

Research Support

Mouse Embryo Cryopreservation Facility



LEAD INVESTIGATOR

Lluís Montoliu

PERSONNEL

Julia Fernández Punzano
María Jesús del Hierro Sánchez
Óscar Javier Sánchez Sánchez
Marta Castrillo Labrador

The Facility currently offers the following services: freezing 8-cell mouse embryos, freezing IVF-derived 2-cell mouse embryos, thawing mouse embryos and associated embryo transfer procedures to pseudopregnant females for revitalisation of mouse lines, freezing mouse sperm, thawing mouse sperm and in vitro fertilization (IVF), storage of cryopreserved mouse embryos or sperm in liquid nitrogen. A variety of cryopreservation methods and cryopreserving agents are studied and tested to optimise and apply the most up-to-date, efficient protocols. On request, we teach mouse cryopreservation techniques to interested visiting scientists and technicians.

The CNB also hosts the Spanish node of the European project EMMA (European Mouse Mutant Archive, www.emmanet.org), under the coordination of Dr. Lluís Montoliu,

whose objective is the cryopreservation, organised archiving and coordinated distribution of mouse lines of interest to the biomedical scientific community. The current EMMA project, EMMAservice (2009-2012), funded by the European Commission (7th Framework Program), began in January 2009 with a kick-off meeting held at the CNB/CSIC in Madrid (16-17 March 2009), with delegates from all EMMA nodes. Another EMMA meeting dedicated to cryopreservation technology was held at the CNB (18-19 January 2010). EMMA procedures allow the free cryopreservation of mouse lines, and the researcher/submitter need only cover the expenses of shipping mice to the CNB. Researchers can request a grace period of up to 2 years and can include a Material Transfer Agreement associated to the mouse line deposited in EMMA. Distribution of mouse mutant lines cryopreserved at EMMA nodes is associated with the payment of a repository fee. All researchers are given the choice of depositing their mouse mutant lines in EMMA, the first recommended option, or privately within the CNB mouse embryo cryopreservation stocks.

Associated to the EMMA node, the CNB also hosts the Madrid node of the European ESFRI Project INFRAFRONTIER (www.infrafrontier.eu), coordinated by Dr. Lluís Montoliu, which develops infrastructures for large-scale phenotyping and archiving of mouse mutant lines in Europe.

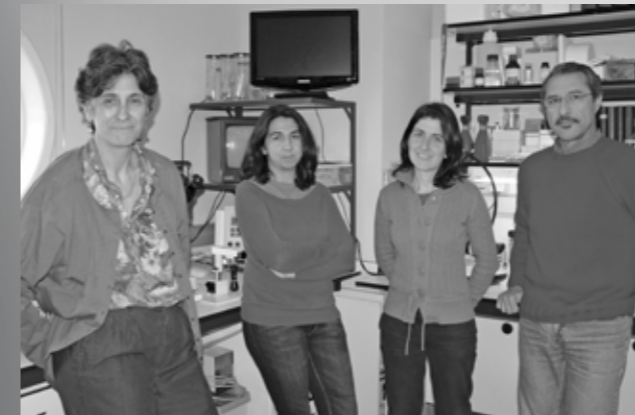
Transgenesis

LEAD INVESTIGATOR

M^a Belén Pintado Sanjuanbenito

PERSONNEL

Alfredo Serrano Montalbo
Marta García Flores
Veronica Dominguez Plaza



Our aim is to determine the molecular bases of the interaction of macromolecules and macromolecular complexes to yield functional biological machineries. We have centred our interest on the way viral proteins assemble into intermediate structures that are further matured to yield fully infective viral particles. Our model systems are bacteriophages (T7 and Φ 29), and eukaryotic viruses such as vaccinia. Using bacteriophages, we have reached subnanometer resolution by electron cryo-microscopy and three-dimensional reconstruction. The combination of these structures with computational modelling has led to the definition of the molecular basis of capsid expansion and stabilization characteristic of certain virus families.

The unit provides the following services:

- Advise in the design of target vectors or constructs for microinjection
- Pronuclear microinjection of plasmidic, BAC or YAC DNA
- Vector electroporation in R1 or G4 ES cell lines
- International consortium ES cells handling and injection to generate chimeras
- Embryo rederivation through IVF or embryo transfer
- DNA purification and founder identification by PCR upon request
- Reproductive biotechnology to solve breeding problems of genetically modified mice.

These activities are combined with training and education on demand and applied research to develop and refine reproductive technologies in order to enhance transgenic production efficiency

Specialized Equipment List:

Two microinjection settings with Narishige micromanipulation system and Eppendorf femtojet injector. Two dissecting microscopes.

- De Fonbrune microforge.
- CO2 incubator and biosecurity hood.
- Pipette puller Termociclator and electrophoresis equipment.



scientific & technical services

Research Support

LEAD INVESTIGATOR

Carlos Alonso Blanco

PERSONNEL

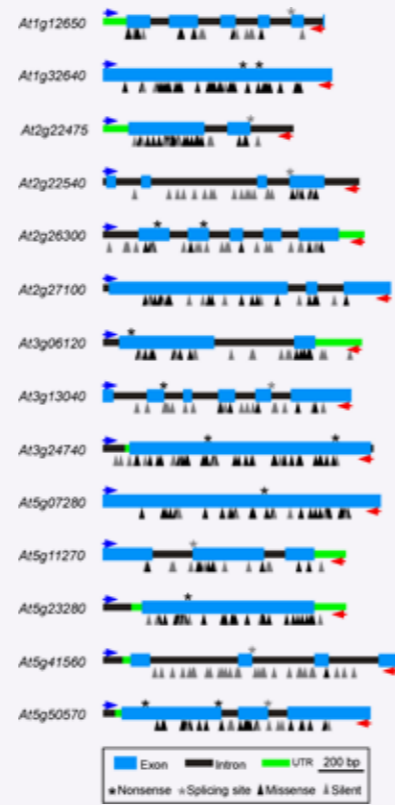
José M. Martínez-Zapater
Beatriz Martín Jouve



TILLer Service is an international public service for the search of EMS induced mutants in the model plant *Arabidopsis thaliana*. TILLer is available through the web page <http://www.cnb.csic.es/~tiller> or through the international Arabidopsis web page (<http://www.Arabidopsis.org/>).

During the past four years TILLer Service has searched for chemically induced mutants by applying TILLING (Targeting Induced Local Lesions in Genomes) technique in an EMS collection of 3712 mutants developed by the service for such purpose (Martin et al., 2009). Up to now, the Service has searched for mutants in more than 20 genes derived from applications from several countries and it has identified more than 500 mutants in those genes.

TILLer Service



14 gene fragments analyzed and mutations found in TILLer collection.

LEAD INVESTIGATOR

José Manuel Franco

CSIC-PCM Ultrasequencing Platform

CNB participates in the CSIC-PCM Ultrasequencing Platform that has recently incorporated two different deep sequencing systems for the analysis of genomes, Genome Analyzer Iix (illumina) and Genome Sequencer FLX (Roche).

Both systems have different but complementary characteristics that guarantee virtually any application involving the analysis of genomes. The number of genomic applications using these systems is almost unlimited, and include the sequencing "de novo" of small and large genomes and massive sequencing of amplicons (specially suitable for the GS FLX system) and all the applications involving resequencing of genomes with the GAllx system, such as sequencing of crop varieties, identification of SNPs for agriculture of diagnostic studies, quantitative and qualitative analysis of transcriptomes including small RNAs, epigenetic studies and the identification of small RNAs and protein-DNA/RNA interactions.

The CNB Genomics Unit also offers computing support for secondary analysis of the results for several applications involving deep sequencing.



Bioinformatics Initiative

LEAD INVESTIGATOR

Alberto Pascual-Montano

PERSONNEL

Juan Carlos Oliveros Alberto Medina
Mónica Chagoyen Quiles José R. Valverde



To improve the visibility and coordination of the existing bioinformatics services at the CNB, the centre has promoted the creation of the Bioinformatics Initiative. The aim of this initiative is to conduct collaborative research and to provide coordinated analysis services to all research groups at the CNB. The Bioinformatics Initiative is composed of four different services:

- Computational Genomics: This service is part of the Genomics Unit and provides bioinformatic support for the analysis, visualisation and interpretation of genomics-related projects, including microarrays and next-generation sequencing.
- Sequence Analysis and Structure Prediction Service: Provides bioinformatic support for sequence and structural prediction topics
- Scientific Computing Service: Covers general

scientific data analysis needs of the CNB and maintenance of the national EMBnet node

- Computational Proteomics: This service is part of the Proteomics Facility and provides interpretation, validation and reporting of data derived from proteomics experiments.

In addition to these services, the Bioinformatics Initiative also includes a set of bioinformatics research groups that can be contacted for collaborative projects:

- Biocomputing Unit
- Functional Bioinformatics
- Image Processing and Statistical Analysis
- Computational Methods for Electron Tomography
- Logic of Genomics Systems Laboratory

Scientific Computing Service

The tasks assumed by the SCS are renewed continuously, adapting to CNB needs. Services are provided using free software tools on CNB and external hardware, and include:

LEAD INVESTIGATOR

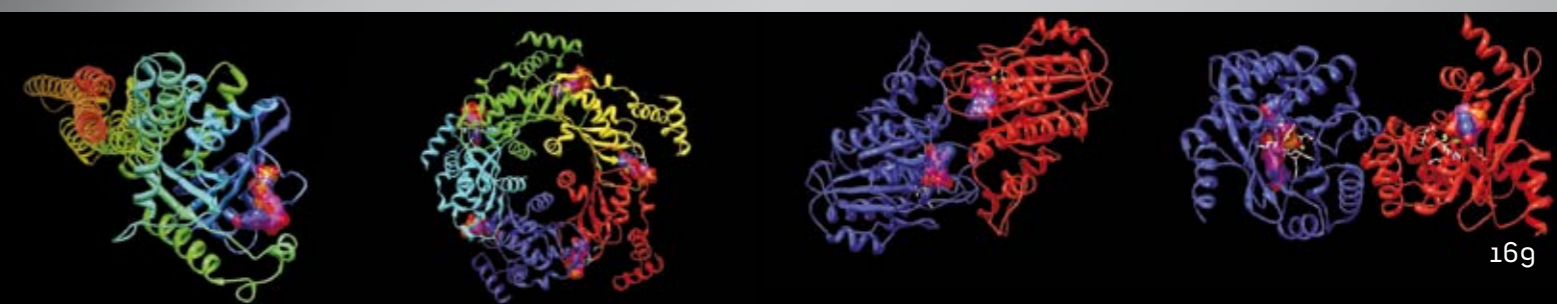
José Ramón Valverde



- Support of advanced scientific computing environments such as clusters and grid at the CNB, CSIC, CESGA and EGEE
- Maintenance of the Spanish EMBnet node:
 - User support and development of data analysis tools and web services
 - Coordination with international bioinformatics networks and institutions
 - Coordination within the CNB to deliver and organize specialized training e-Learning
- Phylogenetic Analysis (comparison, trees, reliability)
- Molecular simulations:
 - Molecular dynamics
 - Docking and macromolecular interactions
 - Computational chemistry (chemical properties, reaction modelling, quantum biology)
- Biostatistics support
- Tertiary analysis of next generation sequencing (NGS) data

The SCS maintains centralised computing infrastructures for all CNB scientists and can provide maintenance and help in supporting group-specific computing infrastructures when needed. Assistance is also offered for experiment and project planning, as well as for customised highly specialized data analysis.

Major recent collaborations include high-throughput genome sequencing, metagenomics, organism classification and OUT-based analysis, analysis of macromolecular interactions of GTP related compounds, coordination of CYTED FreeBIT network, involvement in an NGS data analysis COST action, etc.





Research Support

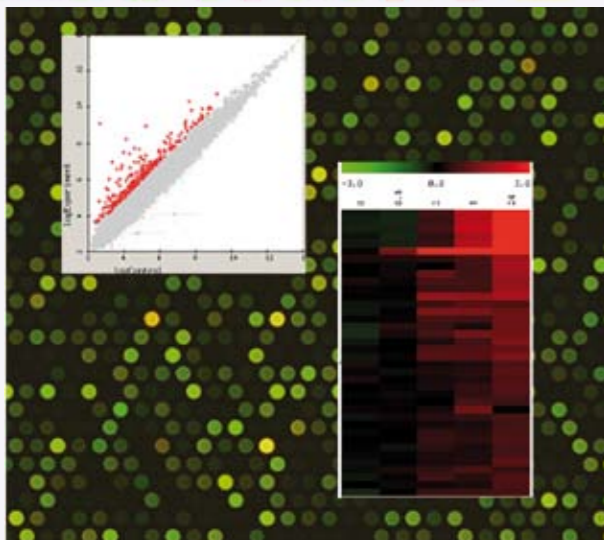
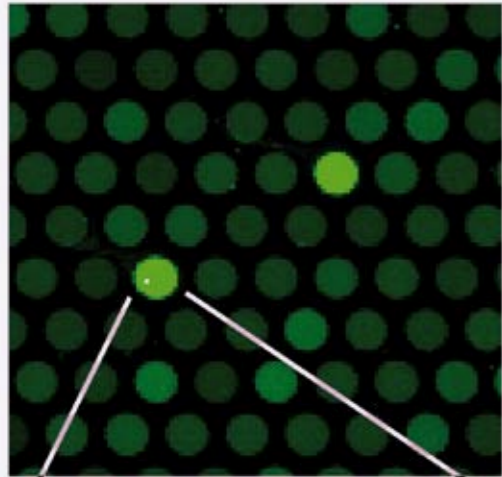
LEAD INVESTIGATOR

José Manuel Franco Zorrilla

PERSONNEL

Gloria García Casado
Irene López-Vidriero
Juan Antonio García
Iria Calvete

Juan Carlos Oliveros
Marta Godoy
Juana María González
Eduardo Gil



Genomics Unit

The Genomics Unit at the CNB focuses on gene expression analysis using microarrays (or DNA “chips”). This technology allows the comparison of gene expression in different biological samples, interrogating the activity of thousands of genes or complete genomes at once, which will contribute to the elucidation of the genetic basis of the biological processes under study. We routinely hybridise and analyse one- and two-channel microarrays. The platforms we support now include Affymetrix, Agilent and NimbleGen, as well as custom microarrays.

We offer services to the CNB and to external researchers, including microarray printing, RNA integrity analysis and microarray hybridisation. We also provide statistical analysis and bioinformatic support. Raw data are analysed statistically using state-of-the-art algorithms, and filtered results are supplied to users in a easy-to-use web-based tool developed by this Unit. We offer advice and support in the use of several bioinformatic tools for functional analysis of genes and genomes, helping users in the biological interpretation of the results.

Research projects are constantly being developed by our personnel, to implement new services and technologies for users. These include new microarray-based technologies such as a new DNA chip for studying DNA-protein interactions, analysis of transcriptome and new strategies for analysis of miRNA-guided degradome.

Equipment

- Complete Affymetrix platform, including fluidics station, hybridisation oven and scanner (3000 7G)
- High-resolution scanner for 1- and 2-colour microarrays (Agilent Microarray Scanner)
- Hybridisation system for NimbleGen microrarrays
- Microarray spotter MicroGrid II (Genomic Solutions)
- Bioanalyzer 2100 (Agilent) for analysis of RNA/DNA sample integrity
- Automated liquid-handling workstation (Biomek 2000, Beckman Coulter)
- Laser scanner for two-colour microarrays (Axon 4000B)

Sequence Analysis & Structure Prediction

Sequence analysis and protein structure prediction have proven very useful tools for molecular biology. These approaches, which can be applied in a wide-ranging manner to many areas, can reduce experimental work if well used. Starting from the primary sequence of a gene, these tools can provide data on evolution, functional/structural domain organisation, functionally relevant regions or residues, functional hypotheses, possible subcellular localisation, interactions with other genes, structural models, etc. The main function of the service is to give bioinformatic support for sequence analysis and protein structure prediction, including:

- Localisation of homologous genes within different genomes, totally or partially sequenced, using high-sensitivity methods
- Generation of high quality multiple sequence alignments
- Evolution analysis: gene distribution within organisms/kingdoms, phylogenetic tree generation, etc.
- Subcellular localisation prediction
- Structural/functional domain localisation
- Prediction of functionally relevant residues or regions

- Prediction of post-translational modification sites (phosphorylation, glycosylation, etc.)
- Prediction of interaction sites
- Prediction of functional relationships with other genes by context methods (not homology-based)
- Prediction of physical/functional interactions
- Generation of structural organisation drafts: globular domain localisation, unstructured regions, coiled-coil, transmembrane regions, etc.
- Secondary structure prediction
- 3D structure prediction for close and remote homology
 - Generation of high-quality structural representations for publication

LEAD INVESTIGATOR

Florencio Pazos Cabaleiro

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Monica Chagoyen Quiles
Juan Carlos Sanchez Ferrero

Proteomics Facility



LEAD INVESTIGATOR

Juan Pablo Albar

PERSONNEL

Alberto Paradela	Rosana Navajas
Silvia Juarez	Sergio Ciordia
Marisol Fernandez	Fernando Roncal
Alberto Medina	

The CNB Proteomics Facility (created in 1999) aims to develop a technological platform suitable for large-scale protein identification and characterization, offering its services to the CNB scientific community as well as to external researchers.

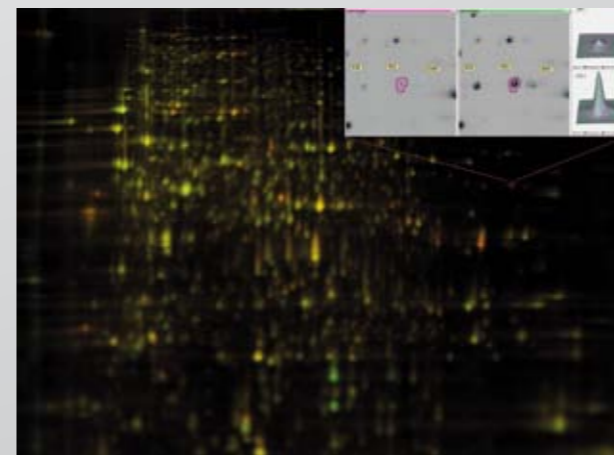
Massive protein identification and characterization is performed through multidimensional nano-HPLC chromatography coupled to either a nano-electrospray ion trap or to a MALDI TOF/TOF mass spectrometer (LC-MS/MS). Comparison between complex proteomes (differential proteomics) is done through the analysis of fluorescent-labeled samples and differential 2D-electrophoresis followed by software-aided sample analysis (2D-DIGE) as well as through the use of isotope stable tags (ICPL, SILAC, iTRAQ) in combination with LC-MS/MS. SELDI-ToF MS (Surface enhanced laser desorption-ionization-time of flight mass spectrometry) is used to obtain protein expression profiles.

For educational purposes, we organize practical courses on topics such as Quantitative Proteomics or bioinformatics. The organization of our lab is described in more detail in: <http://proteo.cnb.csic.es>. Finally, the head of the CNB Proteomics facility (Dr J.P. Albar) is the

General Coordinator of Proteored (National Institute for Proteomics; <http://www.proteored.org>).

Services:

- Two-dimensional electrophoresis/Differential proteomics (2D-DIGE).
- Protein Identification and characterization by MALDI-TOF/TOF, ProteinChip/ SELDI-TOF and/or ESI MS/MS mass spectrometry.
- Protein profiling, purification and biomarker determination by SELDI-TOF MS.
- Identification and characterization of posttranslational modifications.
- Peptide Synthesis and Membrane-bound peptide arrays design.





Confocal Microscopy Service (SMC)

Confocal microscopy imaging techniques provide optical sections of material to observe using lasers and electronic systems of digital image capture. Fluorescent labelling of the sample allows the location of cell components in single sections. In addition, diverse experimental approaches involve single or multiple fluorescent labelling in fixed cells and tissues.

The SMC provides infrastructure for fluorescence, confocal laser scanning microscopy and image processing tools, covering most light microscopy applications, with technical assistance to all users. The equipment and services are available to all CNB personnel as well as to researchers from the public and private sectors.

The technical staff offers formation and advice about equipment use, available methodologies, and for image processing, quantification and later analysis, if required. Aliquots of secondary antibodies and probes with broad use in fluorescence microscopy applications are also provided.

The facility's equipment includes:

- Confocal multispectral Leica TCS SP5 system. Laser lines: 405, 458, 476, 488, 514, 561, 594 and 633 nm, with incubation system for in vivo studies
- BioRad Radiance 2100 confocal system. Laser lines: 457, 476, 488, 514, 543 and 637 nm
- Fluorescence microscope Leica DMI6000B with incubation system for in vivo studies and OrcaR2 monochrome digital camera for image detection
- Two epifluorescence microscopes (Leica DMRXA and Zeiss Axiophot) with colour digital cameras and one Leica stereomicroscope

The unit also provides offline computer workstations for fluorescence and confocal image processing and analysis (LAS AF, MetaMorph, Image J, Laser Pix, Huygens). Auxiliary equipment includes a CO2 incubator, centrifuge, laminar flow chamber, and freezer.

Applications available:

- Laser scanning confocal microscopy
 - Multichannel confocal imaging + transmission imaging of living cells or fixed samples (2D, 3D, 4D imaging)
 - High speed confocal microscopy
 - Multidimensional in vivo time-lapse experiments
 - FRET, FRAP, photoactivation, photoswitching, lambda scan, calcium imaging
 - Subcellular colocalisation studies
- Wide-field microscopy
 - Multichannel fluorescence imaging + transmission imaging (BF, DIC, phase contrast)
 - Multidimensional in vivo time-lapse experiments (wound healing, infection, etc.)
 - Tile scan imaging

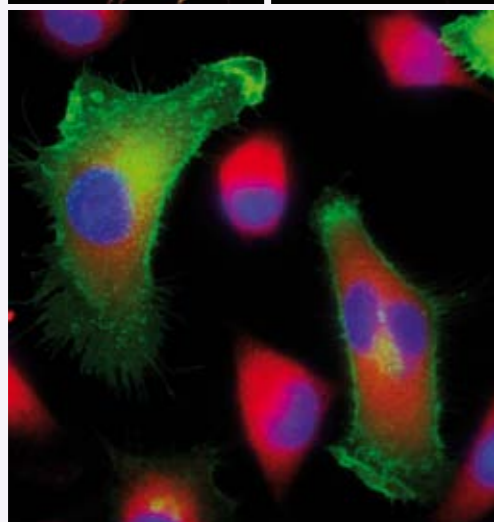
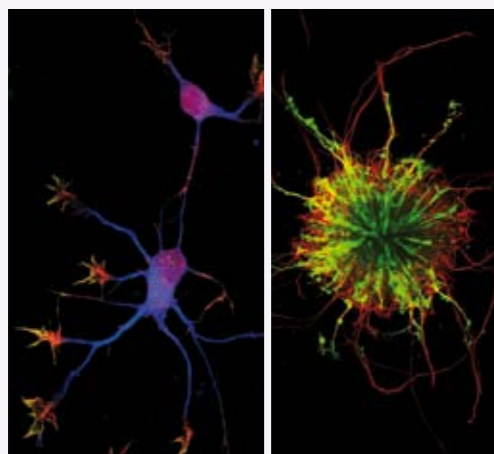


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Sylvia Gutiérrez Erlandsson

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Susana Hernández García
Ana Carla García Valenceja



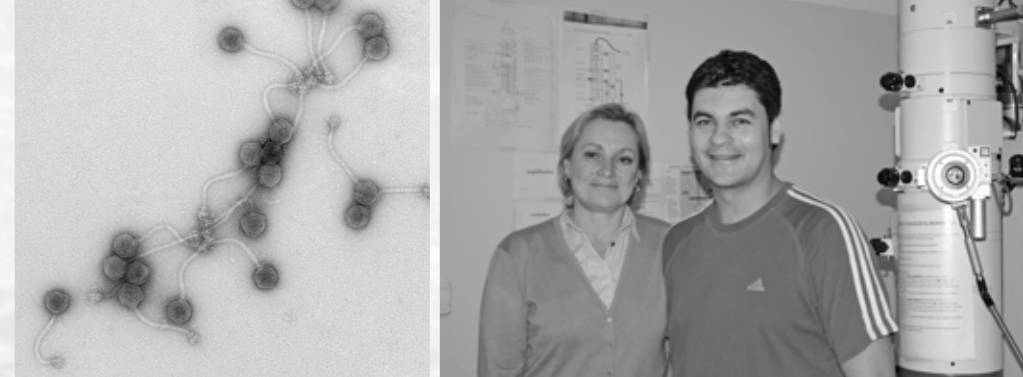
Electron Microscopy

LEAD INVESTIGATOR

Cristina Patiño Martín

PERSONNEL

Javier Bueno Chamorro



The Electron Microscopy service offers a variety of equipment and techniques for the preparation, processing and analysis of biological samples by transmission electron microscopy.

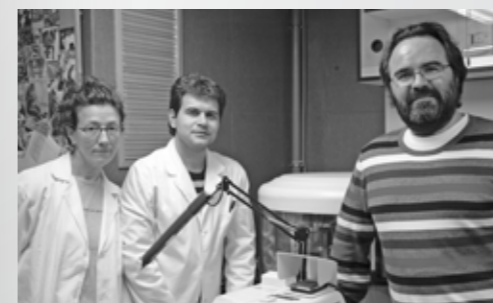
Techniques offered include chemical fixation and inclusion in epoxy and acrylic resins, cryofixation (plunge-freezing, high pressure freezing), cryosubstitution and inclusion in low-temperature resins, ultramicrotomy, immunogold staining, negative staining, negative immunostaining, in situ hybridization, conventional transmission electron and low electron dose microscopy.

The staff provides support to users both in the application of techniques and for equipment use. We offer regular training in the techniques and methods available. We are also responsible, in cases

where required, for sample preparation and image acquisition, and provide support for data interpretation.

The service has the following specialised equipment:

- Jeol JEM-1011 transmission electron microscope with ES1000W
- Gatan camera
- Leica EM MED 020 carbon coating system
- Leica Ultracut UC6 cryo-ultramicrotome with Leica FC6 cryo-chamber
- Reichert Ultracut E ultramicrotome
- Leica EM AFS2 automatic cryosubstitution system
- Leica EM PACT 2 instrument for high-pressure vitrification
- Leica EM TRIM sample trimmer (pyramitome)
- Reichert Knifemaker



CNB Histology Facility

LEAD INVESTIGATOR

Lluís Montoliu

PERSONNEL

Soledad Montalbán Iglesias
Óscar Sánchez Sánchez

At the CNB Histology Facility, we offer methods for the histological analysis of animal and plant biological samples. Available methods include the preparation of paraffin/wax blocks and plastic (HistoResin) for obtaining histological sections with an automated microtome, as well as preparation of blocks to obtain frozen tissue sections with a cryostat. Sections can be counterstained or maintained for later immunohistochemistry analysis. The facility is equipped with a cryostat, two automated microtomes, a tissue processor carousel, paraffin/wax embedding equipment, two water baths, a stereoscope, an oven, and additional small equipment to process all types of tissue samples.

Our expertise is reflected by the wide variety of tissue samples and species we have processed over the past years, including tissue samples from spleen, aorta, femoral, embryo and foetus, brain, cochlea, colon, stomach, ganglia, liver, thin gut, fingers and toes, muscle, eyes, ears, ovary, pancreas, skin, lung, prostate,

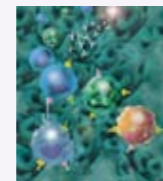
rachis, kidney, brown and white adipose tissue, mammary gland, testis, femur, tibia, gonads, fibula, trachea, thyroid gland, skin and mammary gland tumours, uterus and other tissues from animals including mice, rats, rabbits, sheep, lynx, cat, pig, fish, chicken, gazelle and humans. In addition, we have processed fruits, leaves, apical meristem, roots, stem from tomato, Arabidopsis and potato plants. A full list of tissues processed by the facility is available at: <http://www.cnb.csic.es/~histocnb/tabla.html>.

Since 2009, the CNB Histology Facility is associated with the IIB-UAM/CSIC Histology Facility (www.iib.uam.es/servicios/patexperimen/intro.es.html). The two centres merged their operations under the coordination of the CNB Histology Facility, enabling them to offer CNB and IIB researchers greater processing capacity of histological samples. The CNB Histology Facility has been training personnel from the IIB-UAM/CSIC Histology Facility and supervising work, aiming to establish equivalent output standards.



Flow Cytometry Facility

Flow Cytometry (CMF) is a multiparametric cell analysis technique whose purpose is to detect and identify molecules and cell structures using fluorescent markers and conjugated antibodies. Flow sorting is an extension of this technology, by which any cell or object measured can be separated selectively from the suspension based on properties measured in flow. The facility provides scientific and technological support to the different CNB research groups that require it, for which have the technical and human means suitable to guarantee maximum quality and continuous improvement of all our services.



The facility offers:

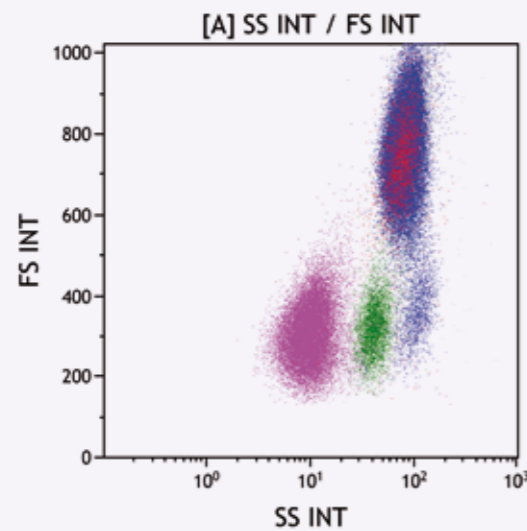
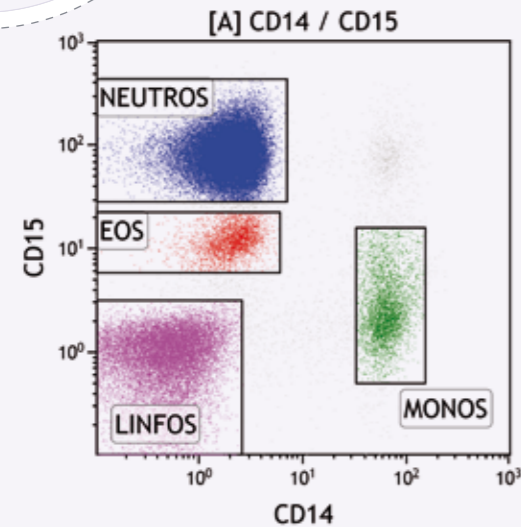
- Training and advice on the principles and applications of analytical flow cytometry, to obtain maximum advantage

- Development and optimization new applications incorporating new technologies and new reagents
- Quantification of secreted cytokines by multiplexed assays
- Result analysis using specialised software packages
- Cell isolation by cell sorting (sorting of cell populations including cell suspensions derived from any animal organ as well as from cell lines)

Equipment:

- BD FACSCalibur analyzer: 4 colours, 2 laser excitation (488 and 633 nm)
- 2 Beckman Coulter EPICS XL-MCL analyzers: 4 colours, 1 laser excitation (488 nm)
- Beckman Coulter Cytomics FC500 analyzer: 5 colours, 2 laser excitation (488, 633 nm)
- BD LSRII analyzer: 8 colors, 3 laser excitation (488, 633 and 405 nm)
- Beckman Coulter Gallios analyzer: 10 colours, 3 laser excitation (488, 633, 405 nm)
- Luminex 100 IS multiparametric analyzer: a system that can be used to quantify multiple cytokines (up to 100) or any other soluble molecule from a single sample
- Cell Sorter Beckman Coulter EPICS-ALTRA Hypersort

The unit also provides the computer science system to analyze the results obtained: 1 Mac and 2 PC platforms running specialised software packages (Cell Quest (Mac), WindMDI (PC), CXP (PC), MultiTime (PC), MultiCycle (PC), DIVA (PC), FlowJo (PC), Summit (PC), Kaluza (PC), etc.

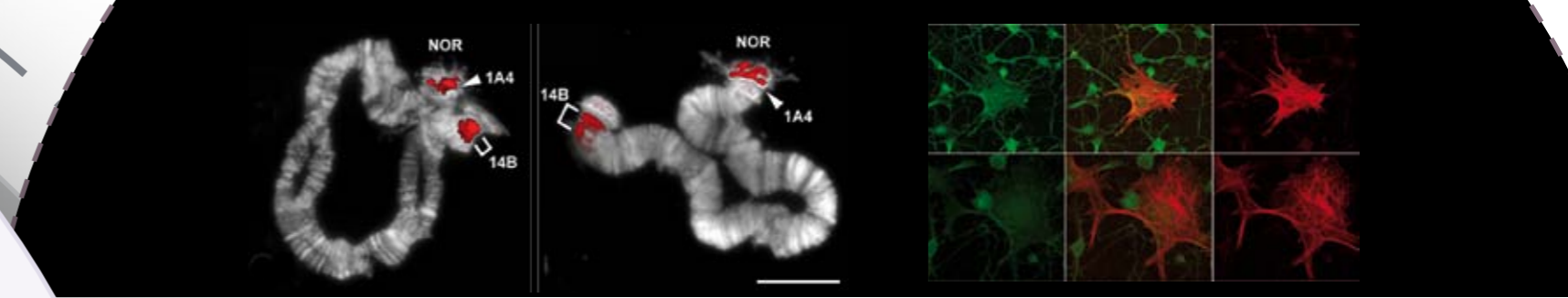


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Sara Escudero García
Pablo García Bravo
Sonia Rodríguez Murcia
Almudena González García



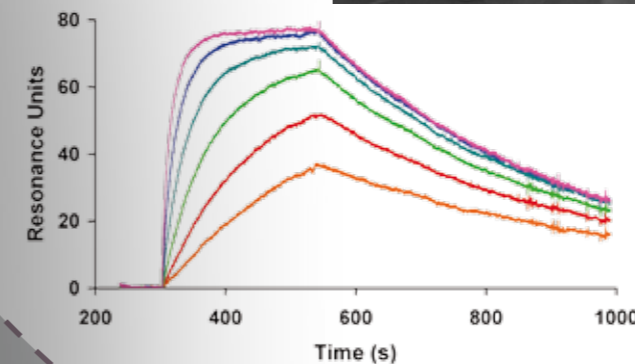
Protein Tools

LEAD INVESTIGATOR

Leonor Kremer

PERSONNEL

María Teresa Martín
Mónica García-Gallo
Mercedes Llorente
Laura Martín
Carolina Sánchez
Lucio Gómez



Time (s)

In summary, the unit produces and characterizes protein tools designed to interact with other molecules, develops assays and analyzes the qualitative and quantitative parameters of biomolecular interactions. We also provide users with antibodies, assays, methodologies and advice.

The Protein Tools Unit (PTU) is a facility focused on the design, creation and use of proteins as specific molecular tools. Activities include the generation and characterization of monoclonal antibodies (mAb) for research, diagnostic and therapeutic use, immune response studies, protein labeling, development of specific immunoassays and analysis of molecular interactions.

PTU services are provided to CNB scientists and to external researchers in public or private organizations. The staff offers technical expertise in immunobiology and immunochemistry, including theoretical and practical training courses.

More than 130 mAb to a wide range of antigens have been developed successfully. In the last two years, for example, mAb have been produced to nuclear proteins (Dido), enzymes (β -gal), kinases (p38, PKD, GSK3, ANNK1), membrane proteins (PLL-1), receptors (kidins220), viral antigens (SARS, TEGV), and immunoglobulins (IgE).

Biomolecular interactions involving proteins (chemokines, TCR, antibodies), peptides, oligonucleotides, liposomes and small organic molecules are analyzed using a surface plasmon resonance biosensor Biacore 3000.

The macromolecular X-ray crystallography facility provides the following services and techniques:

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

Service equipment:

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



Macromolecular X-Ray Crystallography

LEAD INVESTIGATOR

César Santiago





scientific & technical services

In vitro Plant Culture

The plants ability for the vegetative multiplication (totipotentiality) can be considered as a fundamental process.

When a culture originated from an explant is established can happen different regeneration and morphogenetical process that produce a new plant

The *in vitro* culture techniques are fundamental for propagation and genetic and biotechnologic plant improvement.

The work sterilization conditions, as well as the climatic medium physical factors: humidity, light (intensity and photoperiod), and temperature are essential in the *in vitro* culture techniques.

Specific plant growth chambers are necessary to preserve and control those factors. These chambers are a fundamental infrastructure for different scientific and technologic objectives like:

- **Explant culture:** adventice organs formation, clonation,...
- **Protoplast culture:** transformation studies, genetic variants production,...
- **Seed culture:** F2 individual segregation studies, plant growth studies using nutrients lacking mediums,...
- **Cell culture:** Maintenance of different plant species cell lines.

Services offered

The CNB *in vitro* Plant Culture Service maintains different equipments and offer the necessary techniques for:

- The sow and growth of plant cells, tissues and seeds.
- Their maintenance and propagation.

And so for the obtaining of genetically transformed plant cells by means of

- Permanent plant transformation: using the *Agrobacterium tumefaciens* microorganism (in tomato, tobacco, *arabidopsis*).
- Transitory transformation: using the "Particle Delivery System".

Instrumentation

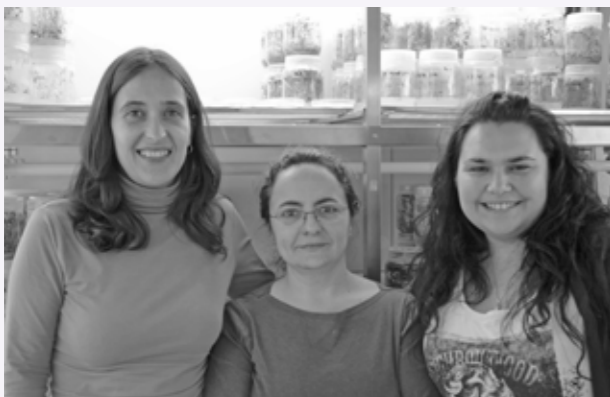
- Laminar flow hoods
- Plant Growth Chambers
- Centrifugal
- Particle Delivery System
- Microscope
- Incubator
- Ovens
- Sterilizer

HEAD OF SERVICE

Raquel Piqueras Martín

PERSONNEL

María Luisa Peinado Vallejo
Beatriz Casal López



Greenhouse Service

HEAD OF SERVICE

Tomás Heras Gamo
Carlos Alonso Blanco

PERSONNEL

Alejandro Barrasa Fustes
Esperanza Parrilla Carrillo
Raúl Pedraza León



The Greenhouse Service takes care of the following facilities specific for plant cultivation:

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

The Greenhouse Service carries out the following tasks:

- 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

Animal Facility

HEAD OF SERVICE

Ángel Fernando Naranjo Pino

SENIOR TECHNICIANS

Alberto García
Antonio Morale
Mercedes de la Cueva

Javier Martín
Silvia Alves

PERSONNEL

Ángel Moreno Calle
Sergio Magallón
Raquel Gutiérrez

Isabel Martín Dorado Caballero
Evaristo Criado
Lucio Gómez



The CNB Animal Facility dedicates its efforts to the generation and maintenance of animals for research. We support scientific personnel in developing new research techniques for their *in vivo* studies. Although our main work is with knockout, knock-in and transgenic mice, we also maintain rats, guinea pigs and zebrafish.

The facility is divided into four sections, based on the microbiological status of each animal colony. Last year, we incorporated new equipment and ventilation racks to increase the microbiological safety of our animals. We have an independent TII section for biological security and a unit for zebrafish husbandry and breeding.

Our personnel participate in the training of researchers in a national course on management and genetics of mouse colonies.



Radiation Protection & Biological Safety Service

The service provides scientific services, training, and guidance on all facets of radiation protection and biological safety at the CNB.

Functions and services:

- Risk assessment
- Acquisition of security and personal protective equipment
- Design of laboratories and installations
- Acquisition and management of radioisotopes
- Edition of internal health and safety manuals
- Processing of regulatory compliance documentation for implementation actions and normal operating conditions
- Training of and information to personnel who work with hazardous material
- Classification and labelling of laboratories
- Control of compliance with health and safety standards, operation and use of installations
- Control of personnel, management of medical surveillance and personal dosimetry, medical and dosimetric record-keeping
- Intervention in accidents and emergencies
- Control of production and packaging of hazardous waste
- Internal transport and storage of hazardous waste before transfer to authorised or controlled disposal facilities

Installations:

The service monitors risk operations in CNB laboratories and directly manages the biosafety level 3 laboratory, the gamma irradiator and the central radioisotope laboratory, which has:

- Two radioisotope cabinets
- Biosafety cabinet
- CO2 incubator
- Ultracentrifuge, centrifuge and microfuge
- SpeedVac
- Hybridisation oven



HEAD OF SERVICE

Fernando José Usera Mena

PERSONNEL

Sonia Calvo Ladrero
Jessica Gaspar Navarro
Aranzazu de la Encina Valencia



Washing & sterilization



HEAD OF SERVICE

Rosa María Bravo

PERSONNEL

Carlos Enríquez
María Trinidad Mba
Ana Isabel Nieto
Josefa Pérez Alfaro
Rosi Ramos
Arancha Rodríguez
Anunciación Romero González
María Ángeles Sánchez



Biosafety Level 3 Laboratory

HEAD OF SERVICE

Fernando José Usera Mena

PERSONNEL

Sonia Calvo Ladrero
Jessica Gaspar Navarro
Aranzazu de la Encina Valencia

The service manages the level 3 biological containment laboratory, consisting of three sublaboratories for in Vitro culture with all necessary equipment for safe handling of biological agents in Risk Group 3 and for type 3 confined activities with genetically modified organisms.

We have following equipment:

- Three biological safety cabinets (BSC)
- Two incubators for animal cell culture
- One incubator for bacterial culture
- One double-door autoclave
- SAS for biological inactivation (small materials)
- SAS for biological inactivation (large materials)
- Refrigerated ultracentrifuge
- Three refrigerated benchtop centrifuges
- Three refrigerated microcentrifuges
- Three inverted optical microscopes
- Liquid nitrogen tank
- Three ultra-low temperature freezers (-80°C)
- Communication systems: computer network and telephone
- Various alarm systems in case of malfunction, incident or accident

DIO Cell Culture

HEAD OF SERVICE

Remedios Proenza

PERSONNEL

Ana Montero
Gema Alcón



scientific & technical services



Economic Services

HEAD OF SERVICE

Mariano Muñoz Jiménez

PERSONNEL

María José Gregorio Usanos
Carmen Berreiros Cano
M^a Ángeles Lumbreras Carrasco
Elena Barreda García
Irene Vera Jiménez

María Virginia Hortal Robles
Esther Ruiz de la Hermosa Romero
Rafael López Laso
Diana Pastor Calero
Laura Rojas Sanz



Project Management

HEAD OF SERVICE

Soraya Olmedilla María

PERSONNEL

Aurora Cabrerizo Alonso
Pilar Ara Laúna
Daniel Martín Hernando
Pablo Antonio Coret Francés

DIO Management

HEAD OF SERVICE

Antonio Rodríguez Terán

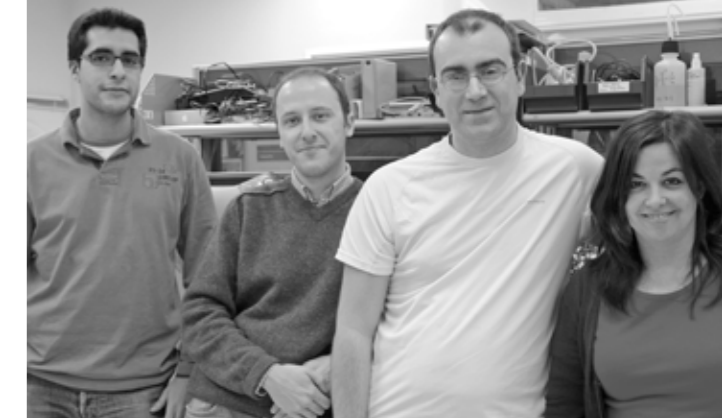
PERSONNEL

Coral Bastos
Catherine Mark

Information Technologies

Among other functions, the service provides:

- Microinformatic support
- Registry of equipment on the network
- E-mail accounts
- Management of distribution lists
- Management of network infrastructure (cable and wireless)
- Shared archive servers
- Information systems security
- Remote access
- Web server (not contents)
- Registry of DNS equipment
- Internet protocol telephony (shared with General Services)
- Server backups



HEAD OF SERVICE

Sonia de Diego

PERSONNEL

Óscar Bodas
Iñigo Oficialdegui
Alberto Sánchez
Patrick Moutel
Jorge Calvo
Antonio Millán

Human Resources

HEAD OF SERVICE

Marina Hernando Bellido

PERSONNEL

María Jesús Raboso Pérez
Susana Pena González
Pablo Antonio Coret Frances
Javier Tortosa Nieto
M^a Jesús Torrado Macías

Procedures:

- Monitoring and control of all grant calls, production of reports, annual reports, final reports etc.
- Formal contractual complaints and preparation of compensations
- Handling of resignations and departures
- Registration, termination and variations in Social Security of contracted staff, civil servants and fellowship holders at the CNB, Institute of Theoretical Physics and the Enological Institute (ICV)
- Registration, termination and variations in accident and medical insurance
- Management, control and processing of all types of leave, holidays, and authorised absences for all staff at the centre
- Management, control and processing applications for service recognition of civil service and contracted personnel
- Management, control and processing of overtime for permanent workforce staff
- Provision of civil service positions through competitive examinations and merit selections
- Management, modification, and control of job descriptions for civil service and workforce staff



- Management and processing of foreign employee contracts
- Management of expenditure for staff and research projects, with maintenance and updating of the database created for this purpose
- Management, processing and control of the internal promotion process for civil servants and workforce staff
- Management of calls for temporary positions
- Management of applications for retirement, extension of service, recognition of seniority, recognition of personal level
- Management and processing of stays abroad of scientific staff (sabbaticals)
- Management, processing and control of different types of productivity allocations
- Certification of documents for selection processes and for project justification
- Preparation of identification cards for access to the various facilities in the centre
- Daily maintenance of the centre's database and the CSIC institutional database for personnel and organizational management
- Preparation of legal and compliance reports
- Support and advice to all staff of the centre, as well as at the Theoretical Physics Institute and Enological Institute, as well as information on all new regulations and personnel management



Research Support

General Services

HEAD OF SERVICE

Gabriel Sánchez de Lamadrid

PERSONNEL

Julián Miguel Grande
Antonio Rojo
Manuel Grande
Ángel Godoy
Vicente Martín
Gema Alcón

Pilar Cutillas
M^a Socorro Muñoz
Lourdes Sánchez
Celia García
M^a Ángeles González
M^a Sol Aguirre
Ana María Puerto
Juan Pablo Illescas
M^a del Carmen García
Eloína Rodríguez
Rosa María Martínez

J. Miguel de la Hoz
Juan José Fontela
Paloma González
Ignacio Santidrian
Carolina Nogales
Calixta Manzueta
Sarah Lenoan
Aillin Notario
M^a Concepción Gómez
Angélica Chicaiza

CNB Library

HEAD OF SERVICE

M^a Dolores Aparicio Trujillo

The CNB Library carries out the following activities:

- Acquisition, technical processing, cataloguing and classification of monographs

(207 monographs acquired and catalogued in 2009 and 2010)

- In-house lending to personnel and laboratories

Loans in 2009: 154

Loans in 2010: 86

- Interlibrary loan services

Requests attended in 2009: 359

Requests attended in 2010: 402

- Access to online databases, e-journals and e-books



Security

HEAD OF SERVICE

Sócrates Gutiérrez Monreal

PERSONNEL

Jesús Payán Aparicio
José Fernando Albarran Aparicio
Juan José Bech Afonso
Tomás Castro
Yolanda Cantosro

Purchasing & Supplies

HEAD OF SERVICE

Ramón Serrano Coronado

PERSONNEL

M^a Soledad Notario Torres
Montserrat Nerín Toboso
M^a José Caballero Martín
Julio Díez Álvarez
Héctor Hernández Redondo
Antonio Pastor Encabo
Juan Carlos Bermudo Zamora



Photography

HEAD OF SERVICE

Inés Poveda



Outreach Management

HEAD OF SERVICE

Alfonso Mora

The CNB hosts an outreach office which helps our scientists in the dissemination of their results to other scientists and the society.

