaluation of the effects on cell viability, hormone secretion and activation of specific signalling pathways. Identification of biological markers in response to new drug molecules.	Pillar
Functional studies on blood clotting cascade	Medicine Biotechnologies	Evaluation of blotting cascade efficiency in micro-volumes of plasma by functional assays through fluorogenic substrates. Binding assays to test the interactions of coagulative factors with other molecules.	Pillar
Analysis of peptide and organic molecules using mass spectrometry	Pharmacology Biotechnologies Chemistry	Determination of molecular weight using LC/MS Q-TOF technology.	Pillar
Neurodegenerative disease models	Medicine Biotechnologies Pharmacology	Characterization of <i>in vivo</i> models of epilepsy and other neurodegenerative diseases; preclinical studies of the effects of novel pharmacological and cellular therapies.	Pillar
<i>In vitro</i> models for pharmacological and toxicological studies	Pharmacology Medicine Biotechnologies	Preparation and characterization of primary cultures of neurons, astrocytes and microglia from wild-type and genetically modified animals, to study the effects of advanced therapies.	Monitoring
Neurochemical analysis in experimental disease models	Pharmacology Medicine Biotechnologies	Microdialysis technique for <i>in vivo</i> evaluation of the release of neurotransmitters; measurement and quantification of neurotransmitter levels and/or of substances derived from brain dialysate.	Pillar
<i>In vivo</i> models of myocardial infarction	Medicine Pharmacology	Induction of myocardial infarction in rats for preclinical evaluation of innovative cell and/or drug therapies.	Pillar

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Isolation and characterization of mesenchymal stem cells from adipose tissue	Biotechnologies Medicine Pharmacology	Phenotypic and functional study of mesenchymal stem cells from adipose tissue of healthy subjects and patients with heart failure for the preclinical evaluation of cell therapies.	Pillar
<i>In vivo</i> models for pharmacology and toxicology studies	Pharmacology Medicine Biotechnologies	En face analysis of mouse aortic endothelium.	Pillar
<i>In vitro</i> and <i>ex vivo</i> models for angiogenesis, pharmacology and toxicology studies	Pharmacology Medicine Biotechnologies	Endothelial cells tubes formation in Matrigel and mouse aortic rings in collagen.	Pillar
Conducting clinical studies	Medicine Pharmacology	Management of randomised and/or observational studies in the biomedical field to evaluate new drugs, biotechnologies and treatment protocols.	Pillar

VALUE:

MONITORING

PILLAR

REDUCED INPUT

EMERGING TECHNOLOGIES AND/OR TECHNOLOGIES UNDER EVALUATION

BASIC/KEY TECHNOLOGIES OFFERING A COMPETITIVE ADVANTAGE

TECHNOLOGIES OF DIMINISHING IMPORTANCE OR TRANSFERRING TO OTHER AREAS