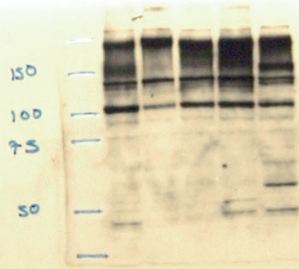
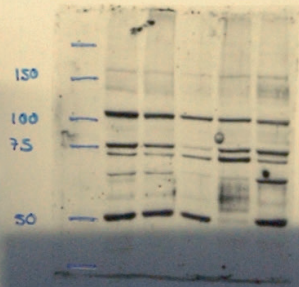


HeuBr. α
L10 α



HeuBr. β
p85 β
LC8





SCIENTIFIC SERVICES

Among the most important assets of the CNB are its core facilities. They provide access to leading-edge technology in the areas of structural and cell biology, genetically modified mouse and plant models, as well as for genomics, proteomics and bioinformatics. The centre also stands out for its research installations, which include a specific pathogen-free animal facility, a greenhouse, and one of the few high-level biocontainment (BSL-3) laboratories currently operative in Spain. Specialised personnel offer technical support in many other facets of the centre's scientific activities.

STRUCTURAL AND CELL BIOLOGY

Electron microscopy

Cristina Patiño

Cryoelectron microscopy

Rocío Arranz

Macromolecular X-ray crystallography

César Santiago

Confocal microscopy

Sylvia Gutiérrez

Flow cytometry

M^a Carmen Moreno-Ortiz

Protein tools

Leonor Kremer

GENETICALLY MODIFIED MOUSE AND PLANT MODELS

Transgenesis

Belén Pintado

Mouse embryo cryopreservation

Lluís Montoliu

Histology

Lluís Montoliu

***In vitro* plant culture**

Raquel Piqueras

GENOMICS, PROTEOMICS AND BIOINFORMATICS

Genomics

José Manuel Franco

Proteomics

Alberto Paradela

Bioinformatics for genomics and proteomics

Juan Carlos Oliveros

Scientific computing

José Ramón Valverde

Sequence analysis and structure prediction

Mónica Chagoyen

RESEARCH INSTALLATIONS

Animal facility

Ángel Naranjo

Greenhouse

Tomás Heras

Radioactive facility and biosafety level 3 laboratory

Fernando Usera

TECHNICAL SUPPORT

Biosafety and radiation protection

Fernando Usera

Cell culture, washing and sterilisation

Rosa María Bravo

Instrumentation

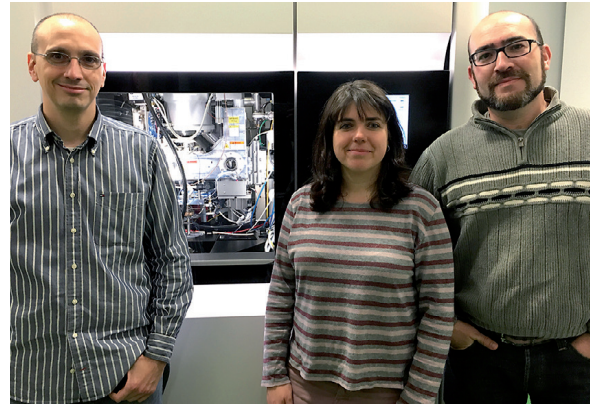
Ismael Gómez

Workshop

Daniel Pastora

Photography

Inés Poveda



Electron microscopy

HEAD

Cristina Patiño

PERSONNEL

Rocío San Andrés Cervilla
Javier Bueno Chamorro

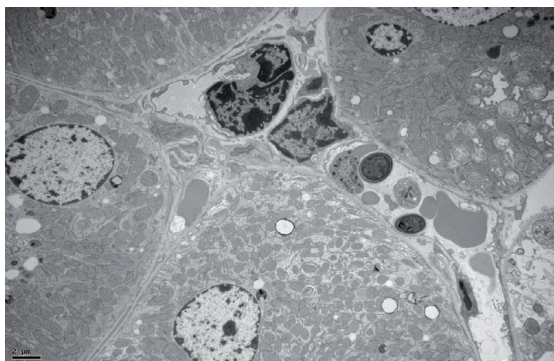
The transmission electron microscope (TEM) operates on many of the same optical principles as the light microscope, but uses electrons as the illumination source. Their much shorter wavelength makes it possible to obtain much higher resolution, which allows us to study ultrastructure of organelles, viruses and macromolecules.

The electron microscopy service offers equipment and techniques for the preparation and analysis of biological samples by transmission electron microscopy for studies at the ultrastructural, cytochemical and immunocytochemical levels.

The technical staff takes care of sample preparation, image acquisition and provides support for data interpretation. In addition, they offer training and advice to users in the use of equipment and available methodologies, as well as the implementation of advanced methods in microscopy.

Equipment

- Jeol JEM 1011 transmission electron microscope, equipped with a Gatan ES1000W camera
- Leica Ultracut UC6 cryo-ultramicrotome
- Reichert Ultracut E ultramicrotome
- Automatic cryo-substitution system Leica EM AFS2
- High-pressure system Leica EM PACT2
- Knifemaker Reichert
- Sample Trimmer Leica EM TRIM
- Carbon coating system Leica EM MED020



Cryoelectron microscopy

HEAD

Rocío Arranz

PERSONNEL

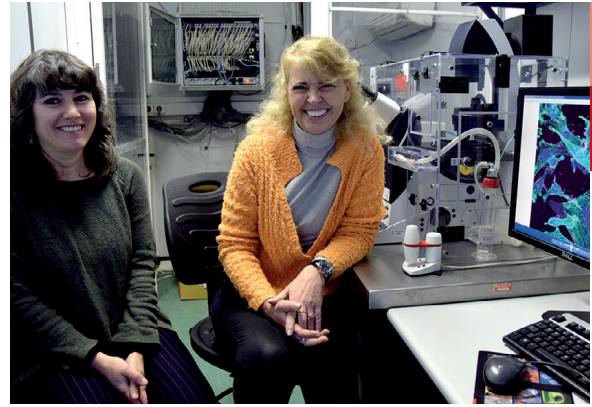
Francisco Javier Chichón
Rafael Núñez (CIB-CSIC)

The cryoelectron microscopy core facility is located at the Centro Nacional de Biotecnología (CNB-CSIC) and is jointly operated with the Centro de Investigaciones Biológicas (CIB-CSIC). The services offered by the facility include sample preparation and image collection for cryoelectron microscopy (single particle and tomography).

The facility provides access to two microscopes for cryoelectron microscopy of unstained biological material. One of them, a 200 kV FEI TALOS Arctica, equipped with an autoloader and with a Falcon II direct electron detector, is ideally suited for the collection of large amounts of high-resolution data. The other microscope, a 200 kV FEI Tecnai G2, equipped with a CCD camera, is available for general routine cryoEM.

The service also has two different apparatus for specimen vitrification, a FEI Vitrobot and a Leica EM CPC.





Macromolecular X-ray crystallography

HEAD

César Santiago

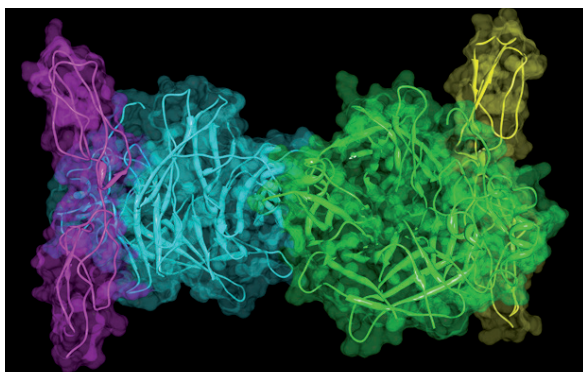
Protein X-ray crystallography is a high-resolution technique that allows us to study protein structure at the atomic level. This method provides a detailed view of protein function, ligand and protein interactions, supramolecular organization and mutants related to human diseases. Great improvements both in crystallization techniques and in software for structure resolution and refinement have been achieved in the last decade, which increase the possibility of solving a macromolecule's structure.

Services:

- Advice and supervision of protein production from cloning to expression in bacterial, yeast and eukaryotic systems
- Support and training in protein purification to obtain crystal-grade protein for crystallization
- Automated macromolecular crystallization
- Optimisation of crystallization conditions, applying standard and in-house techniques
- Crystal mounting, access to synchrotron beam time, X-ray diffraction data collection.
- Data processing, structure resolution and analysis

Equipment:

- Three temperature-controlled crystallization rooms
- Genesis RSP 150 workstation (Tecan Trading AG) nanodispenser robot
- Rigaku Desktop Minstrel system for automated visualisation of crystallization plates
- CrystalTrak database suite for crystallization screening and improvement of positive trials



Confocal microscopy

HEAD

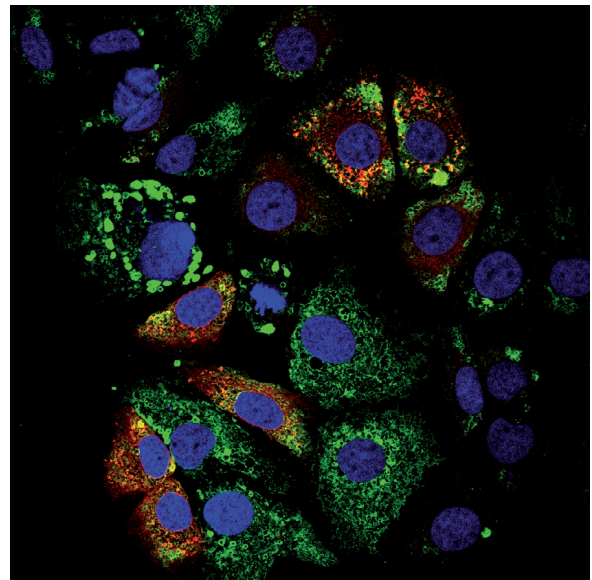
Sylvia Gutiérrez

TECHNICIAN

Ana Oña Blanco

Confocal microscopy imaging techniques use lasers and electronic systems of digital image capture to provide optical sections of the material. The presence of fluorescent markers in the sample allows location of cell components and use of various experimental approaches involving single or multiple fluorescent labelling in live or fixed cells and tissues.

The facility provides infrastructure for widefield, confocal laser scanning and STED super-resolution microscopy, covering most light microscopy applications, with technical assistance to its users. The equipment and services are available to CNB personnel as well as to researchers in the public and private sectors. The technical staff offers training and advice on equipment use, available methods, as well as image processing, quantification and analysis if required. Cell culture slides, aliquots of secondary antibodies and probes with broad use in fluorescence microscopy applications are also provided.





100

SCIENTIFIC SERVICES



Flow cytometry

HEAD

M^a Carmen Moreno-Ortiz

TECHNICIAN

Sara Isabel Escudero Garcia

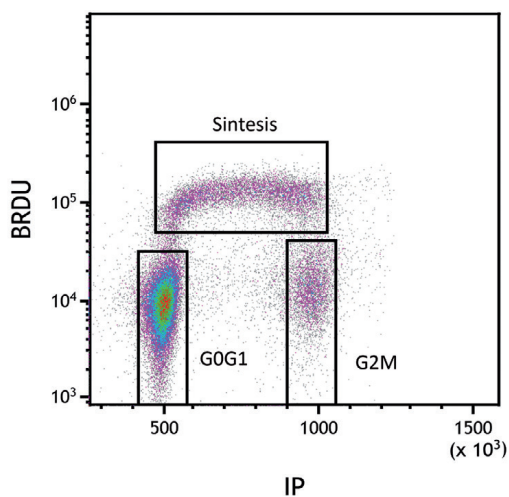
The flow cytometry facility provides scientific and technological support to CNB research groups and users from the public and private sectors.

Services

- Training and advice on the principles and applications of analytical flow cytometry
- Development and optimization of new applications, incorporating new technologies and reagents
- Quantification of secreted cytokines by multiplexed assays
- Analysis of results with specialized software packages
- Cell sorting
- Antibodies and commonly used reagents

Equipment

- BD FACSCalibur: 4 colours, 2 laser (488 nm and 633 nm)
- Beckman Coulter CYTOMICS FC 500: 5 colours, 2 lasers (488 nm and 633 nm)



Cytometric analysis of 293-T after BRDU in vitro incorporation.

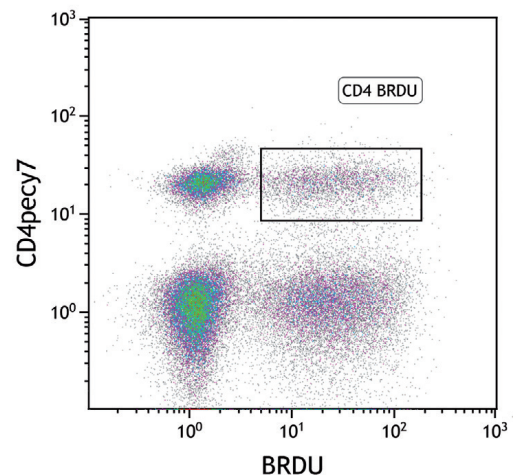
- Beckman Coulter CYTOMICS FC 500: 5 colours, 1 laser (488 nm)
- BD LSRII: 8 colours, 3 laser (488 nm, 633 nm and 405 nm)
- Beckman Coulter GALLIOS: 10 colours, 3 lasers (488 nm, 633 nm and 405 nm)
- Lumindex 100 IS Multiparametric Analyzer for quantification of multiple soluble molecules from a single sample
- Cell Sorter Beckman Coulter Moflow XDP: 10 colours, 3 lasers (488 nm, 633 nm and 405 nm)

The unit also provides 3 PC platforms to analyse results, running specialized software packages: WindMDI, CXP, MultiTime, MultiCycle, DIVA, FlowJo, Summit, Kaluza

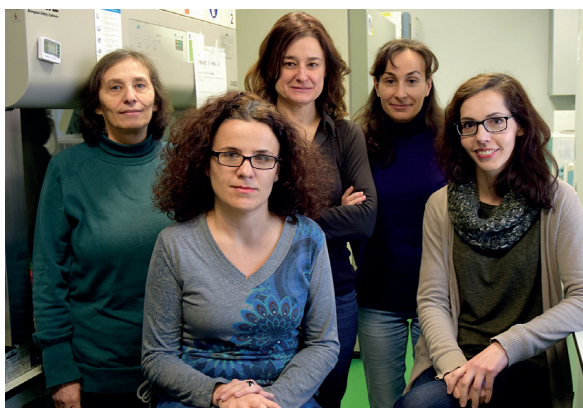
Common routine applications:

Cell viability (IP, 7AAD, DAPI); viability of fixed cells; cell cycle and ploidy (IP, DAPI); studies of mitotic G2/M population with phospho-histone 3; ploidy levels in plants (IP); proliferation assessment with BrdU or EdU; cell proliferation (CFSE, CellTrace); apoptosis (subG0/G1, annexin V, TUNEL); gene expression using fluorescent proteins; intracellular signalling (phosphoproteins); study of cell migration; intracellular calcium mobilization; immune phenotyping with 10 colours; study of T regulatory cells; intracellular cytokines; quantitation of soluble molecules such as cytokines by multiplexed assays; cell sorting

website: <http://www.cnb.csic.es/~citometria>



Cytometric analysis of homogenates spleen after oral BRDU (drinkable water) administration



Protein tools

HEAD

Leonor Kremer

PERSONNEL

María Teresa Martín
Mónica García-Gallo
María Lozano
Ana María García

The Protein Tools Unit generates and characterizes monoclonal antibodies, with emphasis on designing and developing immune response studies, immunoassays and molecular interaction analyses.

The unit is a founding member of EuroMAbNet, the first European non-profit organization of multidisciplinary academic laboratories specialized in mAb production, a framework for exchange of knowledge, methods and materials.

The facility provides research tools and services to scientists from the CNB, other CSIC institutes, universities, public research organizations and private companies.

In addition, we offer expertise, technical assistance, data analysis and interpretation, user training and the implementation of new methods. We also organize theoretical and practical courses, and assist with preparation of manuscripts and oral presentations. The

facility is equipped with a surface plasmon resonance biosensor (Biacore 3000), which allows sensitive, reliable characterization of biomolecular interactions and provides information such as kinetics and thermodynamic parameters of binding events.

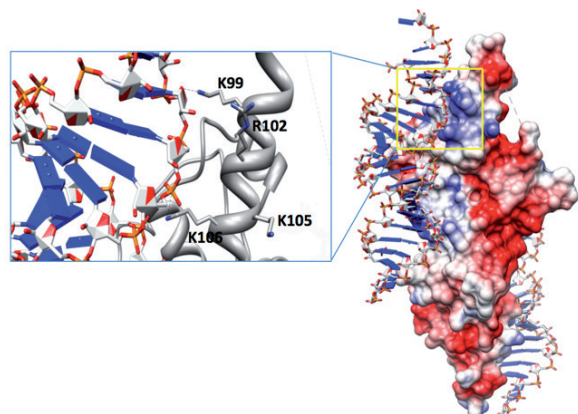
The biosensor has been used for applications that include antibody-antigen, protein-, nucleic acid-, lipid- and small molecule-protein interactions. In recent years, we have raised and characterized new monoclonal antibodies to viral proteins, toxins, protein hormones, immunoglobulins, blood proteins, chemokine receptors, and adhesion molecules.

Equipment

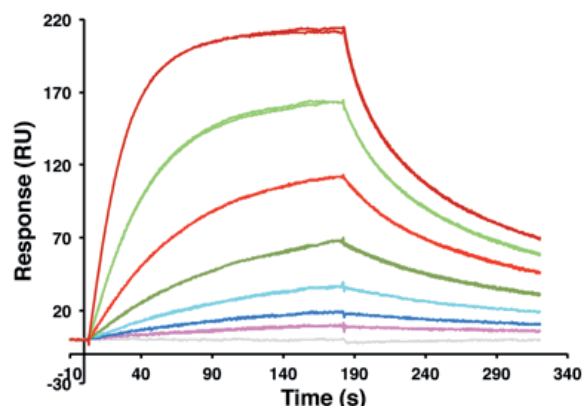
- ÄKTAprime plus chromatography system (GE Healthcare)
- SPR Biacore 3000 (GE Healthcare)
- EnVision 2104 Multilabel Reader (Perkin Elmer)
- Other equipment: biological safety cabinets, CO₂ incubators, centrifuges, microfuges, inverted fluorescence microscope (Zeiss Axiovert 40 CFL), thermal cycler, microplate reader, protein gel electrophoresis systems, Western blot systems and electrophoresis power supply units

Website:

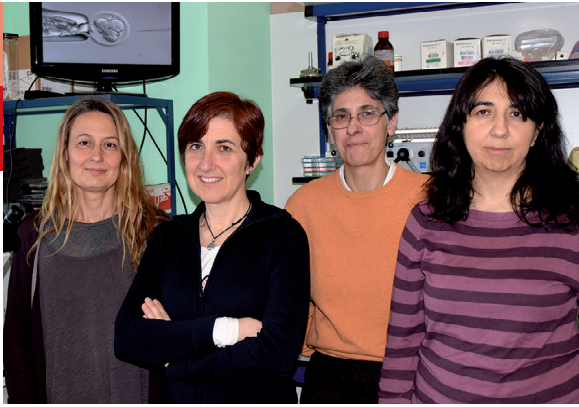
<http://www.cnb.csic.es/index.php/en/research/core-facilities/protein-tools-unit>



Interaction model of IBDV VP3 protein-dsRNA.



SPR analysis of VP3-dsRNA interaction using a Biacore 3000 biosensor.



Transgenesis

HEAD

M^a Belén Pintado

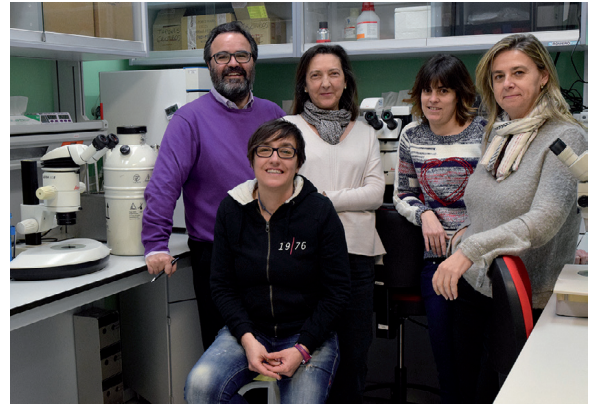
PERSONNEL

Verónica Domínguez Plaza (CBMSO-UAM)
Marta García Flores
Alicia Llorente Herranz

The CNB-CBMSO Transgenesis Core Facility provides support to researchers in the generation, establishment and interchange of genetically modified mouse models. The facility is a joint service shared between two centres: CNB and CBMSO. We offer technical and scientific support at all necessary steps on the best strategy to obtain the mouse model desired: generation of a genetically modified model and establishment and management of lines to achieve the desired genotype. We provide the necessary animal resources and technology by additive transgenesis, targeted mutagenesis (KO, KI) or genome editing (ZFN, CRISPR). The facility has two microinjection settings, including microinjectors and piezo drill, dissecting microscopes, plus a standard molecular biology laboratory and a fully equipped laboratory for ES cell handling. The unit has access to the animal facilities of the CBMSO and the CNB.

Services

- Advice on the design of target vectors or constructs for microinjection
- Pronuclear microinjection of plasmid, BAC and YAC DNA
- Vector electroporation into ES cell lines
- CRISPR/Cas9-based genome editing
- ES cell handling and injection to generate chimaeras
- Derivation of murine ES cell lines
- Embryo rederivation from external animal facilities
- Training in collection, handling and culture of mouse embryos in pre-implantation stages



Mouse embryo cryopreservation

HEAD

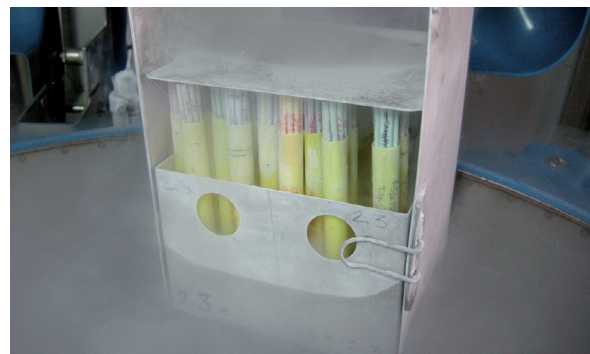
Lluís Montoliu

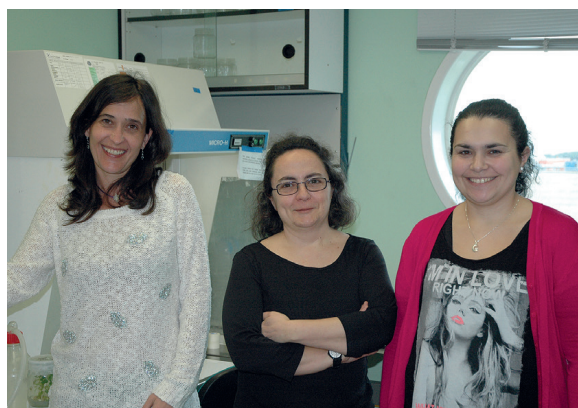
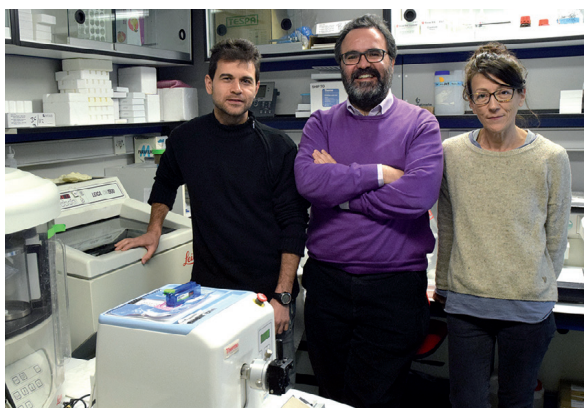
PERSONNEL

Julia Fernández Punzano
María Jesús del Hierro Sánchez
Marta Castrillo Labrado
Isabel Martín-Dorado Caballero

The CNB Mouse Embryo Cryopreservation Facility offers researchers the possibility to freeze and maintain transgenic and knockout mouse lines in the form of embryos and/or sperm, thus contributing to current animal welfare recommendations and complying with associated legislation. Additional methods available include thawing previously frozen sperm and/or embryos and revitalization of cryopreserved mouse lines, *in vitro* fertilization, assessment and/or logistical support for importing/exporting frozen or refrigerated embryos or sperm to and from the CNB, quality controls and genotyping procedures. The CNB hosts the Spanish node of the European project INFRAFRONTIER-EMMA, whose objective is the cryopreservation, organized archiving and coordinated distribution of mouse lines of interest for the scientific community. Through the CNB-CSIC, the CNB Mouse Embryo Cryopreservation Facility has signed scientific cooperation agreements with the CNIO, the University of Kumamoto, and is integrated in the scientific-technological platforms INNOTEK (UAM+CSIC) to allow the archiving and distribution of mutant mouse lines of interest in biomedical research.

Staff members of this CNB facility participate regularly as instructors in mouse cryopreservation workshops and courses, organized in collaboration with the CARD-University of Kumamoto, INFRAFRONTIER-EMMA, ISTT and CIEMAT-SECAL.





Histology

HEAD

Lluís Montoliu

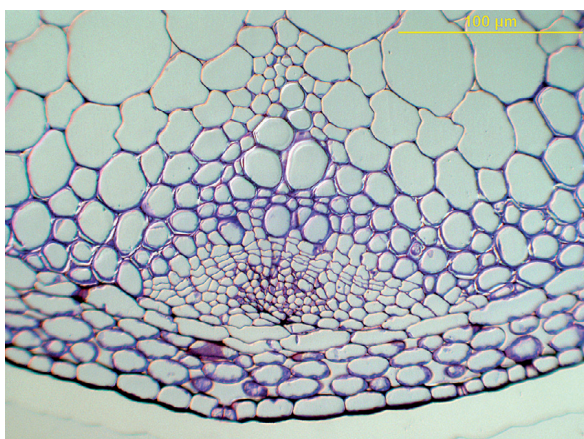
PERSONNEL

Soledad Montalbán
Oscar Sánchez

The CNB Histology Facility offers the preparation of animal and plant biological samples for histological analysis. All requests are processed electronically through the facility's web site, in Spanish or in English.

Available methods include preparation of wax and plastic (resin) blocks and the corresponding histological sections with the automated microtome. In addition, we offer preparation and sectioning of frozen blocks with a cryostat. All sections can be counterstained with any of the available staining procedures (haematoxylin/eosin, crystal violet, PAS, Mason's trichrome, elastin fibres/van Gieson, etc.) or can be used for immunohistochemistry. The facility can implement new staining procedures or additional histological methods on demand, according to user/researcher needs. The facility has ample experience in processing a large variety of animal and plant tissues and organs.

The CNB histology facility is integrated within the INNOTEK technological platform of the Campus of Excellence UAM+CSIC. It is associated with the IIB (Instituto de Investigaciones Biomédicas Alberto Sols)-UAM/CSIC histology facility —coordinated by the CNB— offering CNB and IIB researchers a large processing capacity for histological samples. The CNB histology facility has joined the SEFALer technological platform of the CIBERER/ISCIII.



In vitro plant culture

HEAD

Raquel Piqueras

PERSONNEL

María Luisa Peinado Vallejo
Beatriz Casal López

The CNB *in vitro* Plant Culture Facility offers technical expertise and maintains a variety of equipment necessary for:

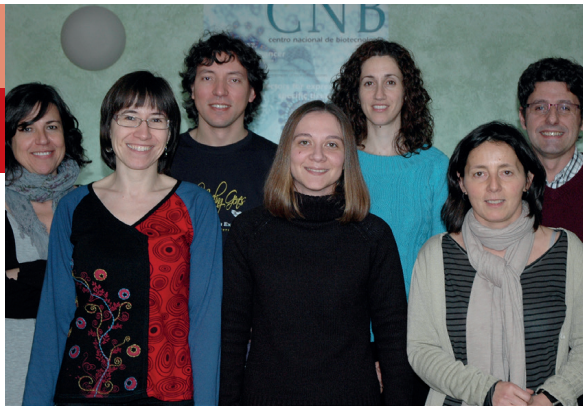
- sowing and growth of cells, tissues and seedlings of many plant species, including *Arabidopsis*, *Nicotiana sp*, tomato, potato and *Brassica sp*
- their maintenance and propagation
- generation of plant protoplast and cell cultures

The facility also assists in obtaining genetically modified plants by

- stable transformation of plants, using *Agrobacterium tumefaciens* as a transgene carrier
- transient transformation of plants using the particle delivery system

The CNB *in vitro* Plant Culture Facility provides service to any CNB researcher and works very closely with members of the Plant Molecular Genetics Department. With appropriate authorization, the facility also provides access to researchers from other academic institutions and companies.





Genomics

HEAD

José Manuel Franco

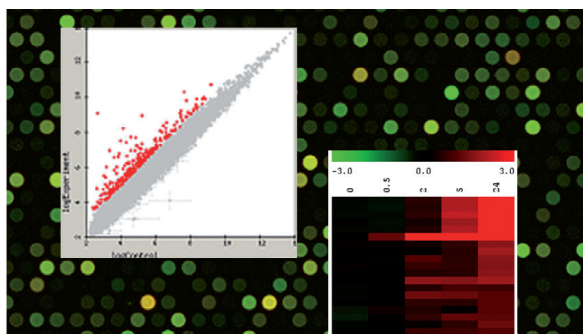
PERSONNEL

Gloria García Casado
Irene López-Vidriero
Marta Godoy
Luis Almonacid
Beatriz Martín

The CNB Genomics Facility focuses on the analysis of gene expression from biological samples using microarrays, interrogating the activity of complete genomes in a single experiment, and contributing to elucidation of the genetic basis of biological processes. We routinely hybridize and analyse one- and two-channel microarrays, including Agilent, Affymetrix and custom microarrays.

Our services include microarray printing and design, analysis of RNA integrity and microarray hybridizations. Raw data are analysed statistically using state-of-the-art algorithms, and filtered results are supplied to clients in an easy-to-use web-based tool developed by this facility. We offer support in the use of several bioinformatic tools for functional analysis, helping users with the biological interpretation of the results. We also offer the possibility of validating gene expression data by real time qPCR analysis. Through the Genomics Facility, the CNB participates in the CSIC-PCM ultrasequencing platform. This platform can perform massive sequencing experiments of complete genomes, transcriptomes, small RNAs or DNA/RNA-protein interactions.

Research projects are constantly being developed by our personnel, to implement new services and technologies for researchers; these include new microarray-based technologies such as a new DNA chip for studying DNA-protein interactions.



Proteomics

HEAD

Alberto Paradelo

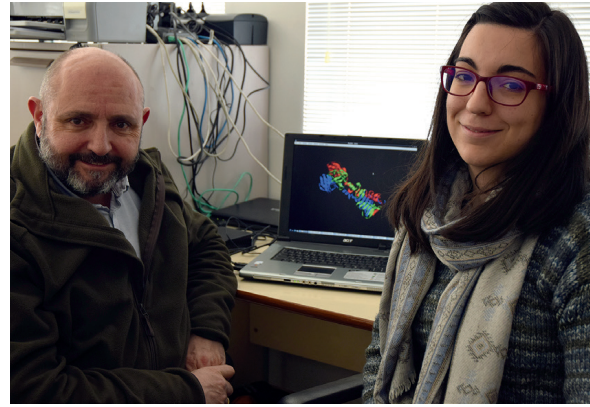
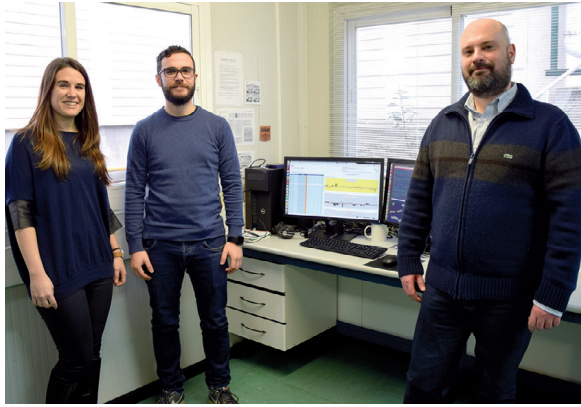
PERSONNEL

Adán Alpízar
Gema Bravo
Sergio Ciordia
Manuel Lombardía
Alberto Medina
Marí Carmen Mena
Rosana Navajas

Created in 1999, the CNB Proteomics Facility maintains a technological platform for large-scale protein identification, quantitation and characterization, offering its services to the CNB scientific community as well as to external researchers. Massive protein identification and characterization is performed by multidimensional nano-HPLC chromatography, coupled to a nano-electrospray ion trap mass spectrometer (MS), to a TripleQ-TOF MS, or to a MALDI TOF/TOF MS (LC-MS/MS). For differential proteomics (quantitative proteomics), we use label-free approaches or metabolic (SILAC)/chemical stable isotope labelling (ICPL, iTRAQ, TMT), in combination with LC-MS/MS analysis. We also offer targeted and, in combination with AQUA peptides, absolute quantitative protein analysis by selected/multiple reaction monitoring (S/MRM-MS). Phosphorylation analysis is performed through specific phosphopeptide enrichment procedures, followed by LC-MS/MS analysis with CID (collision-induced dissociation) or ETD (electron transfer dissociation) fragmentation methods. Prolamin detection and characterization by ELISA and mass spectrometry are also offered. For training purposes, we organize practical courses on topics such as quantitative proteomics and bioinformatics. The CNB Proteomics Facility is member of the Proteored-ISCI platform.

Services

- Two-dimensional gel electrophoresis
- Protein identification and characterization by MALDI-TOF/TOF, ESI-Q-TOF, ESI-QQQ and ESI ion trap mass spectrometry
- Protein quantitation by label-free approaches or after metabolic/chemical stable isotopic labelling (SILAC, ICPL, iTRAQ, TMT)
- Selected/multiple reaction monitoring (S/MRM-MS)
- Identification and characterization of post-translational modifications
- Peptide synthesis and membrane-bound peptide array design
- Gluten analysis by ELISA and mass spectrometry



Bioinformatics for genomics and proteomics (BioinfoGP)

HEAD

Juan Carlos Oliveros

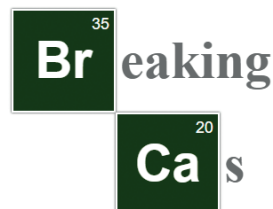
PERSONNEL

Daniel Tabas Madrid
Mònica Franch Sarto

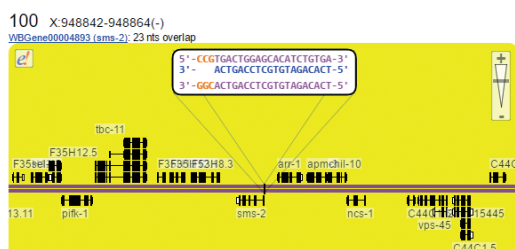
BioinfoGP provides bioinformatics support for the analysis, visualization and interpretation of genomics, transcriptomics and proteomics-related projects. Among other services, we offer:

- Assistance with experimental design for deep sequencing and DNA microarray experiments
- Biostatistical support for extracting quantitative results from genomics or proteomics projects
- Functional annotation of relevant lists of genes or proteins
- Periodic courses and tutorials on bioinformatics

We are continuously learning about new technologies and protocols to help our users to get the most out of their valuable data. An important practical challenge today is to integrate heterogeneous and large “omics” datasets into meaningful information that gives rise to new hypotheses. New proteogenomics approaches will allow researchers to improve protein identification and quantification by combining mass spectrometry with genome-wide RNA- or DNA-seq data and vice versa. In short, at BioinfoGP we try to fill the gap between the complex outcome of the many powerful biostatistical methods available and the researcher’s final needs.



[Export Targets](#) (text-tabulated format)



Scientific computing

HEAD

José Ramón Valverde

The CNB Scientific Computing service provides advanced support for scientific data analysis in bioinformatics and biocomputing, through close collaboration with research groups to tailor analyses to specific problems and through courses and collaborations with international institutions.

Bioinformatics data analyses have evolved from generic support to modern NGS data analyses, including metagenomics and de novo genome sequencing. We recently participated in studies to analyse pesticide effects on the maize rhizosphere, identify ecological indicators, sequence new bacterial strains (*Mycobacteria*, enteropathogenic *Escherichia coli*, *Citrobacter*) and construct metabolic networks to improve biotechnological processes in *Streptomyces lividans*.

The service provides support for advanced biostatistical analyses, which has allowed treatment of complex experimental setups associated with new therapies, bladder cancer diagnosis, proteomics and non-linear longitudinal analyses, as well as in our International Course on Biostatistics and a new R programming course.

Computational biology services include pocket identification, molecular docking, drug screening, in silico mutagenesis, molecular dynamics, QM and QM/MM models, quantum dynamics and reaction modelling. Using these technologies, we identified the role of several human growth hormone mutants, selected natural compounds to target cancer stem cells, and resolved the phosphotransfer reaction mechanisms of the ζ protein in the bacterial ϵ - ζ complex.

Expertise in computer programming is available in manycomputer languages (C, Fortran, R, Perl, Python, PHP, SQL, and more) for generation of dedicated software to solve specific scientific needs. This expertise is shared through periodic courses offered at the CNB such as the International Courses on Python or R. The service collaborates with CNB groups and external institutions. We have coordinated and participated in many international Networks of Excellence and in EU CBRN Centers of Excellence P35. We also collaborate with external institutions in academic activities such as lectures and training of graduate and master’s students (University of Alcalá de Henares, Polytechnical University of Madrid, University of Colombo-Sri Lanka), in risk management courses in Africa, and other training activities organized by European, Latin American, Asian and African institutions.



Sequence analysis and structure prediction

HEAD

Mónica Chagoyen

Sequence analysis and protein structure prediction methods can explain, simplify and further guide experimental work. We specialize in ad hoc analysis of protein sequences to solve specific problems or questions.

In our analysis we commonly:

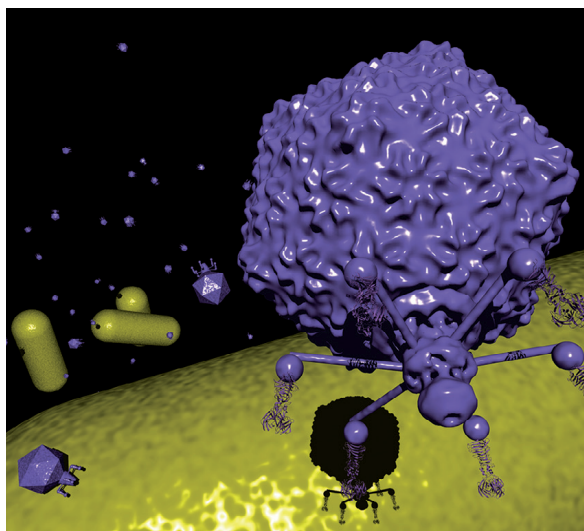
- predict protein structure
- search for homologous proteins
- generate multiple sequence alignments
- produce structural organization drafts
- study relevant residues for protein structure/function
- extract sequence features from full proteomes

Additional services include:

- DNA/RNA motif discovery
- consultancy on the use of sequence-based methods
- generation of high-quality protein sequence/structure images for publication

In collaboration with other CNB services, we also organize periodic courses on bioinformatics approaches for sequence analysis and protein structure prediction.

We offer our services to the CNB as well as to other academic institutions and private organizations.



Animal facility

HEAD

Ángel Naranjo

RESEARCH TECHNICIAN

Javier Martín

SHIPMENT COORDINATOR AND ADMINISTRATION

Alberto García

AREA AND COLONY MANAGERS

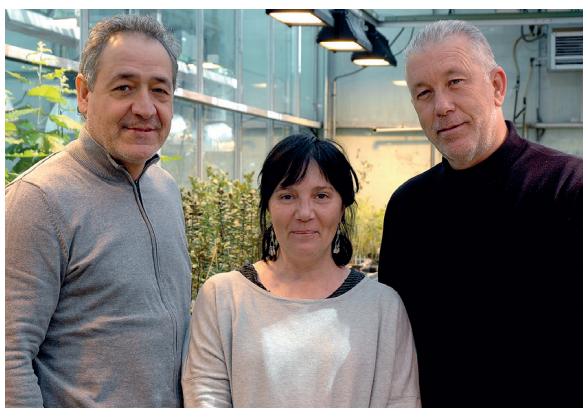
Antonio Morales
Raquel Gutiérrez
Eladio Martínez

ANIMAL TECHNICIANS

Sergio Magallón
Ruví Jaramillo
Lola García
Ivan Jareño
Raquel Castañera

The Laboratory Animal Facility is an area dedicated to the production and maintenance of experimental animals, aiding in research, essential techniques, and legal support for this duty. Most experimentation is carried out using genetically modified mice. The laboratory animal service provides a controlled environment for the animals, with periodic control of diet, water, temperature, air, housing, and husbandry conditions. The unit is separated into several areas: quarantine, conventional, and specific pathogen-free (SPF), depending on the microbiological status of the animals. We provide special housing conditions for conventional, genetically modified, and immunodeficient animals, depending on the experimental objectives. A totally isolated biosafety area is dedicated to *in vivo* experiments using biological agents.

The animal facility staff gives service to laboratories for obtaining commercial lines and strains of animals, shipping animals for collaboration with other institutes, as well as maintenance, breeding, and generation of transgenic, knock-out and knock-in animals. These services allow control of the microbiological and genetic quality of the animals used in experimentation. The animal facility staff provides services for various techniques used in mouse research models, research assistance in surgical techniques, selection of animal models, animal health surveillance, laboratory animal care, and animal well-being. We also organize courses for continued education, for accreditation for work with animals, and to manage colonies of genetically modified animals. Our goal is to achieve research excellence following the 3R principles: reduction, refinement, and replacement of animal experiments.



Greenhouse

HEAD

Tomás Heras

PERSONNEL

Alejandro Barrasa Fustes
Esperanza Parrilla Carrillo

The greenhouse facility manages the following installations for plant cultivation:

- standard greenhouse with 8 cabinets (total growth surface: 180 m²)
- P2 safety level greenhouse with 4 cabinets (total growth surface: 83 m²)
- 18 climate chambers

The greenhouse facility offers the following services:

- growth and propagation of plants under controlled environmental conditions
- growth and propagation of mutant and transgenic lines under controlled environmental conditions
- identification, selection and phenotypic analysis of mutant and transgenic plants



Radioactive facility and biosafety level 3 laboratory

HEAD

Fernando Usera

PERSONNEL

María Teresa Bartolomé Jiménez
Aranzazu de la Encina Valencia
Jessica Gaspar Navarro

We directly operate the centre's gamma irradiator, radioactive facility and biosafety level 3 laboratory.

Radioactive facility

The CNB radioactive facility is a category 2, non-encapsulated source type installation, equipped with all required means of shielding, containment and detection of ionizing radiation. For its users, the following equipment is available:

- two cabinets for radioisotopes beta and gamma
- biosafety class IIA cabinet
- CO₂ incubator
- ultracentrifuge
- centrifuges and microfuges
- vacuum concentrator (SpeedVac)
- hybridization oven

Biosafety level 3 laboratory

The laboratory has three sub-laboratories with all necessary equipment for safely handling of risk group 3 biological agents. The installation is equipped with:

- three biosafety class IIA cabinets
- three cell culture incubators
- microbiological culture incubator
- refrigerated ultracentrifuge
- three bench-top refrigerated centrifuges
- three refrigerated microfuges
- three inverted optical microscopes
- liquid nitrogen tank with capacity for 6000 samples
- double door steam sterilizer
- SAS for biological inactivation of small items
- SAS for biological inactivation of large items
- four ultra-freezers (-80°C)
- data transmission network (computers and telephone)
- several alarm systems to alert of incidents, accidents or malfunction



107

SCIENTIFIC SERVICES



Biosafety and radiation protection

HEAD

Fernando Usera

PERSONNEL

María Teresa Bartolomé Jiménez
Aranzazu de la Encina Valencia
Jessica Gaspar Navarro

Services:

- Evaluation of biological, chemical and radiological risks
- Management of official authorizations for research facilities
- Management of the acquisition of radioisotopes and equipment for protection
- Design of laboratories and other facilities potentially exposed to risks
- Issuing of the CNB Basic Guide, the CNB Safety & Health Manual and other safety guidelines and standard operating procedures
- Training of personnel related to specific risks in research laboratories
- Control of compliance with safety and health rules related to research activities
- Management of medical and dosimetry records of exposed laboratory personnel
- Management of accidents and emergency situations following established procedures
- Managing of biological, toxic and radioactive waste



Cell culture, washing and sterilization

HEAD

Rosa María Bravo

CELL CULTURE

Ana Montero
Concepción Cobeña Chivato
Sonia Rodríguez Murcia

WASHING AND STERILIZATION

Anunciación Romero
Margarita Felipe Hombrados
Josefa Pérez Alfaro
Carlos Enríquez Casas
Arancha Rodríguez Martínez
Carmen Berdeal Mera
Ángeles Sánchez Pérez
Ana Isabel Nieto Jiménez
Rosa Ramos Hernández
Ángel Valera López
Esther Dorado Alcusión

Services:

- Preparation of cell culture media
- Routine cell culture procedures
- Washing, sterilization and replacement of laboratory material



Workshop

HEAD

Daniel Pastora

Services:

- Machining metal and plastic parts
- Custom manufacture of metal structures
- Welding and repair of steel carts

Equipment:

- Parallel lathe
- Milling machine
- Power welding set
- Spot welding equipment
- Mitre saw
- Reciprocating saw
- Automatic slitter
- Bending machine
- Grinding machine
- Column drilling machine

Instrumentation

HEAD

Ismael Gómez

PERSONNEL

Juan Ignacio Golpe de la Fuente
Carlos González Redondo
Rodrigo López Manzano

Services:

- Calibration and validation of scientific instrumentation
- Maintenance and repair of scientific instrumentation
- Technical advice during the acquisition of scientific-technical equipment
- Supervision of the installation of scientific-technical equipment
- User training for scientific-technical equipment

Photography

HEAD

Inés Poveda

The CNB Photography Service supports scientists with the photographic material necessary for their research and the dissemination of their results.

Photos are taken on a reprographic table with continuous lighting or with studio flashes against an adjustable background, and illumination with white or ultraviolet light, as needed.

The Photography Service also manages image processing and, when required, photo retouching; digital images are made accessible to clients on dedicated servers.

The service offers digital colour printing of large format posters and, on request, also provides advice for graphic and image design.