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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, 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. In addition, the CNB hosts two centres of the European Strategic Forum for Research Infrastructures (ESFRI) Project: the Spanish node of INFRAFRONTIER, which includes the European Mouse Mutant Archive (EMMA) and the Instruct Image Processing Centre (I2PC), the Instruct-ERIC facility in the area of Structural Biology. Specialised personnel offer technical support in many other facets of the centre's scientific activities.

STRUCTURAL AND CELL BIOLOGY

Advanced light microscopy

Sylvia Gutiérrez

Quantitative Image analysis

Carlos Óscar S. Sorzano

Cryoelectron microscopy

Rocío Arranz

Electron microscopy image processing

José María Carazo

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Cristina Patiño

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César Santiago

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M^a Carmen Moreno-Ortiz

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Leonor Kremer

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Belén Pintado

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Lluís Montoliu

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José Manuel Franco

Proteomics

Fernando Corrales

Bioinformatics for genomics and proteomics

Juan Carlos Oliveros

Sequence analysis and structure prediction

Mónica Chagoyen

Scientific computing

José Ramón Valverde

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RESEARCH INSTALLATIONS

Radioactive facility and biosafety level 3 laboratory

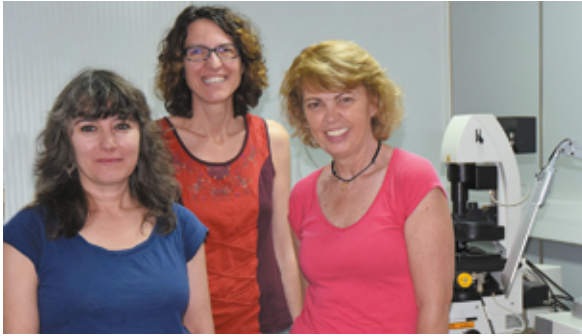
Fernando Usera

Animal facility

Ángel Naranjo

Greenhouse

Tomás Heras



Advanced light microscopy

HEAD

Sylvia Gutiérrez Erlandsson

PERSONNEL

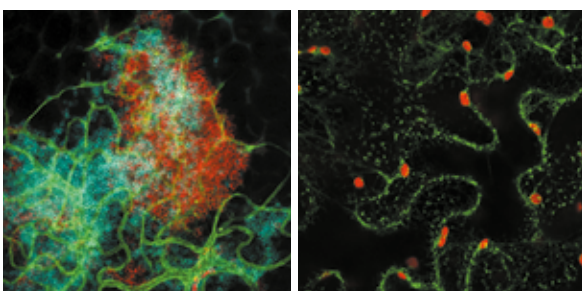
Olga Giménez Sáez
Ana María Oña Blanco

The presence of fluorescent markers in biological samples allows the development of different experimental studies involving single or multiple fluorescent labelling in tissues and living or fixed cells.

The Facility provides state-of-the-art infrastructure for epifluorescence, confocal laser scanning microscopy, TIRFM and STED nanoscopy. The available applications include cell-tracking, multi-position acquisitions, tiling and stitching reconstructions and use of image processing tools, covering main light microscopy experimental imaging approaches.

The equipment and services are available to all CNB personnel and researchers from the public and private sectors.

The technical staff offers assistance and training about equipment use, available methods and image processing and analysis procedures. We also provide cell culture support and aliquots of probes and secondary antibodies with broad use in fluorescence microscopy applications.



Quantitative image analysis unit

HEAD

Carlos Óscar S. Sorzano

PERSONNEL

Ana Cayuela López (PhD student)

The quantitative image analysis unit complements the advanced light optical microscopes at the cnb by adding the possibility to extract objective information from the acquired images and movies. Quantitative analysis allows objective comparison of the results under different conditions. We develop advanced image processing algorithms that automate the extraction of quantitative features, and facilitates statistical analysis and characterisation.

Examples of the tasks we have tackled are:

- Automatic image segmentation
- Morphological characterisation and classification of objects
- Tracking of objects in videos
- Trajectory classification
- Optical characterisation of the microscope
- Correction by software of some of the microscope aberrations
- Image restoration





Cryoelectron microscopy

HEAD

Rocío Arranz

PERSONNEL

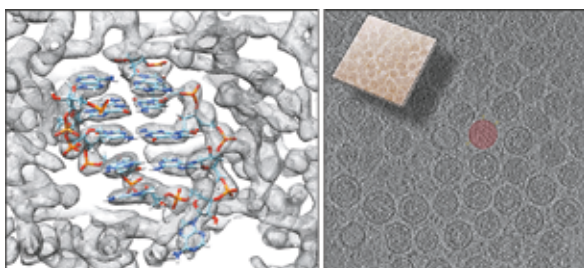
Teresa Bueno
Francisco Javier Chichón
Rafael Nuñez (CIB-CSIC)
Noelia Zamarreño

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

The facility provides access to three microscopes for cryoelectron microscopy of biological material: A 300 kV JEOL CryoARM equipped with an autoloader, a Gatan K3 direct electron detector and Omega energy filter and a 200kV FEI Talos Arctica, equipped with autoloader Falcon III direct electron detector. Both can be used for high resolution studies using single-particle methodology. Additionally, the facility hosts a standard 120 KV JEOL JEM 1400 for sample screening.

The service also has four different apparatus for specimen vitrification: a FEI Vitrobot, a Leica EM CPC, a Leica EM GP2 and a high pressure freezer Leica EM ICE.

The facility also offers the cryocorrelative microscopy technique, which allows the analysis by cryo-optical microscopy using a Zeiss LS900 AiryScan microscope and cryoelectron microscopy. The use of a Zeiss CrossBeam 550 cryo-FIB-SEM microscope will increase the cryocorrelative microscopy capabilities of the facility to direct visualisation of cells for tissue-cell resolution or for preparation of thin lamellas in cells for molecular resolution.



Instruct image processing center – I2PC

HEAD

José María Carazo

TECHNICAL DIRECTOR

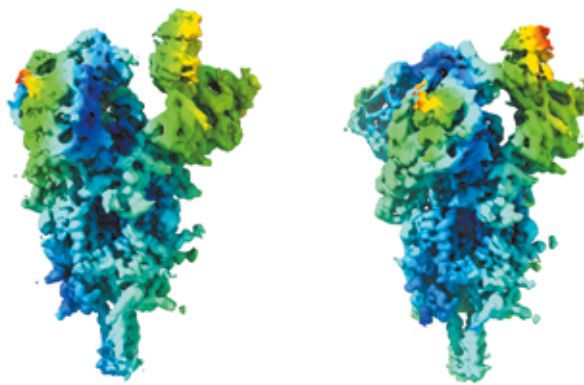
Carlos Óscar Sorzano

PERSONNEL

Blanca E. Benítez
Roberto Melero
Marcos Gragera

Instruct-ERIC is the European Research Infrastructure (RI) in the field of Structural Biology. As part of the Spanish contribution to Instruct-ERIC, the CNB hosts the Instruct Image Processing Center (I2PC), specialised in providing access to researchers from Instruct-ERIC member states with challenging CryoEM image processing projects. Short proposals are directly sent to Instruct Hub, where a review process is coordinated. Selected projects are then conducted at I2PC. Access is at no charge at the point of use for awarded projects, and I2PC personnel is usually acknowledged at publications only, except if particular collaborative developments are needed for the project. We highlight the joint work with GSK on vaccine research and the one in collaboration with a consortium of international laboratories (including Nobel Laureate J. Frank) on the analysis of Ribosome Associated Proteins. COVID-19 has been a special topic this year, and a work on SARS CoV2 spike flexibility was published in IUCrJ.

I2PC also provides support and training in the use of image processing software, at the same time that it develops software and standards oriented towards the standardisation, simplification and reliability of the image processing tasks. During 2019 - 2020 we have hosted 4 courses (2 virtually), which have been attended by more than 86 researchers.





Electron microscopy

HEAD

Cristina Patiño Martín

PERSONNEL

Beatriz Martín Jouve

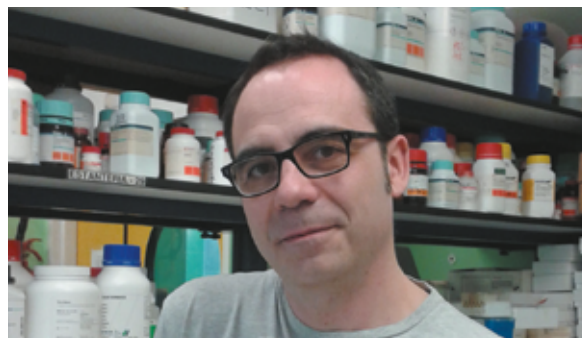
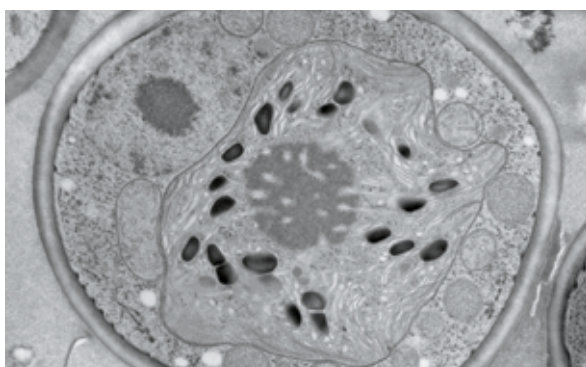
The CNB electron microscopy facility provides scientific and technical support to CNB groups and researchers from public or private institutions.

Technical staff offers assistance and training in the use of equipment and advise on the most appropriate techniques to analyse biological samples (from macromolecular complexes to virus and bacteria, cell cultures and vegetal or animal tissues) using transmission electron microscopy.

We also offer specialised sample preparation, microscopy analysis, data collection and support for data interpretation.

For sample processing the facility disposes of a ultramicrotome, a cryo-ultramicrotome, an automatic freeze-substitution system, two carbon coating equipments and a high-pressure vitrification unit. The facility is equipped with a light microscope and a 100 kV transmission electron microscope with digital cameras.

During 2019-2020 the facility has been used by more than 60 research groups.



Macromolecular x-ray crystallography

HEAD

César Santiago

Protein x-ray crystallography is a high-resolution technique that allows us to study protein structure at atomic level. This method provides a detailed view of protein function, ligand and protein interactions, supra molecular organisation and mutants related to human diseases. Great improvements both in crystallisation techniques, and software for structure resolution and refinement have been achieved since the last decade, increasing the chances of solving a macromolecule structure.

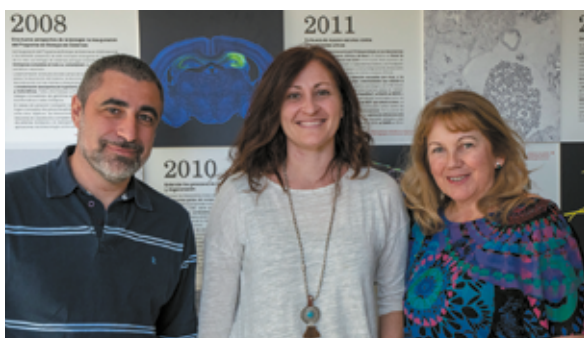
The macromolecular X-ray crystallography facility at the CNB provides the following techniques:

- Advice and supervision on protein production from cloning to expression in bacterial, yeast and eukaryotic systems.
- Support and training on protein purification to obtain crystal-grade protein for crystallisation.
- Automated macromolecular crystallisation.
- Crystallization conditions optimisation 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:

- Mosquito Xtal3 crystallisation robot.
- Genesis RSP 150 workstation (Tecan Trading AG) nanodispenser robot.
- Two temperature controlled crystallisation rooms.





Flow cytometry

HEAD

M^a del Carmen Moreno-Ortiz Navarro

TECHNICIANS

Sara Isabel Escudero García
Miguel A. Sánchez Luengo

Flow cytometry is a powerful tool to analyse multiple parameters on an individual cell. With this technique, we can identify, quantify and isolate different subpopulation of cells based on the levels of expression of fluorescent markers and their relation to each other. It uses a combination of antibodies with fluorophores or fluorescent molecules, both on the surface and intracellularly.

The Unit provides scientific and technological support to the different CNB research groups, as well as to researchers from public and private sectors. We offer the ability to use the different existing applications in flow cytometry and collaborates with the design of experiments, reagents, problem solving, as well as analysis and interpretation of data.

In the Unit there are the following instruments:

Equipment:

Analysers: BD FACSCalibur: 4 colours. Two Beckman Coulter CYTOMICS FC 500: 5 colours. BD LSRII: 8 colours. Beckman Coulter GALLIOS: 10 colours. Beckman Coulter Cytotflex: 13 colours. Luminex 100 IS Multiparametric Analyser.

Sorter: Cell Sorter Beckman Coulter Moflow XDP: 10 colours.

Analysis Platforms: The Unit also provides 3 PC platforms to analyse data with specific software: WindMDI, CXP, MultiTime, MultiCycle, DIVA, Flowjo, Summit and Kaluza.

We have developed and offer to the users different applications of their interest, such as the analysis of cell viability (in either fresh or fixed cells), apoptosis, cell cycle and ploidy levels in eukaryotic cells, mitotic population studies, proliferation assessment using BrDU, EdU, CFSE or CELLTRACE, gene expression of fluorescent proteins, immunophenotyping up to 13 colours, intracellular signalling, cell's migration, Ca²⁺ mobilisation, intracellular cytokines, quantitation of soluble molecules by multiplexed assays and cell sorting.



Protein tools unit

HEAD

Leonor Kremer

PERSONNEL

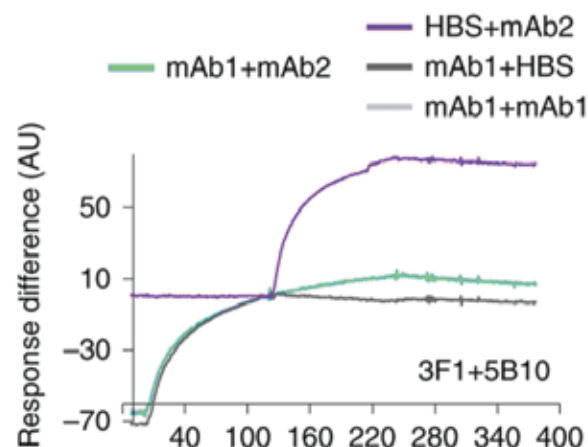
Ana M. García Cabrero
Mercedes Llorente
María Teresa Martín
Elena Ramos

The Protein Tools Unit focuses on immune response studies, generation and characterisation of monoclonal antibodies, design and development of immunoassays, and molecular interaction analyses. The Unit is a founder member of the EuroMAbNet, the European organisation of academic laboratories specialised in mAb production.

Antibodies, assays, research tools and services are provided to scientists from the CNB, other CSIC institutes, universities, public research organisations and private companies. The laboratory offers expertise, technical assistance, advice with data analysis and interpretation, user training and introduction of new methods. The core facility also organises theoretical and practical courses.

In this period, new monoclonal antibodies were raised and characterised against viral proteins (Porcine circovirus type 2, Ebola virus, SARS-CoV-2, etc.) and tumour antigens present on human leukemia cells.

The facility is equipped with an EnVision multilabel reader and a biosensor (Biacore 3000), which allows studies of molecular interactions. The biosensor is used for kinetic constants and affinity analyses of different types of molecules.





Transgenesis

HEAD

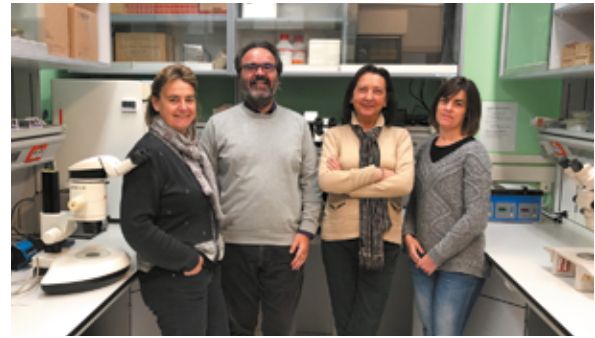
M^a Belén Pintado

PERSONNEL

Verónica Domínguez (CBMSO-UAM)
M^a José Palacios

The Transgenesis Service is a joint core service shared between the CNB and CBMSO that facilitates access to genetically modified (GM) mouse models to the research groups of both centers, other CSIC institutes, and also external customers, academy or private. Among other services, we incorporate genetically altered mouse lines to the barrier animal facility through embryo transfer or *in vitro* fertilisation. Our service also provides support in the design and generation of new mouse models, including traditional transgenesis, gene targeting and genome editing. Our aim is to complement the different research groups with technological and scientific support and resources in all the steps involved in the use of GM mice, from genetic modification design to the correct mouse colony management. In addition to fare-based services, we can also establish scientific collaborations when they help us incorporating new state-of-the-art technologies to our services.

For CSIC research groups, we offer the design of guides and edition strategies to generate Knock-out (KO) Knock in (KI) or conditional models using CRISPR/Cas9 technology, either through electroporation or microinjection. For all customers, we generate GM mice through pronuclear microinjection or ES cell-based technologies with ES cell lines from international consortia or generated indoors. We provide embryos in different stages, develop ES lines and perform cell microinjection. We offer training in different assisted reproductive techniques and reproductive phenotyping in mice. Regarding the COVID 19 pandemic, we have generated 8 transgenic lines and 2 KI models susceptible to infection with SARS-Cov-2.



Mouse embryo cryopreservation

HEAD

Lluís Montoliu

TECHNICAL MANAGER

Julia Fernández

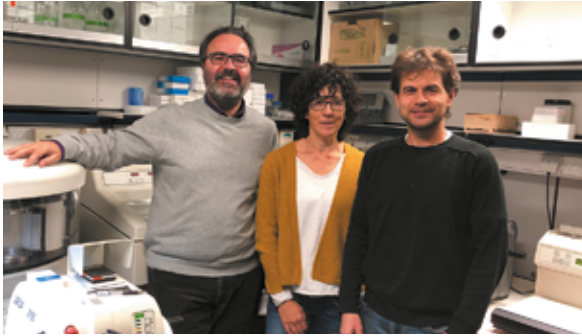
PERSONNEL

Marta Castrillo
María Jesús del Hierro

The CNB mouse embryo cryopreservation facility offers to researchers the possibility to freeze, maintain and rescue transgenic and knockout mouse lines in the form of embryos and/or sperm, hence contributing to current animal welfare recommendations and complying with the associated legislation on animal experimentation. Current methods available include freezing sperm, oocytes and/or embryos, the thawing of sperm, oocytes and/or embryos previously frozen and the subsequent revitalisation of the cryopreserved mouse lines through *in vitro* fertilisation, assessment and/or logistical support for importing/exporting frozen or refrigerated embryos or sperm, from and to the CNB, and quality controls and genotyping procedures. The facility can also produce genome-edited mouse models using the latest CRISPR-Cas9 tools through embryo electroporation.

The CNB hosts the Spanish node of the European scientific research infrastructure (ESFRI) called INFRAFRONTIER, which includes the European Mouse Mutant Archive (EMMA), and whose objective is the generation, phenotyping, cryopreservation, organised archiving and coordinated distribution of mouse lines of interest in biomedicine. EMMA has more than 7,600 mouse mutant lines cryopreserved and is composed of 16 nodes that are present in 13 European countries. About 400 of those mouse lines are cryopreserved and offered from the Spanish node at CNB. The CNB mouse embryo cryopreservation facility has signed scientific cooperation agreements with the Spanish National Cancer Centre (CNIO) and with the Centre for Animal Resources and Development (CARD) at the University of Kumamoto (Japan) for the archiving and distribution of mutant mouse lines of interest in biomedical research.





Histology

HEAD

Lluís Montoliu

TECHNICAL MANAGER

Soledad Montalbán

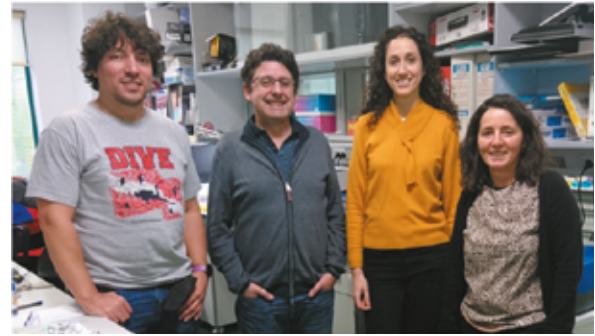
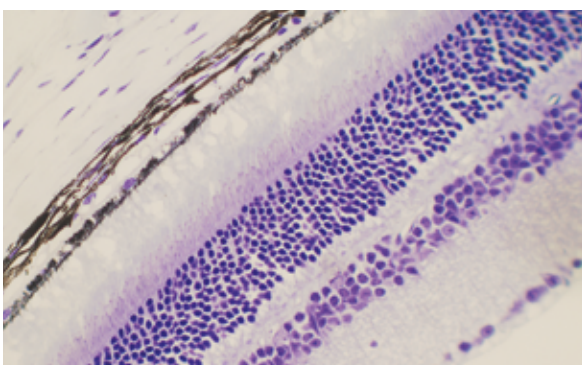
PERSONNEL

Óscar Sánchez

The CNB histology facility offers the preparation of animal and plant biological samples for their histological analyses. All requests are received and processed electronically, through the established facility's registration procedure at the devoted web site, available in Spanish and in English. Offered methods and procedures include the preparation of wax (paraffin) and plastic (resin) blocks with biological specimens embedded, and the corresponding generation of histological sections with one of the two available automated microtomes.

The Histology facility also offers the preparation and sectioning of frozen blocks with the cryostat. The orientation, width and arrangement of the sections can be specified by the user. All sections can be counterstained with any of the available staining procedures (haematoxylin/eosin, cresyl violet, PAS, Mason's trichrome, elastin fibres/Van Gieson/Sirius Red, etc.) or can be processed subsequently for immunohistochemistry.

The facility implements new staining procedures or histological methods upon request. The CNB histology facility has an ample experience in processing a large variety of animal and plant tissues and organs. The CNB histology facility coordinates a joint platform with the IIB-UAM/CSIC histology facility, offering to CNB and IIB researchers a larger processing capacity for histological samples.



Genomics

HEAD

José Manuel Franco Zorrilla

PERSONNEL

Luis Almonacid

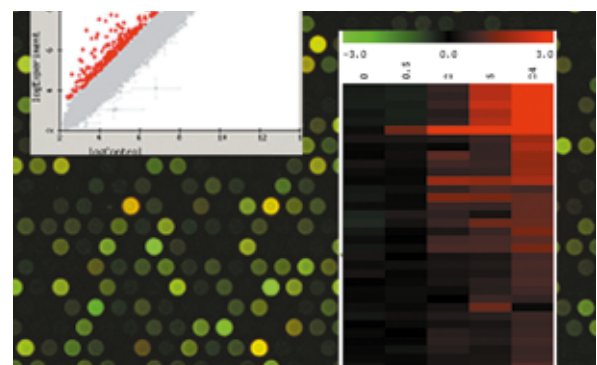
Marta Godoy

Irene López-Vidriero

The genomics facility is focused on the analysis of gene expression from biological samples using microarrays, interrogating the activity of complete genomes in a single experiment, and contributing to the elucidation of the genetic basis of the biological processes. The facility routinely hybridises and analyses one- and two-channels microarrays, including Agilent, Afymetrix, and custom microarrays.

The services offered by the facility include microarray printing and design, analysis of RNA integrity and microarray hybridisations. Raw data are statistically analysed using "state-of-the-art" algorithms, and filtered results are supplied to customers in a web-based easy-to-use tool developed by the facility.

The facility offers support in the use of several bioinformatics tools for functional analysis, helping customers in the biological interpretation of their results. The facility also offers the possibility of validating gene expression data by real time qPCR.





Proteomics

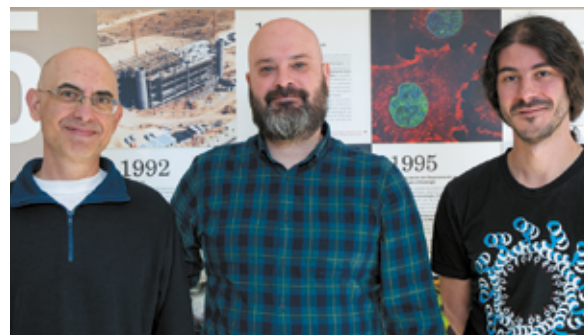
HEAD

Fernando J. Corrales

PERSONNEL

Alberto Paradela
Sergio Ciordia
Manuel Lombardía
Rosana Navajas
Miguel Marcilla
Lorena Carmona
Laura Guerrero
Fátima Santos
Patricia Gómez

The Functional Proteomics laboratory of the CNB provides resources to identify, characterise and quantify proteins, either purified or as complex mixtures from any biological system. During the 2019-2020 data Independent MS Analysis, processing of challenging samples with high SDS concentrations and S-TRAP columns and functional interpretation of data were implemented. We have performed 4138 proteomic analyses for 404 users including: unsupervised protein quantification by label free or isobaric labeling, targeted quantification, posttranslational modification analysis, analysis of HLA peptide repertoires and structural proteomics. The platform has been upgraded with a new lab and two new state-of-the art instruments Thermo Exploris 240, equipped with ion mobility modules and two nano HPLC Ultimate 3000, one of them with dual capacity to work in nano- and micro-flow modes. We are currently working in: first, structural proteomics: intact protein characterization and protein-protein interaction analysis (combining peptide crosslinking and mass spectrometry). Second, analysis of posttranslational modifications of proteins, including targeted and open-search analysis for epigenetic histone modification patterns.



Bioinformatics for genomics & proteomics (bioinfogp)

HEAD

Juan Carlos Oliveros

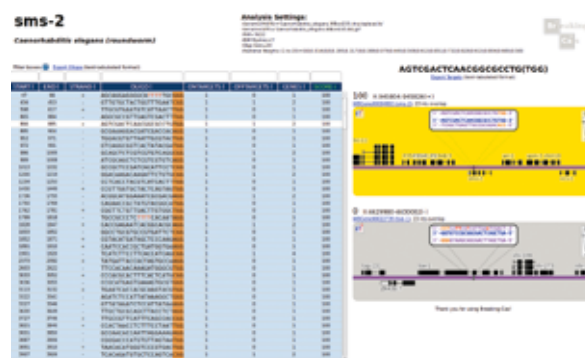
PERSONNEL

Juan Antonio García-Martín
Rafael Torres-Pérez

Our service provides CNB's research groups with bioinformatic support for the analysis, visualisation and interpretation of both genomics and proteomics-related projects. Among other services we provide:

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

In short, at the BioinfoGP service, we try to fill the gap between the complex outcome of the many powerful biostatistical methods available and the final researcher's needs.





Sequence analysis and structure prediction

HEAD
Mónica Chagoyen

Sequence analysis and protein structure prediction methods can explain, simplify and further guide experimental work.

We specialise in ad-hoc analysis of protein sequences to solve specific problems or questions.

In our analysis we commonly:

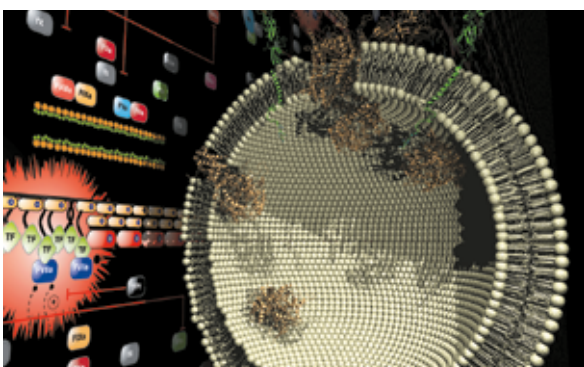
- Predict protein structure
- Search for homologous proteins
- Generate multiple sequence alignments
- Produce structural organization drafts
- Study relevant residues for protein structure/function
- Extract sequence features from full proteomes

Additional services include:

- DNA/RNA motif discovery
- Consultancy in the use of sequence-based methods
- Generation of high-quality protein sequence/structure images for publication

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

The service is offered to the CNB-CSIC as well as to other academic institutions and private organisations.



Scientific computing

HEAD
José R. Valverde

In the period 2019-2020 our work has concentrated mainly in collaboration analyses with various research groups in several disciplines, concentrating our efforts mainly during 2020 on work related to COVID19.

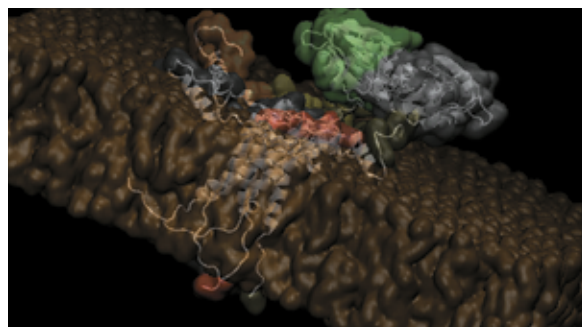
The main lines of work in this period spanned the following topics:

Dynamic metabolic modelling of heterologous protein secretion in *S. lividans*, and of antibiotic resistance in *S. maltophilia* and development of machine-learning based methods to analyse modelling results. We further developed our Adaptive DFBA modelling approach, and applied ML/AI to the analyse of metabolite evolution, prediction of flux evolution based on metabolite concentration, and clustering of internal metabolic fluxes.

Exome analysis of human prostate cancer data from two large cohorts with ~200 individuals each, developing automated protocols based on GATK to clean data, identify variants and annotate them. We have started work on predicting the protein structure of the involved oncogenic proteins with a look towards structure-based prediction of the potential effect of variants.

Structural, bioinformatic and immunogenetic analysis of HIV and CoV vaccines. As a part of this work we have started developing an in-house protocol for *ab initio* protein structure prediction to become independent of external servers.

Study of SARS-CoV2 proteins related to virus entry in the cell and development of COVID-19. We modeled and analysed mutants of viral proteins S and E and their interactions with human targets, and conducted drug screenings for potential treatments against COVID-19.





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 color printing of large format posters and, on request, also provides advice for graphic and image design.



Cell culture, washing and sterilisation

HEAD

Rosa M^a Bravo Igual

PERSONNEL

Carmen Berdeal Mera
Margarita Felipe Hombrados
Isabel Martín-Dorado
Ana Montero Moral
Ana Isabel Nieto Jiménez
Josefa Pérez Alfaro
Rosa Ramos Hernández
Aránzazu Rodríguez Martínez
Sonia Rodríguez Murcia
Anunciación Romero
Ángel Valera Lopez

EXTERNAL PERSONNEL (CLECE)

Fernando Oliver Tinuco
Alioune-Aboutalib Sow
Herminia de la Hoz Lorente

Services

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



Instrumentation

HEAD

Ismael Gómez López

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.



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



Radiation protection and biological safety

HEAD

Fernando Usera Mena

PERSONNEL

María Teresa Bartolomé Jiménez
 Aránzazu de la Encina Valencia (coordinator)
 Iris Esparza Collado
 Jessica Gaspar
 Marta Sanz Martínez

OCCUPATIONAL RISK PREVENTION UNIT

Nuria Martín Montes (external)

Service activities

- Evaluation of biological, chemical and radiological risks
- Design of laboratories and other facilities. Management of official authorisations and monitoring of compliance with regulations
- Issuing of guidelines and operating procedures. Risk prevention training
- Acquisition of radioisotopes and protection equipment
- Medical and dosimetric surveillance. Management of accidents and emergency
- Management of biological, toxic and radioactive waste

Research activity

Research on SARS-CoV-2 and other high-risk pathogens: new viricides, survival and routes of transmission

Occupational Risk Prevention Unit

Occupational health and safety in areas not related to experimental activities: health, safety and ergonomics. Coordinating business activities regarding safety and health. The Biological Safety Service, in collaboration with the Occupational Risk Prevention Unit, is in charge of the COVID-19 tracing system that operates at the CNB to follow-up COVID-19 positive cases.

This service obtained in 2020 the XI Award for Excellence in Occupational Risk Prevention 'Ramón Tobar' (CSIC) for its management system in risk prevention training.



Biosafety level 3 laboratory and radioactive facility

HEAD

Fernando Usera Mena

PERSONNEL

María Teresa Bartolomé Jiménez
 Aránzazu de la Encina Valencia (coordinator)
 Iris Esparza Collado
 Jessica Gaspar Navarro
 Marta Sanz Martínez

Biosafety level 3 laboratory

The laboratory has three sub-laboratories and the necessary equipment for safely handling high risk pathogens: changing room and exit shower, steam sterilizer, air lock, pass through box, effluent treatment plant, data transmission network and remote alarm systems.

Research equipment: biosafety class IIA cabinets, CO₂ cell culture incubators, microbiological incubator, fluorescence microscopes, ultracentrifuge, refrigerated centrifuges and microfuges, ultra-freezers, etc.

Radioactive facility

The CNB radioactive facility is equipped with all the required systems of shielding, containment and detection of ionising radiation.

Research equipment: cabinets for radioisotopes beta and gamma, Biosafety class IIA cabinets, CO₂ cell culture incubators, centrifuge and microfuge, inverted optical microscope, etc.





Animal facility

HEAD

Ángel Naranjo

RESEARCH TECHNICIAN

Javier Martín

SHIPMENT COORDINATOR AND ADMINISTRATION

Alberto García García

AREA AND COLONY MANAGERS

Andrés Miguel Acosta Moreno	Raquel Gutierrez Castro
Sara Flores Solano	Eladio Martínez Otero
Iván Jareño Flores	Antonio Morales Martín

ANIMAL TECHNICIANS

Carlos Elías Sánchez	Oscar Francisco Montes Carrasco
Raul García de la Fuente	María Isabel Rodríguez León
Sergio Jiménez Antón	Patricia Sanz Arenillas
Alfonso Manchado Gonzalez	Miguel Talero Rodríguez
Guillermo Meza Fernández	

The CNB laboratory animal facility is an area dedicated to the production and maintenance of experimental animals. Most of the experimentation is carried out with 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 depending on the microbiological status of the animals, providing special housing conditions for conventional, genetically modified, and immunodeficient animals, depending on the experimental objectives. At the same time, a totally isolated biosafety area is dedicated to in vivo experiments using biological agents.

The animal facility staff delivers services to laboratories for obtaining commercial lines and strains of mice, shipping animals, 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.

In addition, 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.

The facility also organises courses for continued education specially about management of colonies of genetically modified animals.

The facility's goal is to achieve research excellence following the 3R principles: reduction, refinement, and replacement of animal experiments.



Greenhouse

HEAD

Tomás Heras Gamo

PERSONNEL

Alejandro Barrasa Fuste
Joaquín Rivera Cuesta

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)
- 16 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

