# 10

## SCIENTIFIC CAREER DEVELOPMENT

Training of future generations of scientists and technologists is a major priority for the CNB. In the 2019-2020 period, 38 PhD students received competitive fellowships (e.g., INPhINIT, FPU, FPI) to realise their PhD thesis at our institute, and 63 students obtained their PhD degree under a CNB scientist's supervision. Our centre hosted 74 undergraduate and 83 master's students from Spanish and international universities, allowing them to received first-hand experience in biotechnology research. In addition, 42 short-term trainees and visiting scientists chose the CNB for its outstanding training opportunities. Moreover, CNB researchers actively participate in some of the best university and master's degree programmes in Spain.

We are making continuous efforts to attract young people who wish to pursue a scientific career. We have already celebrated the 7th edition of the "CNB course on introduction to research" for undergraduate students. In collaboration with the CSIC and funding from the Severo Ochoa Centres of Excellence Program, we offered fellowships to attract brilliant master's students.

Our PhD training program, launched in 2014 as part of the Severo Ochoa Centres of Excellence Program, is fully established. The PhD Student's and Training Advisory Committees, with the support of the Science Communication and Outreach Officer (Susana de Lucas), organise annual activity programmes to support career development. From courses fostering public presentation skills, how to write a scientific paper, or an interactive workshop on ethics and integrity in research, to welcome events for new PhD students and predoctoral scientific workshops, we aim to improve both their scientific and other soft skills useful in an academic career.

Around 25% of our personnel are postdoctoral researchers, a task force that drives the excellence of our research and participate in the training of younger students. Our centre attracted 12 talented young scientists through international, national and regional calls such as Marie Skłodowska-Curie Actions from the European Commission, Juan de la Cierva, Ramón y Cajal and Talent Attraction Programmes.

A rich program of seminars, conferences, workshops and courses, more than 150 in the 2019-2020 period, provide optimal opportunities for our researchers to keep up with the latest advances in biotechnology. Highlights from the past two years include an international a Congress in collaboration with the CBM-SO on "Chemokines and Cell Migration", involving 120 participants, and a scientific

congress in honor of the scientific career of Prof. J. L. Carrascosa to celebrate 25 years of Electronic Cryomicroscopy in Spain. The Congress attracted two Nobel laureates and had more than 150 participants.

Although the 2020 COVID-19 pandemic has forced changes in the celebration of scientific seminars, now converted in webinars, we have taken this as a new opportunity to reach wider audiences through the use of online platforms.

**SCIENTIFIC ACTIVITIES COMMITTEE**

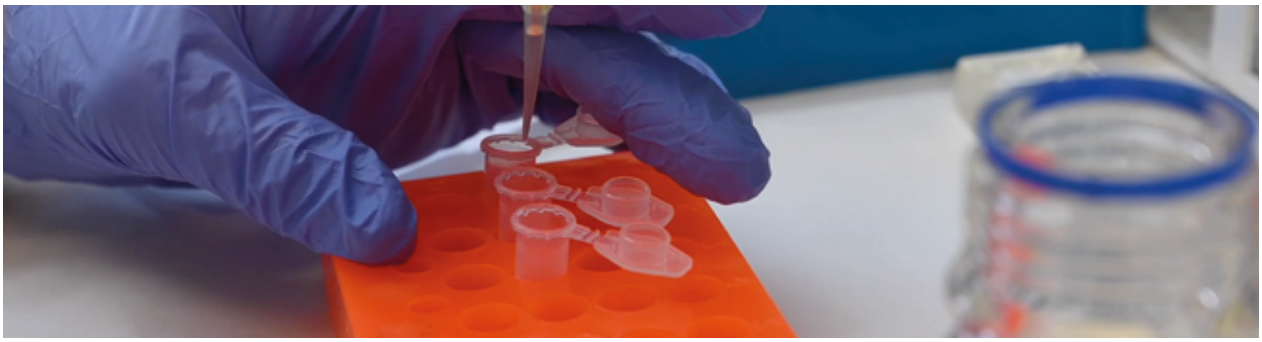
Juan Carlos Alonso
Antonio Leyva
Florencio Pazos
Hugh Reyburn
Juan José Sanz
José María Valpuesta

**TRAINING ADVISORY COMMITTEE**

Yolanda Carrasco
Mark van Raaij
Vicente Rubio
Juan José Sanz
Javier Tamames
Miguel Vicente

**PhD STUDENTS COMMITTEE**

Alejandro Asensio
Lorena Bragg
Álvaro Ceballos
Marta Cobo
Alberto Fuster
Sofía Gardeta
Andoni Gómez
Marcos Gragera
Diego Jiménez
Javier López-Ibáñez
Micaela Navarro
Andrés París
Elena Sánchez
Jesús Vallejo



# PhD fellowships

**2 LA CAIXA INPHINIT FELLOWSHIPS**

*La Caixa Foundation*

María José Felgueres Planells

Arturo Daniel García Vesga

**10 FPU FELLOWSHIPS**

*Ministry Of Education, Culture And Sport*

Neus Daviu Bou

Elisabet Díaz Beneitez

Álvaro Fernando García Jiménez

Aitor Jarit Cabanillas

Elia Marcos Grañeda

José Martín Gómez

Almudena Méndez Pérez

María Jesús Rodríguez Espinosa

Ainhoa Ruiz Iglesias

Martín Sastre Gallardo

**5 FPI SEVERO OCHOA FELLOWSHIPS**

*Ministry of Science and Innovation*

Ana Cayuela López

Rafael García López

Alejandro López Hurtado

Jonathan Gabriel Piccirillo

Adriana Quijada Freire

**1 FIS FELLOWSHIP**

*Ministry of Science and Innovation*

Esmeralda Cebrian Sastre

**20 FPI FELLOWSHIPS**

*Ministry of Science and Innovation*

Alba Cabrera Fisac

Christian Camilo Cortés García

David Egea Benavente

Daniel Fernández Soto

Margarita Ferriz Salcedo

Carlos García Crespo

Marta García López

Samuel García Poveda

Sofía Rosa Gardeta Castillo

David Gil Cantero

Teresa Gil Gil

Marina Higuera García

Leticia Lucero López

Luis Miguel Luengo Cerrón

Mikel Marín Baquero

Iris Martínez Hevia

Diego Martínez Rey

Aitor Muñoz López

Elena Pares Guillen

Irene Varela Martínez

# Undergraduate and master students fellowships

## CSIC Introduction to Research Fellowships

**23 JAE INTRO**

Gonzalo María Aizpurua de Arteche

Julio César Aragón Lago

Sandra María Camuñas Alberca

Irene Castells Yus

Luis Castillo Cantero

Odette Deen Rozalen

Daniel del Hoyo Gómez

José María Fernández Palacios

Jorge García Condado

Juan García-Agullo Rivera

Darío López García

Iván Martín Martín

Natalia Martínez Puente

Almudena Méndez Pérez

Alberto Manuel Parra Pérez

Sergio Pipaón Alcibar

Julia Purificación Casino

Irati Rincón Santoyo

Marta Sánchez Diez

Paula Sánchez Sánchez

Henry Patricio Secaira Morocho

Carlos Wert Carvajal

Ana Carmen González Brenes

**10 JAE INTRO-SOMMA**

Yolanda Benítez Quesada

Nicolae Ciobu

Lucia de Dios Blázquez

Jorge Huete Carrasco

Alba Esteli Murillo Sánchez

Sara Otaegi Ugartemendia

Cesar Palacios Cuellar

Álvaro Redondo del Río

Ángel Ruiz Enamorado

Jesús Vílchez García

**6 JAE INTRO ICUS CNB (2019)**

*7th CNB Course Introduction to Research*

María González Álvarez

David Gutiérrez Baez

Javier Ortiz Rivero

Sergio Polo Nicoli

Patricia Rus Fernández

Gustavo Adolfo Sánchez Corrales

# Doctoral theses

In 2019 and 2020, 63 students obtained the PhD degree under the supervision of CNB researchers.

## 2019

**JAVIER ARRANZ-NICOLÁS**

The metabolism of diacylglycerol in T cell tolerance regulation and tumor evasion.

(Isabel Mérida)

**NOELIA ARTEAGA RAMOS**

Identificación y caracterización de genes implicados en la variación natural para el patrón de tricomas en *Arabidopsis*.

(Carlos Alonso Blanco)

**PAULA BLANCO**

Inducible and acquired antibiotic resistance in *Stenotrophomonas maltophilia*.

(José Luis Martínez)

**JUAN JOSÉ CESTERO**

Remodelación del peptidoglicano de *Salmonella* por actividades ausentes en organismos no patogénicos.

(Francisco García del Portillo)

**JUAN DÍAZ COLUNGA**

Mitochondrial control of gene expression and extrinsic apoptosis.

(Francisco J. Iborra Rodríguez and Raúl Guantes Navacerrada)

**ALEJANDRA ESCÓS LÓPEZ**

New insights in p38MAPK function and potential value as therapeutic target for high-prevalence diseases.

(Ana Cuenda)

**MARTA GARCÍA LEÓN**

Unraveling the role of *Arabidopsis* ALIX in the trafficking and turnover of abscisic acid receptors.

(Vicente Rubio)

**MOISÉS GARCÍA SERRADILLA**

Estudio de la capacidad antiviral de Ribavirina y Nano-partículas de plata en células infectadas con Bunyavirus mediante técnicas de imagen.

(Cristina Risco Ortiz)

**MARTA HERVÁS GARCÍA**

Estudio de las modificaciones post-traduccionales que afectan a la proteína de la cápsida del Plum pox virus y su papel en el desarrollo del ciclo viral.

(Juan Antonio García and Sandra Martínez Turiño)

**Mª DE LOS ÁNGELES HUESO GIL**

Refactoring the interplay of *Pseudomonas putida* with solid surfaces for programming lifestyle decisions.

(Víctor de Lorenzo and Belén Calles)

**SANTIAGO JOSA DE RAMOS**

Functional analysis of the non-coding mouse genome through bioinformatic and CRISPR tools.

(Lluís Montoliu)

**JULENE MADARIAGA MARCOS**

Magnetic tweezers and fluorescence to study DNA:protein interactions.

(Fernando Moreno-Herrero)

**CARMEN MAÑAS TORRES**

Engineering *Escherichia coli* to target bladder and colon tumour cells and characterization of the adhesion process.

(Luis Ángel Fernández)

**ALEJANDRO MARTÍN GONZÁLEZ**

AFM characterization of DNA-binding proteins involved in the repair and organisation of DNA.

(Fernando Moreno-Herrero)

**MIGUEL ÁNGEL MARTÍN SERRANO**

Validación de las quinasas de éstres p38MAPKs como nuevos biomarcadores tumorales. Análisis de su papel en el cáncer de colon asociado a colitis.

(Ana Cuenda and Juan José Sanz-Ezquerro)

**ANA MARTÍN LEAL**

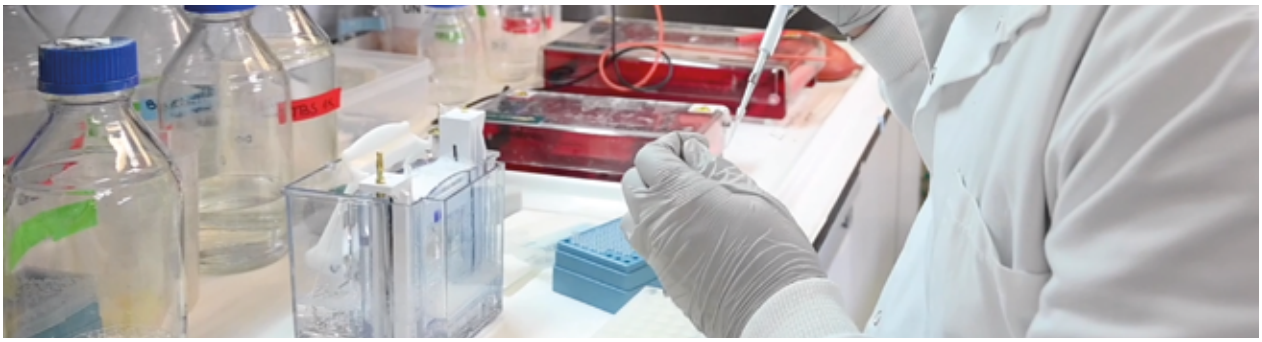
Papel del CCR5 en la oligomerización del TCR y su relevancia en la respuesta de las células T CD4 de memoria.

(Santos Mañes and Raquel Blanco)

**GONZALO MARTÍNEZ MARTÍNEZ**

Study of membrane proteome of DGKz-deficient cytotoxic T lymphocites.

(Isabel Mérida and Severine Gharbi)



**SARA V. MERINO CORTÉS**

El ácido fosfatídico producido por la DGKζ regula la respuesta de las células B a través del control del citoesqueleto de actina y la adhesión mediada por integrinas.

(Yolanda R. Carrasco)

**MIGUEL MIÑAMBRES**

Natural variation for phosphate starvation responses in *Arabidopsis*: new insights from gene expression QTL analyses in a recombinant inbred line population.

(Javier Paz-Ares)

**CARMEN MORA GALLARDO**

Characterization of the DIDO3-SFPQ axis in alternative splicing.

(Carlos Martínez-A and Karel van Wely)

**ANDRÉS ORTIGOSA**

Role of MYC transcription factors in photomorphogenesis and stomatal defence.

(Roberto Solano)

**MARÍA PEÑUELAS HORTELANO**

Functional Characterization of MYCs TFs in *Marchantia polymorpha*.

(Roberto Solano)

**MERCEDES PÉREZ-OLIVARES**

Max function in B lymphocyte differentiation.

(Ignacio Moreno de Alborán)

**ADRIANA PÉREZ PORTILLA**

Estudios sobre la inmunogenética de inmunodeficiencias primarias.

(Hugh Reyburn)

**PATRICIA PÉREZ RAMÍREZ**

Novel vaccines base on poxvirus vector MVA against human viral diseases HIV/AIDS and Zika.

(Mariano Esteban and Juan García-Arriaza)

**MARÍA DEL MAR PÉREZ RUIZ**

Structure and function of the components of the core of T7 bacteriophage, a DNA translocation complex.

(José L. Carrascosa)

**ANTONIO PICHEL BELEIRO**

Structure determination of receptor-binding proteins and baseplate of *Staphylococcus* phage K, a therapeutic phage for control of MRSA.

(Mark J. van Raaij)

**MARÍA QUIRÓS MARÍN**

Aumento de la inmunogenicidad de una vacuna contra la hepatitis C (MVA-HCV) basada en el virus vaccinia modificado de Ankara (MVA).

(Mariano Esteban and Juan García-Arriaza)

**AÍDA REVILLA GARCÍA**

Transmisibilidad, agregación cruzada y toxicidad de la proteína similar a príones RepA-WH1 en cultivos celulares de mamífero.

(Rafael Giraldo)

**ANA ISABEL RODRÍGUEZ**

Bases moleculares de la virulencia y la resistencia en *Escherichia coli*: mutación, recombinación y transferencia horizontal.

(Jesús Blázquez and Jerónimo Rodríguez-Beltrán)

**SARA ROMÁN GARCÍA**

Funciones de la actividad adaptadora y catalítica de la proteína tirosina kinasa de Bruton en la respuesta de las células B.

(Yolanda R. Carrasco)

**MARTA SANZ GAITERO**

Crystallographic structure determination of bacteriophage-encoded enzymes that specifically target pathogenic bacteria.

(Mark J. van Raaij)

**LAURA SANZ ORTEGA**

Análisis del uso combinado de nanopartículas magnéticas y campos magnéticos externos para dirigir células linfoides hacia una región de interés y de su potencial en terapias de transferencia adoptiva celular en cáncer.

(Domingo F. Barber)

**RUBÉN TORRES SÁNCHEZ**

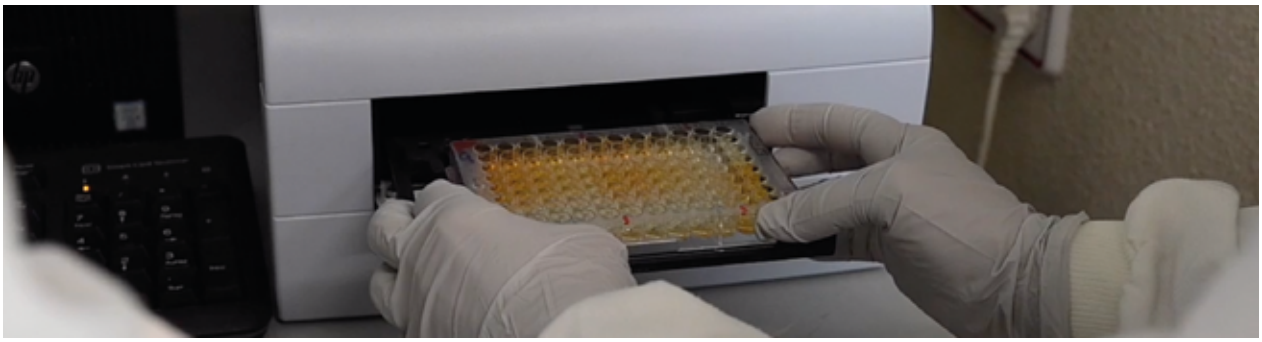
*Bacillus subtilis* RadA/Sms and RecA contribute in concert to double-strand break repair and natural transformation, and with DisA to DNA damage tolerance.

(Juan Carlos Alonso)

**JOSÉ LUIS VILAS PRIETO**

Local quality assessment of cryo-EM reconstructions and its applications.

(Carlos Oscar Sorzano-Sánchez and Javier Vargas)



## 2020

**IVÁN CAMILO ACOSTA GARCÍA**

A membrane remodelling system for OXPHOS activity in *Staphylococcus aureus*.

(Daniel López)

**TERESA BUENO CARRASCO**

The quasi-atomic structure of human tyrosine hydroxylase by cryo-electron microscopy: functional implications.

(José María Valpuesta and Jorge Cuellar)

**JAVIER CANTÓN BAILÓN**

Relevancia de la proteína 4b de MERS-CoV en el antagonismo de la respuesta inmune innata y la virulencia.

(Isabel Sola and Luis Enjuanes)

**LIDIA CERDÁN GARCÍA**

Construction and validation of a large naïve library of VHHs integrated in the chromosome of *E. coli* for selection of nanobodies using bacterial display.

(Luis Ángel Fernández)

**MARTA COBO SIMÓN**

Ecology of marine microorganisms: biodiversity, genomics and metagenomics.

(Javier Tamames & Carlos Pedrós-Alió)

**DIANA DAMIÁN APARICIO**

Mechanism of regulation of flotillin levels by the staphylococcal accessory regulator SarA.

(Daniel López)

**CHARLOTTE DESSAUX**

Dynamics of *Listeria monocytogenes* stressosome proteins in response to osmotic stress and the intracellular eukaryotic niche.

(Francisco García del Portillo and M. Graciela Pucciarelli)

**DANIEL FUENTES MARTÍNEZ**

Estudio de los complejos replicativos del virus de la bursitis infecciosa (IBDV) y análisis de la función de la proteína VP5.

(José F. Rodríguez and Dolores Rodríguez)

**MARCOS GRAGERA CABEZUDO**

Biophysical characterization of a chaperone complex involved in macroautophagy.

(José María Valpuesta and Rosario Fernández)

**JAVIER GUTIÉRREZ ÁLVAREZ**

Coronavirus causante del síndrome respiratorio de Oriente Medio: Patología y Protección.

(Luis Enjuanes and Isabel Sola)

**FERNANDO GUTIÉRREZ DEL BURGO**

DIDO3 organiza la red génica que regula la especificación y el destino de las células B.

(Carlos Martínez-A and Ricardo Villares)

**LAURA HERNÁNDEZ VILLARRUBIA**

Caracterización del sistema inmune Innato de la cavidad peritoneal: papel en la defensa frente a infecciones bacterianas intraperitoneales.

(Carlos Ardavín and María López Bravo)

**ADRIÁN LÁZARO FRIAS**

Generación de candidatos vacunales basados en el MVA frente a los ebolavirus Zaire y Sudan.

(Mariano Esteban and Juan García-Arriaza)

**ALBERTO MARÍN GONZÁLEZ**

Combining molecular dynamics simulations and atomic force microscopy experiments to rationalize the mechanical properties of double-stranded DNA and RNA.

(Fernando Moreno-Herrero and Rubén Pérez)

**EVA MARTÍN SOLANA**

El atasco ribosomal y las alteraciones polisomales como mecanismo de toxicidad en la enfermedad de Huntington.

(María Rosario Fernández Fernández and José Jesús Fernández)

**PABLO MARTÍNEZ GÓMEZ**

Oligomerización de CXCR4, una nueva diana para modular las funciones mediadas por CXCL12.

(Mario Mellado)

**ALEJANDRO PASCUAL IGLESIAS**

Virus de la diarrea epidémica porcina: patogénesis y protección.

(Luis Enjuanes and Sonia Zúñiga)

**EVA PICO SÁNCHEZ**

Engineering of *E. coli* bacteria for targeting human and murine epithelial tumor cells expressing HER2 and PD-L1 markers and their application in the colonization of mouse bladder tumours in vivo.

(Luis Ángel Fernández)

**MANUEL OLAZABAL MORÁN**

Regulación fisiológica de PTEN tras a estimulación con factores de crecimiento.

(Ana Clara Carrera)

**ANA BELÉN PEÑAHERRERA PAZMIÑO**

Desarrollo de canales de microfluidica para estudio de crecimiento celular y análisis de flujo en medios porosos.

(José María Casasnovas)

**MARTA ROYO LLONCH**

Ecogenomics of uncultured marine prokaryotes.

(Silvia Acinas and Carlos Pedrós-Alió)

**FERNANDO SANZ-GARCÍA**

Predicción de la resistencia a antibióticos, intrínseca y adquirida, en *Pseudomonas aeruginosa*.

(José Luis Martínez and Sara Amado-Hernando)

**RUBÉN SÁNCHEZ GARCÍA**

Learning from data in structural bioinformatics: a protein-protein interaction study.

(José María Carazo García and Joan Segura Mora)

**JAVIER SANTOS ARENAL**

Identificación de cisteinil proteasas como mediadores de la disfunción de linfocitos citotóxicos inducida por PD-1. Implicaciones en la inmunoterapia del cáncer.

(Santos Mañes and Rosa Ana Lacalle)

**ADRIANA LUCÍA SANZ GARCÍA**

Multipartite Viruses. Organization, Emergence & Evolution.

(Susanna Manrubia)

**HÜSEYIN TAS**

Actualización de *Pseudomonas putida* como chasis de biología sintética mediante la interoperabilidad de dispositivos genéticos.

(Víctor de Lorenzo and Angel Goñi)

**MARIA-TSAMPIKA MANOLI**

Synthetic and systems biology approaches towards the optimization of polyhydroxyalkanoates metabolism in *Pseudomonas putida* KT2440.

(Juan Nogales)

**RABEA WAGNER**

The bacterial exo- and endo-cytoskeleton spatially confines functional membrane microdomains.

(Daniel López)

# Postdoctoral and Research Fellows

In the last two years, our centre attracted 12 talented young scientists through international, national and regional calls such as Marie Skłodowska-Curie Actions from the European Commission, Juan de la Cierva, Ramón y Cajal and Talent Attraction Programmes.

**1 RAMÓN Y CAJAL PROGRAMME**
Ministry of Science and Innovation
Adrián Alejandro Valli

**1 ATRACCIÓN DE TALENTO PROGRAMME**
Comunidad de Madrid
Pablo Pulido

**1 YOUNG INVESTIGATOR PROGRAMME**
Ministry of Science and Innovation
Selena Giménez Ibáñez

**1 MARIE SKŁODOWSKA-CURIE ACTIONS**
European Comission
Jorge García Marqués

**8 JUAN DE LA CIERVA PROGRAMME**
Ministry of Science and Innovation
Alejandra Gutiérrez González
Mercedes Hernando Pérez
Sophie Jayne Kneeshaw
Marcin Krupka
Vladimir Mulens Arias
Fernando Puente Sánchez
Gorjana Rackov
Luis Francisco Seoane Iglesias


## Biophysical studies on small protein domains to correlate folding, cooperativity, binding and macromolecular assembly

**Luis Alberto Campos Prieto**

*Ramón y Cajal Fellow*
*Macromolecular Structures Department*
*Associated with Dr José María Valpuesta's group*

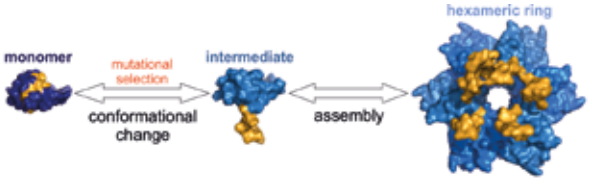
Protein folding cooperativity is the key to expand the protein behaviour in protein folding and binding. Thus, the cooperativity scale goes from intrinsically disordered proteins, with no cooperativity at all, to highly cooperative rigid folders, with few interesting phenomena inbetween, including "downhill" folders, moonlighting binding or metamorphic proteins.

I have focused my scientific interest in the study of small proteins with low cooperativity, applying protein engineering to modulate their folding. With this in mind, I have investigated the oligomerization of small proteins to form big macromolecular assemblies, creating a synthetic system where we have converted by mutations a rigid highly cooperative model into a metamorphic protein that forms stable hexameric rings in solution, and studied its functionalization with metal and/or nucleic acid binding or through protein fusion. Finally, I am applying single molecule techniques to investigate the dynamics of oligomerisation and expanding my studies to vesicles, formed of small proteins, with delivery capabilities.

**SELECTED PUBLICATIONS**

Campos LA, Sharma R, Alvira S, Ruiz FM, Ibarra-Molero B, *et al.* Engineering protein assemblies with allosteric control via monomer fold-switching. Nat Commun 2019, 10: 5703.

Campos LA, Sadqi M, Muñoz V. Lessons about Protein Folding and Binding from Archetypal Folds. Acc Chem Res 2020; 53: 2180-2188.




*Folding diagram for the new synthetic metamorphic protein created in the lab.*

## Light signalling and chromatin dynamics

**Sandra Fonseca**

*Ramón y Cajal Fellow*
*Plant Molecular Genetics Department*
*Associated with Dr Vicente Rubio's group*

**PERSONNEL**

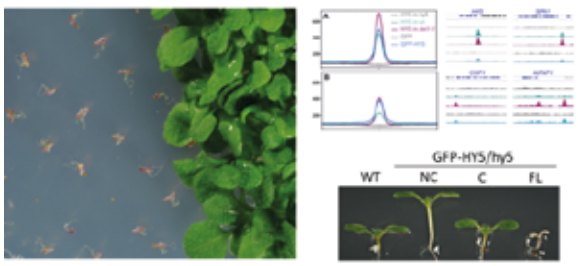
Esther Cañibano (PhD student, co-supervised with Dr V. Rubio)
Laura Gómez (master student)
Leticia Saez (undergraduate student)

Light fuels plant life and is an essential cue that modulates growth and development throughout all the plant life cycle. As sessile photoautotrophic organisms, plants evolved to capture light in an optimal manner and developed sophisticated strategies to perceive light signals and to transduce them into molecular signalling networks. Yet, high light intensities, as well as specific light wavelengths constitute an environmental stress that limits plant growth and development, especially if combined with other abiotic stimuli. My research focus is to understand the molecular mechanisms behind these responses, how they affect transcription and chromatin-associated events by employing, genetic, genomic and proteomic tools.

**SELECTED PUBLICATIONS**

Fonseca S, Rubio V. Arabidopsis CRL4 complexes: surveying chromatin states and gene expression. Front Plant Sci 2019; 10:1095.

Ortigosa A, Fonseca S, Franco-Zorrilla JM, Fernández-Calvo P, Zander M, et al. The JA-pathway MYC transcription factors regulate photomorphogenic responses by targeting HY5 gene expression. Plant J 2020; 102: 138-152.




*The COP/DET/FUS repressors are essential to maintain plant viability by limiting the activity of HY5 transcription factor to primary targets.*

## Molecular mechanisms regulating plant resistance against bacteria

**Selena Giménez Ibáñez**

*"Retos Jóvenes Investigadores" Fellow*
*Plant Molecular Genetics Department*
*Associated with Dr Roberto Solano's group*

**PERSONNEL**

Santiago Michavilla Puente-Villegas (PhD Student, co-supervised with Dr R. Solano)

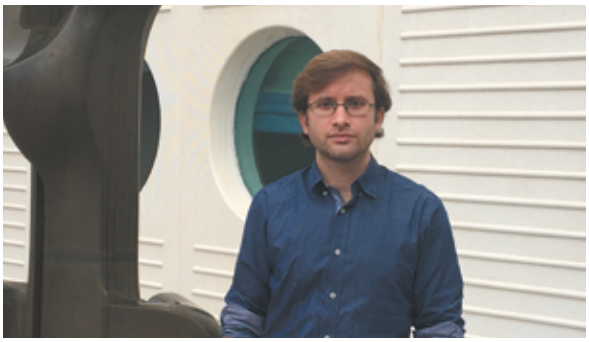
My research line falls into three areas of fundamental research, that are further combined with an additional directed applied line on important crops attacked by phytopathogenic *Pseudomonas* bacteria, such as tomato and kiwifruit. My research uses on one side, model plants such as *Arabidopsis*, *Nicotiana* and the liverwort *Marchantia*, to uncover the basic molecular mechanisms controlling hormonal plant immunity and how *Pseudomonas* bacteria infects hosts though its repertoire of effectors and phytotoxins. On the other side, this generated basic knowledge is directed to study these processes on crops, and to deliver novel strategies for crop protection against two of the most important disease caused by phytopathogenic *Pseudomonas*, the bacterial speck disease of tomato, caused by *P. syringae* pv. *tomato*, and the bacterial canker of kiwifruit, caused by *P. syringae* pv. *actinidiae*, by using biotechnology, genome editing, genetic breeding and searching for anti-infective potential novel chemicals among others. The aim is to gain knowledge into the molecular basis of hormonal plant immunity and infection by phytopathogenic *Pseudomonas*, towards the development of new solutions that could be applied into long-lasting strategies for crop protection against some of the most important diseases caused by *Pseudomonas* in crops, which negatively affect their cultivation worldwide.

**SELECTED PUBLICATIONS**

Ortigosa A, Gimenez-Ibanez S, Leonhardt N, Solano R. Design of a bacterial speck resistant tomato by CRISPR/Cas9-mediated editing of SlJAZ2. Plant Biotechnol J 2019; 17 (3): 665-673.

Gimenez-Ibanez S, Zamarreño A, Garcia-Mina JM and Solano R. An evolutionarily ancient immune system governs the interactions between *Pseudomonas syringae* and an early-diverging land plant lineage. Current Biology 2019; 29(14): 2270-2281.

Gimenez-Ibanez S. Designing disease-resistant crops: From basic knowledge to biotechnology. Mètode Science Studies Journal, n11, 2020 ISBN/ISSN: 2174-3487.



## Homeostatic and pathogenic contribution of Th2 immunity in cardiovascular disease

**Rodrigo Jiménez-Saiz**

*Junior Group Leader*
*Immunology and Oncology Department*

**PERSONNEL**

Elisa Zubeldia (Visiting PhD student)
Domenico Rosace (Visiting Scientist)

The goal of the Jiménez-Saiz Lab (https://www.jimenezsaizlab.com/) is to understand immunological principles of Th2 immunity in the context of allergic disease, particularly as it pertains to acute allergic reactions (anaphylaxis) and its modulation by the microbiota, the maintenance of IgE immunity (memory responses), and the impact of allergic disease in the development of other pathologies.

Currently, our main line of research merges the fields of allergy (Th2 immunity) and cardiovascular disease (CVD) to answer clinically relevant, fundamental questions, on a serious health, economic and social challenge: understanding the causal relationship amid these two growing and menacing diseases. We use pre-clinical models of allergy and CVD to investigate the impact of allergic pathology on CVD and to define the mechanisms mediating this process. The knowledge generated in our group will provide mechanistic understanding on the putative pathologic effect of allergic responses on CVD, which will pave the way for the identification of therapeutic targets.

**SELECTED PUBLICATIONS**

Jimenez-Saiz R, Anipindi VC, Galipeau H, Ellenbogen Y, Chaudhary R, *et al.* Microbial Regulation of enteric eosinophils and its impact on tissue remodeling and Th2 immunity. Front Immunol 2020; 11: 155.

Barrio L, Roman-Garcia S, Diaz-Mora E, Risco A, Jimenez-Saiz R, *et al.* B cell development and T-dependent antibody response are regulated by p38gamma and p38delta. Front Cell Dev Biol 2020; 8: 189.

Riggioni C, Comberiati P, Giovannini M, Agache I, Akdis M, *et al.* A compendium answering 150 questions on COVID-19 and SARS-CoV-2. Allergy 2020; 75 (10): 2503-41.

Sokolowska M, Lukasik ZM, Agache I, Akdis CA, Akdis D, *et al.*

Immunology of COVID-19: Mechanisms, clinical outcome, diagnostics, and perspectives-A report of (EAACI). Allergy. 2020; 75(10): 2445-76.

Bruton K, Spill P, Vohra S, Baribeau O, Manzoor S, Gadkar S, *et al.* Interrupting reactivation of immunologic memory diverts the allergic response and prevents anaphylaxis. J Allergy Clin Immunol 2020; S0091-6749 (20) 31763-2.

## Innate immunity, respiratory virus replication and pathogenesis

**Marta López de Diego**

*"Atracción de Talento" Fellow*
*Molecular and Cellular Biology Department*
*Associated with Dr Luis Enjuanes and Dr Isabel Sola's group*

**PERSONNEL**

Laura Villamayor Coronado (Postdoctoral researcher)
Sandra Gómez López (Technician)
Darío López García (JAE-Intro Graduated student)

Influenza viruses and coronaviruses are respiratory pathogens with drastic health and economic consequences for many animal species, including humans. In our group we are interested in analysing virus host-interactions, particularly the innate immune responses induced after respiratory virus infections, since these host responses affect viral replication and pathogenesis. Our final goal is to use the knowledge generated in our research to develop new antivirals to fight these and other viral infections, and to analyse viral and host genetic factors affecting the severity of respiratory virus diseases. As such we are (i) studying the cellular functions of interferon-stimulated genes and the effect of these genes on virus replication, on the induction of innate immune responses and virus pathogenesis, (ii) studying the functional effects of mutations on influenza virulence genes on virus replication, and pathogenesis, (iii) evaluating the effect of genetic polymorphisms on innate immune response genes in the severity of the diseases induced by influenza and coronaviruses, and (iv) developing antivirals mainly targeting innate immune response proteins and viral proteins.

**SELECTED PUBLICATIONS**

Nogales A, DeDiego ML. Host single nucleotide polymorphisms modulating Influenza A virus disease in humans. Pathogens 2019; 8 (4): 168.

DeDiego ML, Nogales A, Martinez-Sobrido L, Topham DJ. Interferon-induced protein 44 interacts with cellular FK506-binding protein 5, negatively regulates host antiviral responses, and supports virus replication. mBio 2019; 10 (4): e01839-19.

DeDiego ML, Martinez-Sobrido L, Topham DJ. Novel Functions of IFI44L as a Feedback Regulator of Host Antiviral Responses. J Virol 2019; 93 (21): e01159-19.

Nogales A, Ávila-Pérez G, Rangel-Moreno J, Chiem K, DeDiego ML, Martínez- Sobrido L. A novel fluorescent and bioluminescent bireporter influenza a virus to evaluate viral infections. J Virol 2019; 93(10):e00032-19.

## Unravelling chloroplast protein quality control in plants

**Pablo Pulido**
"Atracción de Talento" Fellow
Plant Molecular Genetics Department
Associated with Dr. Vicente Rubio's group

**PERSONNEL**

Paloma Cabrerizo (undergraduate student)

Chloroplasts are the organelles that define plants. In plants, they are the unique sites of photosynthesis, the only significant mechanism of energy input into the biosphere. They also mediate numerous essential biosynthetic processes and contribute to many other functions including stress responses. As a result, correct chloroplast performance is absolutely indispensable for plant fitness and agriculture. Plants are sessile organisms that display an astonishing capacity to adapt to adverse conditions including heat, cold, drought, and salinity. However, prolonged exposure to environmental stress inevitably results in productivity losses. These challenging conditions for plant growth are highly relevant in the context of climate change and food security.

One of the main problems that stresses cause at molecular level is protein misfolding and aggregation. Recycling of damaged proteins is achieved by the action of molecular chaperones but, when recycling is not possible, toxic aggregated proteins have to be degraded by the action of proteases to avoid cellular damage. Chaperones and proteases act coordinately and constitute protein quality control (PQC) systems that are required for organismal survival. In our project, we address the characterization of the chloroplast proteostasis network. It is long known for instance that the chaperone HSP70 posttranslationally regulates important chloroplast processes such as photosynthesis. However, the precise molecular mechanisms of the chaperone action remain unresolved. Importantly, the specificity of HSP70 is driven by its DNAJ partners, adaptors that recognise unfolded substrates and transfer them to the chaperone for refolding. Thus, DNAJs are useful tools for plant editing. Besides, disrupted proteostasis results in protein aggregation inside chloroplasts triggering a chloroplast-to-nucleus retrograde signal that regulates the expression of nuclear genes encoding plastid-targeted chaperones. Ultimately, an essential hallmark of the project is to gain knowledge for rational engineering of chloroplast proteostasis and nuclear reprogramming that will assist to manipulate crops stress resistance.

## Plant-Virus Coevolution

**Adrian A. Valli**
Ramón y Cajal Fellow
Plant Molecular Genetics Department
Associated with Dr Juan Antonio García's group

**PERSONNEL**

Irene Gonzalo Magro (Technician)
Rafael García Lopez (PhD Student)
Alfonso González de Prádena (PhD Student, co-supervised with Dr J.A. García)
Julio César Aragón Lago (Graduate Student JAE-INTRO)

RNA viruses are among the most abundant and economically relevant pathogens infecting plants; indeed, they cause more than 50% of viral crop damage worldwide. Gaining insight about this group of viruses is then critical to reveal and understand new features of them and discover novel plant protein networks acting as defensive barriers. Intriguingly, despite the importance of plant RNA viruses for food security, it is surprising to find that very little is known about their RNA-dependent RNA polymerases (RdRPs), putative RdRP protein partners and the precise role/s of these partners during infection.

As a relevant socio-economical case we currently study the partnership between RdRP and the pyrophosphatase HAM1 deriving from Ugandan cassava brown streak virus, one the agents causing the "Ebola of plants" in cassava, which is a plant that belongs to the huge *Euphorbiacea* family and is the fourth most important crop on earth. To do that we follow a multidisciplinary study that includes (i) synthetic biology to build chimerical infectious clones, (ii) genomics studies to define viral quasispecies variability, (iii) structural studies by cryo-electron microscopy to define protein structures, (iv) metabolomics studies by HPLC-MS/MS to understand viral diseases, and (v) viral ecology to decipher the interaction between viruses and euphorbiaceous in nature. These approaches will greatly help us to fill gaps in our understanding of RdRPs in general, as well as the RdRP-HAM1 partnership.

**SELECTED PUBLICATIONS**

Ochoa J, Valli A, Martín-Trillo M, Simón-Mateo C, García JA, Rodamilans B. Sterol isomerase HYDRA1 interacts with RNA silencing suppressor P1b and restricts potyviral infection. Plant Cell Environ 2019; 42: 3015-3026.

González de Prádena A, Sánchez-Jiménez A, San León D, Simmonds P, García JA, Valli, AA. Plant virus genome is shaped by specific dinucleotide restrictions that influence viral infection. mBio 2020; 11: e02818-19.

# CNB seminars

In 2019 and the beginning on 2020, the CNB hosted around 150 seminars, including talks by international renowned institutions speakers. To overcome the difficulties of inviting speakers during COVID-19 pandemic situation, we started holding online seminars (20), which has become a new opportunity to reach wider audiences.

## SEMINARS CYCLE 2019

**1 MARCH**

Genomics of the origin and evolution of citrus

**Manuel Talón**

*Centro de Genómica IVIA, Spain*

**22 MARCH**

The power of cryo-EM to elucidate biological mechanisms

**Stephan Rausner**

*Max Plank Institute of Molecular Physiology, Germany*

**5 APRIL**

Interplay between mutation supply and relative fitness in the evolution of antibiotic resistance

**Diarmaid Hughes**

*Uppsala University, Sweden*

**12 APRIL**

Uncovering the hidden half of plant development

**Malcom Bennet**

*School of Biosciences, University of Nottingham, UK*

**26 APRIL**

Mechanisms of leukocyte extravasation across post capillary venules of the brain: The role of the endothelial basement membrane and matrix metalloproteinases

**Lydia Sorokin**

*Institute of physiological Chemistry and Pathobiochemistry, University of Muenster, Germany*

**17 MAY**

The Human Protein Atlas and insights from profiling plasma proteomes

**Jochen Schwenk**

*School of Biotechnology, KTH Royal Institute of Technology, Sweden*

**24 MAY**

Immunotherapy and new GTPase-mediated molecular mechanisms for the treatment of ALK tumors

**Roberto Chiarle**

*Boston Children Hospital, Harvard Medical School, USA*

**20 SEPTEMBER**

A lab of one's own: Science and Suffrage in the First World War

**Patricia Fara**

*Clare College Cambridge, UK*

**15 NOVEMBER**

A new perspective into the origin of animals

**Iñaki Ruiz-Trillo**

*Institut de Biologia Evolutiva (CSIC - IBE), Spain*

**22 NOVEMBER**

Role of CRISPR-Cas systems associated to retrotranscriptases in the defence against phages

**Antonio Sánchez Amat**

*Universidad de Murcia, Spain*

## JUNIOR SEMINARS 2019

**11 JANUARY**

Forward thinking: pro-active coordination of shoot architecture by long distance hormonal signalling in plants

**Tom Bennett**

*University of Leeds, UK*

**08 FEBRUARY**

Signal and noise – New tools for cryo-EM density interpretation

**Arjen Jakobi**

*Kavli Institute, The Netherlands*

**22 FEBRUARY**

Bacterial cell division: may the force be with you

**Mariana Gomes de Pinho**

*Instituto de Tecnologia Química e Biológica António Xavier, Universidad Nova de Lisboa, Portugal*

**15 MARCH**

Engineering neurogenesis for the postnatal cerebral cortex

**Benedikt Berninger**

*King's College, London*

**10 MAY**

Dealing with change and uncertainty: optimal growth control across environments and individuals

**Benjamin Towbin**

*Friedich Miescher Institute for Biomedical Research, Switzerland*

**14 JUNE**

Nuclear mechanobiology in cancer cell migration and muscular dystrophy

**Jan Lammerding**

*Well Institute for Molecular and Cellular Biology, Cornell University, USA*

**27 SEPTEMBER**

Probing bacterial regulation strategies by quantitative analysis of growth and death in variable environments

**Ulrich Gerland**

*Technical University of Munich, Germany*

**4 OCTOBER**

Chemoreceptor based signaling in bacteria

**Tino Krell**

*Estación Experimental del Zaidín, Spain*

**8 NOVEMBER**

Structural insights into the infection process of bacteriophages

**Nicholas Taylor**

*Novo Nordisk Foundation Center for Protein Research, Faculty of Health and Medical Sciences, University of Copenhagen, Denmark*

**29 NOVEMBER**

Plant signal transduction cascades - from phenotypes to atoms and back

**Michael Hothorn**

*Department for Botany and Plant Biology, University of Geneva, Switzerland*

## SEMINARS CYCLE 2020

**10 JANUARY**

Engineering Genetic Control Systems

**Mustafa Khammash**

*ETH Zürich, Switzerland*

**14 FEBRUARY**

Tara Oceans: eco-systems biology at planetary scale

**Chris Bowler**

*École Normale Supérieure Paris, France*

**23 OCTOBER**

Conversion of *E. coli* to generate all biomass carbon from $CO_2$

**Ron Milo**

*Weizmann Institute of Science, Rehovot, Israel*

**30 OCTOBER**

Zooming in on the coronavirus replication organelle

**Montserrat Bárcena**

*Leiden University Medical Center, The Netherlands*

**6 NOVEMBER**

Sensing matrix rigidity: transducing mechanical signals from integrins to the nucleus

**Pere Roca-Cusachs**

*IBEC, Instituto de Bioingeniería de Cataluña, Spain*

**13 NOVEMBER**

Role of titan cells in the virulence of the pathogenic yeast *Cryptococcus neoformans* and new therapeutical approaches

**Oscar Zaragoza**

*National Centre for Microbiology, ISCIII, Spain*

**27 NOVEMBER**

Host microbe interactions in the intestine in health and disease

**Fiona Powrie**

*Kennedy Institute of Rheumatology and Translational Medicine, University of Oxford, UK*

## JUNIOR SEMINARS 2020

**17 JANUARY**

The global ocean microbiome through the lens of metaomics

**Shinichi Sunagawa**

*ETH Zürich, Switzerland*

**31 JANUARY**

Influenza virus-host interactions

**Adolfo García-Sastre**

*Icahn School of Medicine at Mount Sinai, USA*

**21 FEBRUARY**

Novel targets and biomarkers of PD-1 inhibitory function

**Vassiliki Boussiotis**

*Beth Israel Deaconess Medical Center. Boston, USA*

**9 OCTOBER**

Plasma membrane-to-chloroplast communication: learning from viruses

**Rosa Lozano-Duran**

*Shangai Center for Plant Stress Biology (Chinese Academy of Sciences), China*

**16 OCTOBER**

Integrins in immune cells: New roles for old players

**Susanna Fagerholm**

*Faculty of Biological and Environmental Sciences, University of Helsinki, Finland*

**10 NOVEMBER**

The immune system of bacteria: Beyond CRISPR

**Rotem Sorek**

*Weizmann Institute of Science Rehovot, Israel*

**20 NOVEMBER**

Breath of life: oxygen sensing across eukaryotic kingdoms

**Francesco Licausi**

*Wadham College, Oxford University, UK*

**4 DECEMBER**

Systems biology and model-based analysis of multi-omic microbiome data

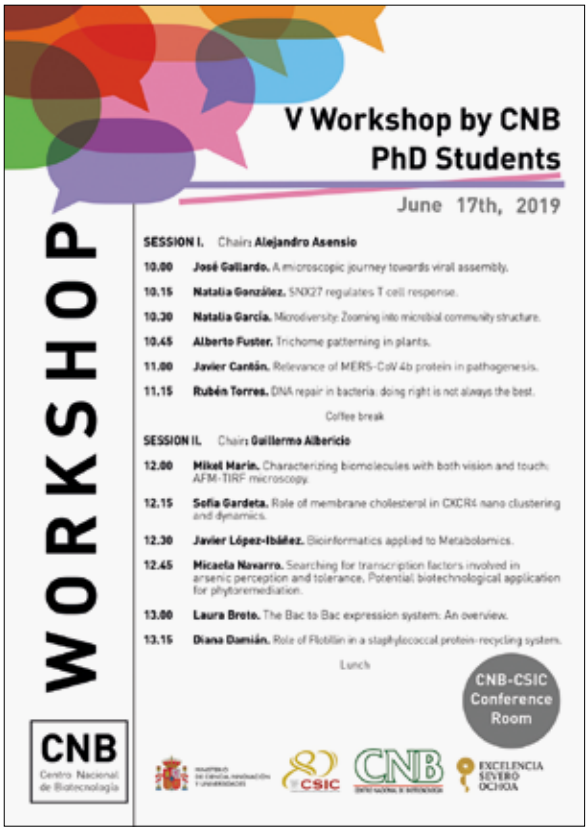
**Elhanan Borenstein**

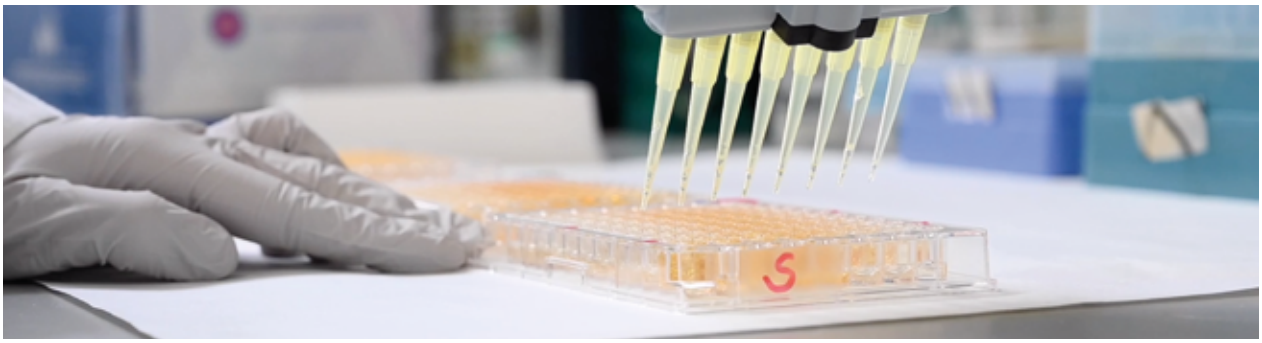
*Blavatnik School of Computer Science & Sackler Faculty of Medicine, Tel Aviv University, Israel*


Looking at Cell Biology From a Virus Perspective
A tribute to Amelia Nieto on her retirement
Wednesday January 29, 2020 Lecture Hall CNB
11:45 Symposium Opening by the CNB Director
Scientific Program
Session 1. Chair: Pablo Gastaminza
12:00 Ana Falcón
Algenex, Madrid, Spain
Human Influenza A virus causes heart infection, cardiac conduction disorders and premature death
12:15 Santiago F. González
Institute for Research in Biomedicine, Università della Svizzera italiana. Bellinzona, Switzerland
Protection against influenza virus requires early recognition by inflammatory dendritic cells through C-type lectin receptor SIGN-R1
12:30 Emilio Yángüez
Functional Genomics Center (ETH/UZH) Zurich. Zurich, Switzerland
Combination of scRNA-seq strategies to untangle complex cell populations
12:45 Ariel Rodríguez
Sanford Burnham Prebys Medical Discovery Institute. La Jolla, CA, USA.
Identification of new host restriction factors affecting influenza A virus replication in primary human respiratory epithelial cells
13:00 Alicia Pérez
Spanish Agency for Medicines and Medical Devices (AEMPS). Madrid, Spain
From virus-cell interaction to vaccine regulation
13:15 Maite Huarte
Centro de Investigación Médica Aplicada (CIMA-UNAV). Pamplona, Spain
lncRNAs as functional molecules in cancer pathways
13:30 Tomás Aragón
Centro de Investigación Médica Aplicada (CIMA-UNAV). Pamplona, Spain
XBP1 mRNA regulation: A serendipitous path
13:45 Juanjo Sanz-Ezquerro
Centro Nacional de Biotecnología (CSIC). Madrid, Spain
Embryonic development in vertebrates: signalling pathways and genes
Session 2. Chair: Urtzi Garaigorta
15:15 Puri Fortes
Centro de Investigación Médica Aplicada (CIMA-UNAV). Pamplona, Spain
From RNA viruses to oncogenic long non-coding RNAs
15:30 Susana de la Luna
ICREA and Center for Genomic Regulation (CRG). Barcelona, Spain
A tale of RNA polymerases
15:45 Juan Valcárcel
ICREA and Center for Genomic Regulation (CRG). Barcelona, Spain
Mechanisms of alternative splicing regulation in cancer
Amelia Nieto, PhD
Scientific Researcher
CNB-CSIC
16:00 Homenaje a Amelia Nieto
con intervenciones de
Pablo Gastaminza
Urtzi Garaigorta
Juanjo Sanz-Ezquerro
María Ángeles Rodríguez
Margarita Díaz Guerra
Blanca García-Barreno
Tomás Aragón
Nani Marión
Juan Ortín
Laura Marcos
Noelia Zamarreño
The Company of Biologists
https://www.biologists.com/


Biology for the
21st Century
May 20th 2019
Venue:
Centro Nacional de Biotecnología (CNB)
C/ Darwin 3.Carretera de Colmenar Km 16,
Campus UAM, 28049 Madrid
PROGRAM
09:30-09:35
Welcome by the CNB director
09:35-09:45
A few words from the CSIC President
09:45-10:00
A few words from the Deputy Minister of Science
SCIENTIFIC SESSION
10:00-10:45 FREDERICK ALT, Boston Children's Hospital, Harvard Med Sch., Boston, MA, USA
The Fundamental Role of Chromatin Loop Extrusion in Antibody Diversification
10:45-11:30 JUAN CARLOS IZPISUA BELMONTE, Salk Institute for Biological, CA, USA
Aging and Organ Regeneration
11:45-12:30 SERGIO LIRA, Icahn School of Medicine at Mount Sinai, NY, USA
IL-23 + bugs + X = colitis
12:30-13:15 TAK MAK, The Campbell Family Institute for Breast Cancer Research, Toronto, Canada
Does the Immune System Think?
13:15-14:00 Antonio Coutinho, Instituto Gulbenkian de Ciência, Portugal
An Experiment on Graduate Education


Cincuenta Aniversario
UAM
CSIC
25 YEARS OF CRYOELECTRON MICROSCOPY IN SPAIN: A TRIBUTE TO
JOSÉ L. CARRASCOSA
Madrid, 12-13 June 2019
Lecture Hall School of Biology Universidad Autónoma de Madrid
Plenary Speakers
Wolfgang Baumeister
MPI Martinsried
Joachim Frank
Columbia University
Nobel Prize in Chemistry 2017
Richard Henderson
LMB Cambridge
Nobel Prize in Chemistry 2017
Alasdair Steven
NIH Bethesda
Speakers
N. Abrescia (CIC-bioGUNE)
J. Agirre (University of York)
S. Alvira (University of Bristol)
E. Arias-Palomo (CIB-CSIC)
J.M. Carazo (CNB-CSIC)
D. Castaño-Díez (Biozentrum)
P. Chacón (IQFR-CSIC)
M. Coll (IBMB-CSIC)
J. Conesa (ALBA)
S. Connell (CIC-bioGUNE)
J.J. Fernández (CNB-CSIC)
R_F. Fusnadiego (MPI Martinsried)
C. Fernández Tornero (CIB-CSIC)
I. Fita (IBMB-CSIC)
J. Fontana (University of Leeds)
B. Herguedas (LMB)
A. Hierro (CIC bioGUNE)
D. Lietha (CIB-CSIC)
O. Llorca (CNIO)
C. López-Iglesias (Maastricht University)
D. Luque (IISCIII)
J. Martín-Benito (CNB-CSIC)
A. Martínez (MPI Martinsried)
J. Ortega (McGill University)
P. Pérez Navarro (Biozentrum)
V. Rubio (IBV-CSIC)
José R. Castón (CNB-CSIC)
M. Saensó (Virginia C. University)
C. San Martín (CNB-CSIC)
I. Ubarretxena (Biofísika)
I. Usón (IBMB-CSIC)
M. Valle (CIC-bioGUNE)
J.M. Valpuesta (CNB-CSIC)
J. Vargas (McGill University)
ThermoFisher SCIENTIFIC
CNB
EXCELENCIA SEVERO OCHOA


WORKSHOP
V Workshop by CNB
PhD Students
June 17th, 2019
SESSION I. Chairs: Alejandro Asensio
10.00 José Gallardo. A microscopic journey towards viral assembly.
10.15 Natalia González. SNX27 regulates T cell response.
10.30 Natalia García. Microdiversity: Zooming into microbial community structure.
10.45 Alberto Fuster. Trichome patterning in plants.
11.00 Javier Cantón. Relevance of MERS-CoV 4b protein in pathogenesis.
11.15 Rubén Torres. DNA repair in bacteria: doing right is not always the best.
Coffee break
SESSION II. Chairs: Guillermo Albericio
12.00 Mikel Marin. Characterizing biomolecules with both vision and touch: AFM-TIRF microscopy.
12.15 Sofía Gardeta. Role of membrane cholesterol in CXCR4 nano clustering and dynamics.
12.30 Javier López-Ibáñez. Bioinformatics applied to Metabolomics.
12.45 Micaela Navarro. Searching for transcription factors involved in arsenic perception and tolerance. Potential biotechnological application for phytoremediation.
13.00 Laura Brote. The Bac to Bac expression system. An overview.
13.15 Diana Damián. Role of Flotillin in a staphylococcal protein-recycling system.
Lunch
CNB-CSIC Conference Room
CNB Centro Nacional de Biotecnología
CSIC
CNB
EXCELENCIA SEVERO OCHOA



# Scientific meetings and courses

CNB researchers have participated in the organisation of almost 50 conferences, workshops and courses in the last two years.

## 2019

**11 FEBRUARY (CNB)**
Programmability and predictability of Biological Systems
**Víctor de Lorenzo, Juan Nogales, Juan Poyatos**

**15 FEBRUARY (CNB)**
Neurodevelopmental disorders and brain repair symposium
**Marta Nieto**

**5-29 MARCH (CNB)**
Training course: Biotechnology facing the challenges of today's society
**José Manuel Franco and Leonor Kremer**

**13-15 MARCH**
*Madrid, Spain*
CECAM workshop: From sequences to functions: challenges in the computation of realistic genotype-phenotype maps
**Susanna Manrubia, José A. Cuesta**

**20 MAY (CNB)**
Biology of the 21st Century
**Ana Clara Carrera, Isabel Mérida, Mario Mellado**

**22-24 MAY**
*Alcalá de Henares, Spain*
Instruct Biennial 2019
**José María Carazo**

**12-13 JUNE (CNB)**
25 years of cryoelectron microscopy in Spain: a tribute to José L. Carrascosa
**Jose María Carazo, José R Castón, Jose María Valpuesta**

**16-21 JUNE**
*Miraflores de la Sierra, Spain*
VIII National Genetic Course
**Almudena Fernández and Lluís Montoliu**

**17 JUNE (CNB)**
Predoctoral Scientific Workshop
**CNB PhD Student's Committee**

**19-22 JUNE**
*London, UK*
Invadosome consortium 7th meeting: Mechano-chemical signals in invasion
**Inés M Antón**

**26-29 JUNE**
*Salamanca, Spain*
3rd European Chemokine and Cell Migration Conference
**Mario Mellado**

**26-28 JUNE**
*Valencia, Spain*
GEIVEX Symposium on Extracellular Vesicles In Biomedicine
**Mar Valés-Gómez**

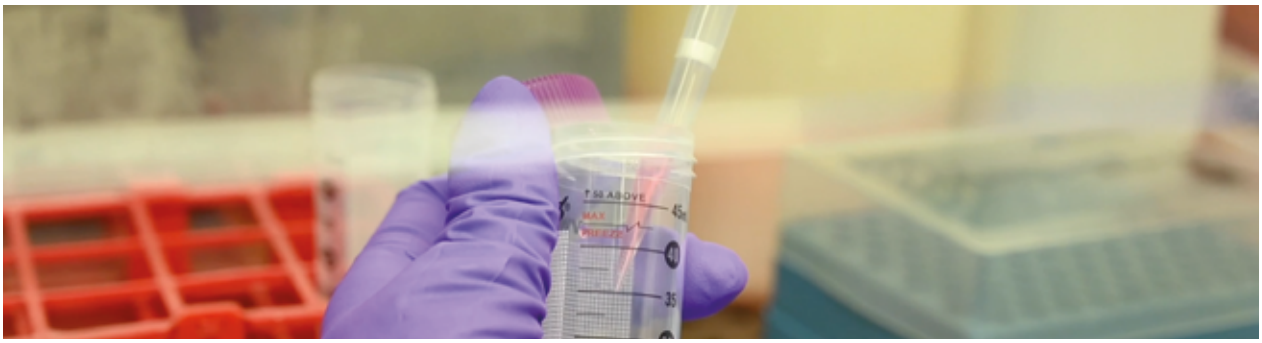
**1-2 JULY (CNB)**
II Practical course on Genome Editing and Gene Therapy
**Almudena Fernández and Lluís Montoliu**

**08-11 JULY**
*Madrid, Spain*
Instruct course on Image Processing for Electron Microscopy and hybrid modelling
**José María Carazo and Carlos Óscar Sorzano**

**16-19 JULY**
*Madrid, Spain*
42º Congreso de la Sociedad Española de Bioquímica y Biología Molecular
**Fernando Moreno-Herrero, Juan José Sanz (Biochemistry in the city)**

**16-19 JULY (CNB)**
Gene Regulation and Cell Signalling Symposium at the 42 SEBBM Congress
**Ana Cuenda**

**20-24 JULY**
*Madrid, Spain*
Evolutionary dynamics Symposium at the 12th EBSA and 10th ICBP-IUPAP Biophysics Congress
**Susanna Manrubia**



**20-24 JULY**

*Madrid, Spain*

12th EBSA and 10th ICBP-IUPAP Congress

**José María Valpuesta**

**1-13 SEPTEMBER**

*Madrid, Spain*

2nd Edition of the Instruct course on Image Processing for Electron Microscopy and hybrid modelling

**José María Carazo and Carlos Óscar Sorzano**

**11-13 SEPTEMBER**

*Madrid, Spain*

Microscopy at the Frontiers of Science 2019 (6th Joint Congress of the Spanish and Portuguese Societies of Microscopy)

**Carmen San Martín**

**15-22 SEPTEMBER**

*Heidelberg, Germany*

EMBO Practical Course: Synthetic Biology in Action: Bridging Natural/ Non-Natural

**Víctor de Lorenzo**

**5 NOVEMBER**

*Granada, Spain*

Biomarkers and EVs: concepts, advances and technical considerations. Hands-on GEIVEX workshop

**Mar Valés-Gómez**

**6-8 NOVEMBER**

*Madrid, Spain*

5th International GEIVEX symposium

**Mar Valés-Gómez**

**8 NOVEMBER**

*Edinburgh, United Kingdom*

From DNA to RNA synthesis, processing and cancer symposium

**Susana de Lucas**

**14 NOVEMBER**

*Paris, France*

2019 ARRIGE (Association for Responsible Research and Innovation in Genome Editing) annual meeting

**Lluís Montoliu**

**19 NOVEMBER (CNB)**

Emprendimiento e innovación: oportunidades desde la perspectiva de género

**Cristina Merino**

**22-23 NOVEMBER**

*Paris, France*

Workshop: Grant evaluation assessment for graduate students, Institute Pasteur

**Daniel López**

**25-27 NOVEMBER**

*Madrid, Spain*

IPAD-MD and INFRAFRONTIER Annual Meeting 2019

**Lluís Montoliu**

**28-29 NOVEMBER**

*Madrid, Spain*

2nd ASEICA Educational Symposium

**Ana Cuenda**

**16-17 DECEMBER (CNB)**

XXVII Scientific Workshop

**Susana de Lucas**

**19 DECEMBER (CNB)**

XXVII CNB Workshop “Advances in Molecular Biology by Young Researchers Abroad

**Inés M Antón, Susana de Lucas, Mar Valés, Silvia Ayora, Domingo F Barber, Urtzi Garaigorta, Sandra Fonseca, Juan Poyatos, Carmen San Martín**

## 2020

**29 JANUARY (CNB)**

Looking at Cell Biology From a Virus Perspective: A tribute to Amelia Nieto on her retirement

**Urtzi Garaigorta, Pablo Gastaminza, Laura Marcos, Susana de Lucas, Juan Ortín, Noelia Zamarreño**

**30-31 JANUARY**

*Madrid, Spain*

Understanding and reprogramming developmental visual disorders: from anophthalmia to cortical impairments

**Paola Bovolenta, Marta Nieto**

**JANUARY-JUNE**

*e-learning*

Curso de especialización en vesículas extracelulares

GEIVEX, Universidad Francisco de Vitoria

**Mar Valés-Gómez**

**7 FEBRUARY (CNB)**

Evolution of antibiotic resistance workshop

**José Luis Martínez, Álvaro San Millán, Jesús Blázquez**

**19 FEBRUARY (CNB)**

Latest advances in microscopy technologies

**Sylvia Gutiérrez-Erlandsson, José María Valpuesta**

**28 FEBRUARY (CNB)**

Colloquium on Systems and Synthetic Biology Mapping, understanding and engineering the microbiome

**Víctor de Lorenzo, Juan Nogales, Juan Poyatos, Javier Tamames**

**11-15 JUNE**

*Glasgow, UK (Online)*

FENS Forum

**Marta Nieto**

**3 AND 17 JUNE (CNB)**

2nd Simposium NanoBiocargo: design, development and production of nanocontainers and nanovehicles

**José R Castón, José María Valpuesta**

**29 JUNE**

*Online*

III Practical course on Genome Editing and Gene Therapy

**Almudena Fernández, Lluís Montoliu**

**26-30 OCTOBER**

*Online*

Instruct Course on the development of image processing workflows in streaming and structural data analysis components for Electron Microscopy

**José María Carazo, Carlos Óscar Sorzano**

**4-6 NOVEMBER**

*Online*

17th ASEICA International Congress

**Ana Cuenda**

**4-7 NOVEMBER**

*Online*

5th European Days of Albinism (5EDA)

**Lluís Montoliu**

**14 NOVEMBER**

*Online*

2020 ARRIGE annual meeting

**Lluís Montoliu**

**14-18 DECEMBER**

*Madrid, Spain*

Instruct virtual course on Single Particle Analysis by CryoEM

**José María Carazo, Carlos Óscar Sorzano**

**17 DECEMBER**

*Online*

GEIVEX-UFV / TeNTaCLES 2020 Minisymposium on EVs

**Mar Valés-Gómez**

**16-17 DECEMBER (CNB)**

*Online*

XXVIII CNB Scientific Workshop

**Susana de Lucas, Ricardo Villares**

**21 DECEMBER (CNB)**

*Online*

XXVIII CNB Workshop Advances in Molecular Biology by Young Researchers Abroad

**Inés M Antón, Susana de Lucas, Carmen San Martín, Mar Valés, Urtzi Garaigorta, Alvaro San Millán, Sandra Fonseca, Pablo Pulido, Juan Poyatos**