CRG
Centre
for Genomic
Regulation

CORE TECHNOLOGIES

Cutting-edge technologies to empower your research

At the Centre for Genomic Regulation we recognise that investing in state-of-the-art research infrastructures is critical for creating a thriving environment for research excellence and technological innovation. Our Core Technologies programme is designed to provide the highest level of support for scientists in the biomedical field, providing world-class services for cutting-edge research.

I am proud that over the years, we have established a widespread international reputation for excellence. This has fostered deep collaborations with our providers and has led to beta-testing cutting-edge technologies. Our profound expertise and innovative working culture have consolidated our position as one of the best units of its kind for biomedical research.

Take a virtual tour to the CRG Core Technology Units

https://3dcores.crg.es/

Mònica Morales

Head of Core Technologies at the Centre for Genomic Regulation

We offer:

- State-of-the-art equipment and applications
- Advice and expertise including consultation, experimental design, sample preparation, data processing and data analysis
- Close collaboration that provides integrated services and end-to-end solutions for tailored projects (CRISPR/Cas9 genome editing, metagenomics projects that range from DNA extraction to bioinformatics analysis, or single cell technologies, among others)
- The development of new methods and applications and the implementation of the latest emerging technologies in our fields
- Multi-disciplinary training for the community and dissemination of new methods
- Common procedures across all units, such as unique entry point for requesting access (https://crg.agendoscience.com/), homogenization of workflows, and collection of metadata from each experimental project

We are a founding member of:

CORE FOR LIFE

European Excellence Alliance of Core Facilities

Genomics Unit

State-of-the-art Next Generation Sequencing (NGS) services with a wide range of high-throughput applications including single cell sequencing projects.

Proteomics Unit

Quantitative proteomics in discovery and targeted mode, characterization of protein interactions, and protein post-translational modifications.

Bioinformatics Unit

Consulting services, planning NGS and other genomic experiments, data processing, analysis and management, software and database development, and bioinformatics training.

Protein Technologies Unit

Genome engineering, DNA assembly, protein production and purification and biomolecular characterization of proteins and protein complexes. We also offer automated solutions in the context of biomolecular and biochemical screening assays.

Tissue Engineering Unit

Cutting-edge technologies in stem cell biology, stem cell differentiation, organoid formation and induced pluripotent stem cells. We support end-to-end projects from specific gene editions in a particular cell type/organoid to quantitative cell-based assays.

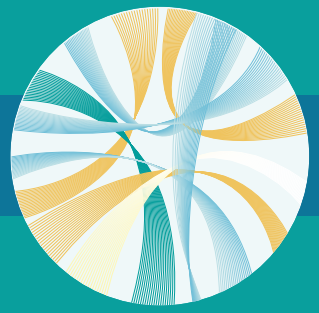
Advanced Light Microscopy Unit

Microscope systems specifically designed for fluorescence microscopy ranging from widefield, confocal to super-resolution systems, revealing structures from macro to the nanoscale. Image data management, processing and analysis.

Flow Cytometry Unit

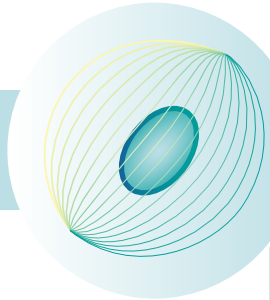
Applications to study cell surface receptors, nuclear and cytoplasmic antigens, DNA content, enzyme activity, membrane permeability and calcium flows. We have developed unique applications for sorting of single virus particles and sorting of extracellular vesicles, and we have implemented flow karyotyping by sorting of chromosomes.

You can contact the CRG Core technologies by sending an email to **monica.morales@crg.eu** or requesting a new user account through **https://crg.agendoscience.com/**



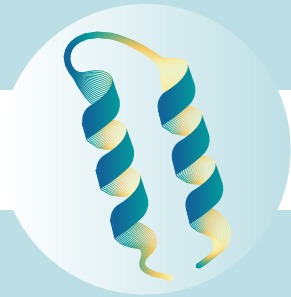
DNA and RNA

- Single-molecule fluorescence in situ hybridization (smFISH) and localization microscopy (DNA-PAINT)
- Single-cell, bulk gene and isoform expression analysis
- Detection of single nucleotide, structural and copy number variants, genome assembly (WGS, WES)
- Metagenomics (shotgun, whole genome and amplicon) sequencing projects (from DNA extraction to data analysis)
- Genomic and epigenomic regulation studies
- Genome editing technologies
- Low input and FFPE DNA and RNA samples
- Flow karyotyping for chromosome sequencing



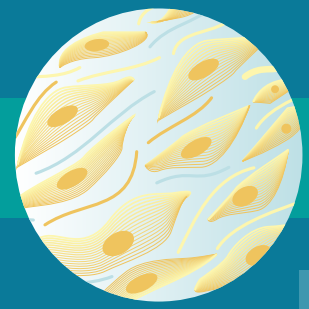
CELLS

- Single cell sorting for cloning, single cell genomics and transcriptomics.
- Single virus sorting for single virus genomics
- Extracellular vesicles sorting
- Immunophenotyping
- Human and mouse pluripotent stem cell reprogramming, QC and differentiations into neuronal, cardiac, endothelial and retina pigmented epithelium
- Cell line assays: Citotoxicity, Proliferation, Functional assays (TEERT, MEA), Optogenetics
- Live and fixed cell imaging from macro to micro to nanoscale and high temporal resolution and image data analysis
- High-throughput high-content screening
- High-throughput genome editing in cell lines



PROTEINS

- Proteome quantification in liquid biopsy, tissues and cell cultures
- Validation of protein biomarkers
- Confirmation of protein sequences, modifications, products and by-products
- Identification of interaction of proteins with small molecules, drugs, RNA and DNA
- Temporal and spatial protein detection and tracking using fluorescently labeled dyes
- Protein production and purification of antibodies and antibody fragments, antigens, fusion proteins, protein complexes
- Biophysical characterization of proteins, nucleic acids and small compounds including kinetic and affinity interaction analysis



TISSUES

- Generation of 2D and 3D cell models as an alternative to animal experimentation, including patient and non-patient derived organoids and tumoroids, pseudostratified mucociliary epithelium, neurons and cardiomyocytes
- Derivation of mouse preimplantation embryos and study of teratogenic effects
- Tailored cell assays of toxicity, viability, and efficacy readouts in all the above models
- Live, fixed, and cleared tissues and organ imaging using fluorescently labeled dyes
- 3D image processing, analysis and visualization of organoids and embryos

OUR PLATFORMS ARE RECOGNIZED AS CRUCIAL SPANISH AND EUROPEAN RESEARCH INFRASTRUCTURES

PLATFORM ISCIII BIOBANKS AND BIOMODELS

Our Tissue Engineering Unit is an official node of Spain's national biobank and biomodel platform

OmicsTech

The joint CRG/UPF Proteomics unit is an official node of a Spanish national infrastructure that provides services for the scientific community

elixir

Our Bioinformatics Unit is part of an internationally-renowned network that brings life science resources together

EURO BIOIMAGING

Our Advanced Light Microscopy Unit is a node of a European infrastructure which provides access to imaging technologies, training and data services in biological and biomedical imaging

WORLDWIDE EXCLUSIVE APPLICATION:

The CRG/UPF Flow Cytometry Unit has developed a high-resolution methodology to isolate individualized viral particles and study their genomes. This application allows the identification of new existing viruses in different samples or ecosystems, contributing to deciphering the virosphere, an essential part of the global microbiome. With this revolutionary development, we have positioned the Flow Cytometry Unit as a worldwide reference in the field of virus sorting for the study of single-virus genomics, and we receive and attract researchers from all over the world.

A FOCUS ON TRANSLATIONAL RESEARCH

The CRG/UPF Proteomics Unit coordinates the Biomedical Proteomics Platform (ProMed) formed by seven leading institutions in the field of clinical and biomedical research in Catalonia. The ProMed Platform represents an impetus to the study of proteins in the health research system in Catalonia by encouraging the shared use of high-tech equipment – located at the Centre for Genomic Regulation in Barcelona – among applicant entities, with the objective of addressing emerging challenges in biomedicine and translational research.

The Protein Technologies Unit is agile and adapts to any situation. The Unit contributed to many diagnostic and seroprevalence studies during the COVID pandemic by producing several Sars-CoV-2 viral proteins, and the ACE-2 human protein, one of the main entry human receptors for the virus. The unit produced proteins for researchers at Hospital Clínic, IDIBAPS, ISGlobal, IMIM, the Centre of Astobiology in Madrid, and the company Ingenasa.

WHAT OUR CUSTOMERS SAY

"We used the services of Protein Technologies Unit at the CRG and were always happy with the excellent service and result quality"

Ariadna Montero, PhD
Co-founder and Head of Biology, Orikine Bio

"With the Biacore we can run large antibody screenings in a matter of days. The instrument is well maintained and the service is very professional"

Salva Guardiola, PhD
Sr Scientist, ONA Therapeutics

"Our collaboration with the CRG has allowed us to access state-of-the-art technology, equipment and infrastructure, as well as highly qualified and up to date staff"

Marina Rigau, PhD
CEO, MiMARK

"Albumedix' collaboration with the CRG has allowed us to achieve key project milestones thanks to a personalized project design and execution using advanced equipment and counting techniques, all with the support of highly qualified personnel experts in the field"

Phil Morton, PhD
CTO, Albumedix

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CORE FOR LIFE

CERCA Centre:

CERCA Centres de Recerca de Catalunya

Distinctions:

Excelencia Severo Ochoa

The Core Technologies programme has received support from FEDER funds over the years through different national and regional funding schemes:

Unió Europea
Fons Europeu
de Desenvolupament Regional