

Celebration of the Centennial of the Catalan Society for Biology, 1912–2012

# First International Conference of Biology of Catalonia (CIBICAT), 'Global questions on advanced biology' (Barcelona, 9–12 July, 2012)

**Josep Clotet**

President of the Organizing Committee  
Secretary General, Catalan Society for Biology

ON THE OCCASION OF THE CENTENNIAL of the Catalan Society for Biology (SCB, 1912-2012), the First International Conference of Biology of Catalonia (CIBICAT) was held in Barcelona from July 9 to 12, 2012. Under the motto 'Global questions on advanced biology', the Conference was an excellent opportunity to discuss the current frontiers—if any—in the biological sciences, and the new challenges in this domain following the conceptual and technological revolution of the last few decades.

Since the different disciplines in the life sciences have definitely crossed their boundaries, specialization is no longer a hallmark of researchers involved in them. All biological disciplines have benefited from the multidisciplinary character of new techniques, and new research fields have emerged. The CIBICAT aimed at promoting interactions among the many disciplines in the life sciences and providing new insights into the most relevant emergent issues through different and sometimes opposite or contrasting points of view. At the CIBICAT, current advances in biology and biomedicine achieved in our country were presented. It was also a meeting place for scientists working on the life sciences around the world, who presented us the big questions that lie ahead in the field of biological. There we could reflect on the society's challenges to which biologists dedicate their efforts as researchers. We asked

renowned scientists to think about these issues and make a practice of critical thinking about the present and the future of biology from the boldest possible perspective.

With that Conference, the SCB celebrated hundred years of efforts of many colleagues that have worked for the advancement of our understanding of life and living organisms, of ecosystems, of health, and that have also contributed to the training and disseminating of biology. The CIBICAT aimed to be an exercise of reflection on the current frontiers of biology and the new challenges of the field. The Conference especially encouraged the participation of young researchers by offering them a framework where they could show the results of their research and discuss them with internationally renowned scientists. In addition, the conference aimed at discussing the most challenging topics in biology at present.

In the following pages, the structure and development of the meeting, plus three of the main lectures, are presented. The Conference was one of the many activities of the commemoration of the SCB's centennial and an excellent opportunity to disseminate around the world two major objectives of our Society: working to enhance biological sciences and promoting among young scientists their dedication and love for that exciting, fascinating field of science and human culture which is BIOLOGY. ■



The CIBICAT was held in several venues of Barcelona, mainly at the Ceremonial Hall of the University of Barcelona (left), and at the Institute for Catalan Studies (right), from 9 until 12 July, 2012.

# CIBICAT

## First International Conference of Biology of Catalonia

9TH – 12TH OF JULY 2012, BARCELONA

Global Questions on Advanced Biology Conference. An international conference on interdisciplinary frontiers in biology as part of the first Centenary of the Catalan Society for Biology (1912–2012)

### ORGANIZING COMMITTEE

- Lluís Tort, Autonomous University of Barcelona; President, Catalan Society for Biology
- Albert Sorribas, Vicerector for Scientific and Technology Policies, University of Lleida
- Albert Jordan, Molecular Biology Institute of Barcelona (IBMB-CSIC)
- Josep Saura, University of Barcelona
- Josep M. Canals, University of Barcelona
- Pepi Sabrià, Autonomous University of Barcelona
- Nuria Casals, International University of Catalonia
- Josep Maria Espelta, Centre for Ecological research and Forestry Applications (CREAF), Autonomous University of Barcelona

### SCIENTIFIC COMMITTEE

- Mercè Berlanga, University of Barcelona
- Mario Cáceres, Catalan Institution for Research and Advanced Studies (ICREA) and Autonomous University of Barcelona
- Josep M. Canals, University of Barcelona
- Gabriel Capellà, Bellvitge Biomedical Research Institute (IDIBELL)
- Josep M. Espelta, Autonomous University of Barcelona
- Jordi Garcia, University of Barcelona
- Pere Garriga, UPC - BarcelonaTech
- Albert Jordan, Molecular Biology Institute of Barcelona (IBMB-CSIC)
- Miguel Angel Martínez, Fundació IrsiCaixa
- Ramon Massana, Institute of Marine Science (ICM-CSIC)
- Montserrat Papaceit, University of Barcelona
- Josep Planas, University of Barcelona
- Enric Ribes, University of Barcelona
- Pepi Sabrià, Autonomous University of Barcelona
- Josep Saura, University of Barcelona
- Albert Sorribas, University of Lleida
- Francesc Viñals, Catalan Institute of Oncology and University of Barcelona

### COMMITTEE COORDINATOR

Josep Clotet, International University of Catalonia; General Secretary, Catalan Society for Biology



### PROGRAMME

#### Chromatin and epigenetics, genomics and proteomics, molecular biology, molecular biology of cancer, and reproductive biology

#### INAUGURAL PLENARY LECTURE

##### Epigenetics: from biology to disease

Manel Esteller, Bellvitge Biomedical Research Institute (IDIBELL), Barcelona

#### PARALLEL SESSIONS

##### EPIGENETIC MECHANISMS IN HEALTH AND DISEASE

Coordinator: Albert Jordan, Molecular Biology Institute of Barcelona (IBMB-CSIC)

Moderator: Marian Martínez-Balbas, Molecular Biology Institute of Barcelona (IBMB-CSIC)

##### Diabetes and the genomic dark matter of pancreatic beta cells

Jorge Ferrer, University of Barcelona, August Pi i Sunyer Biomedical Research Institute (IDIBAPS)

##### Overcoming the epigenetic barrier during reprogramming to pluripotency

María José Barrero Núñez, Center of Regenerative Medicine in Barcelona (CMRB)

##### Linking ZRF1 with retinoic acid pathway in the regulation of transcription and differentiation of leukemic cells

Santiago Demajo Meseguer, Centre for Genomic Regulation (CRG)

##### MacroH2A1 in myogenic differentiation and muscle regeneration – an interplay of metabolism and epigenetics

Melanjia Posavec, Institute of Predictive and Personalized Medicine of Cancer (IMPPC)

##### The histone demethylase PHF8 is essential for cytoskeleton dynamics

Elena Asensio Juan, Molecular Biology Institute of Barcelona (IBMB-CSIC)

##### Snail1 regulates heterochromatin transcription

Alba Millanes Romero, Hospital del Mar Medical Research Institute (IMIM)

##### Proteomic distribution in the human sperm chromatin

Judit Castillo Corullón, University of Barcelona

#### BIOMEDICAL PROTEOMICS AND TRANSCRIPTOMICS

Coordinator: Mario Cáceres, Catalan Institution for Research and Advanced Studies (ICREA) and Autonomous University of Barcelona

Moderator: Francesc Xavier Avilés, Autonomous University of Barcelona

##### High-throughput biomedical transcriptomics and proteomics: their relevance in the health system

Jaume Reventós, Vall d'Hebron Research Institute and Hospital (IRVH), Barcelona

##### The proteome of isolated human sperm tail suggests new metabolic pathways

Alexandra Amaral, University of Barcelona

##### Urine proteomic analysis for the identification of prostate cancer biomarkers

Marina Rigau, Vall d'Hebron Research Institute and Hospital (IRVH), Barcelona

##### Differential RNAs in the sperm cells of asthenozoospermic patients.

Meritxell Jodar Bifet, University of Barcelona

##### miRNA profile in “elite controllers”: a pilot study

Mireia Arnedo, August Pi i Sunyer Biomedical Research Institute (IDIBAPS)

##### Mitochondrial DNA expression and content in postmortem brain tissue of schizophrenia patients and control subjects

Helena Torrell Galceran, University Rovira i Virgili, Tarragona

##### Molecular diagnosis of glioblastoma based on discriminant equations: objective recognition of primary and secondary cases

Xavier Castells, Autonomous University of Barcelona

## GAMETES, STEM CELLS AND DIFFERENTIATION

Coordinator: Enric Ribes, University of Barcelona

Moderators: Mercè Durfort, University of Barcelona; Francesca Vidal, Autonomous University of Barcelona

**Reprogramming the potency of somatic cells: how and what for?**

Angel Raya, Institute for Bioengineering of Catalonia (IBEC)

**Chromosome size and morphology determine bivalent positioning in human spermatocytes**

Laia Vergés, Autonomous University of Barcelona

**Aneuploid and diploid spermatozoa from reciprocal translocation carriers exhibit an altered segregation pattern**

Anna Godo, Autonomous University of Barcelona

**Treatment of mouse somatic cell nuclear transfer embryos with psammalin A improves *in vitro* development and quality.**

Anna Mallol, Autonomous University of Barcelona

**Complete meiosis from human induced pluripotent stem cells**

Cristina Eguizabal, Center of Regenerative Medicine in Barcelona (CMRB)

**The influence of E-cadherin on embryonic stem cell derivation from mammalian isolated blastomeres**

Josep Santaló, Autonomous University of Barcelona

## COMPUTATIONAL AND STRUCTURAL BIOLOGY

Coordinator: Mario Cáceres, Catalan Institution for Research and Advanced Studies (ICREA) and Autonomous University of Barcelona

Moderator: Roderic Guigó, Centre for Genomic Regulation (CRG), Barcelona

**In silico biology**

Modesto Orozco, University of Barcelona, Institute for Research in Biomedicine (IRB)

**The role of structural disorder in the rewiring of protein interactions through evolution**

Roberto Mosca, University of Barcelona, Institute for Research in Biomedicine (IRB)

**IntOGen: Large scale analysis and integration of cancer genomics data**

David Tamborero, Pompeu Fabra University

**Alternative splicing and stochastic gene expression**

Xavier De La Cruz, Molecular Biology Institute of Barcelona (IBMB-CSIC)

**Mapping the dark side of the human genome: long non-coding RNAs**

Rory Johnson, Centre for Genomic Regulation (CRG), Barcelona

**Somatic structural mosaicism as an early genetic marker of late-onset diseases**

Juan R González, Centre for Research in Environmental Epidemiology (CREAL)

**Accurate prediction of inversions in the human genome from paired-end mapping data with the GRIAL algorithm**

Alexander Martinez Fundichely, Autonomous University of Barcelona

## REGULATION OF CHROMATIN FUNCTIONS

Coordinator: Albert Jordan, Molecular Biology Institute of Barcelona (IBMB-CSIC)

Moderator: Marcus Buschbeck, Institute of Predictive and Personalized Medicine of Cancer (IMPPC), Badalona

**Dealing with chromatin constrains in gene regulation**

Miguel Beato, Centre for Genomic Regulation (CRG), Barcelona

**Epigenetic regulation of centromere function**

Olga Moreno, Molecular Biology Institute of Barcelona (IBMB-CSIC)

**The MyoD-BAF60c complex poises chromatin for rapid transcription**

Sònia Forcales, Institute of Predictive and Personalized Medicine of Cancer (IMPPC), Badalona

**SIRT2 regulates genomic stability and cell cycle progression through the control of H4K16Ac and H4K20me1 levels**

Paloma Martínez, Bellvitge Biomedical Research Institute (IDIBELL)

**Human histone H1 variants: knock-down and occupancy in the genome**

Lluís Millán Ariño, Molecular Biology Institute of Barcelona (IBMB-CSIC)

**Contribution of hydrophobic interactions to the folding and fibrillation of the C-terminal domain of histone H1**

Alicia Roque, Autonomous University of Barcelona

## GENES AND GENOMES

Coordinator: Mario Cáceres, Catalan Institution for Research and Advanced Studies (ICREA) and Autonomous University of Barcelona

Moderator: Xavier Estivill, Centre for Genomic Regulation (CRG), Barcelona

**The mutational landscape of chronic lymphocytic leukemia**

Elias Campo, University Hospital Clinic, Barcelona

**When nature decides: one gene, two DNA repair pathways and three human diseases**

Jordi Surrallés, Autonomous University of Barcelona

**Molecular diagnosis of rare Mendelian diseases using whole exome sequencing**

Benjamin Rodríguez-Santiago, Quantitative Genomic Medicine Laboratories S.L

**The *PLAU* P141L single nucleotide polymorphism is a potential genetic predictor of the arteriogenic response in coronary artery disease**

Joan Duran, University of Barcelona

**Study of genetic association in 1q21-23 locus, a candidate region for psychosis**

Marta De Castro i Català, University of Barcelona

**Large-scale validation and genotyping of inversions in the human genome by inverse PCR**

Cristina Aguado Esteban, Autonomous University of Barcelona

## BIOLOGY OF REPRODUCTION

Coordinator: Enric Ribes, University of Barcelona

Moderators: Joaquina Navarro, Autonomous University of Barcelona; Rafael Oliva, August Pi i Sunyer Biomedical Research Institute (IDIBAPS), University of Barcelona

**Current knowledge of the proteomics of human spermatozoa**

Rafael Oliva, University of Barcelona

**Gonadal transcriptome analysis of the effects of temperature on European seabass (*Dicentrarchus labrax*) sex ratios**

Noelia Díaz, Spanish National Research Council (CSIC)

**Sperm nucleoprotein structure is more resistant to sustain cryopreservation procedures in good than in poor freezability boar ejaculates**

Efren Estrada, Autonomous University of Barcelona

**An assessment of telomeric repeat-containing RNA (TERRA) and telomerase in human fetal oocytes**

Rita Reig-Viader, Autonomous University of Barcelona

**Comprehensive analysis of sperm DNA fragmentation through alkaline and neutral Comet assay in clinical groups of infertile patients**

Jordi Ribas-Maynou, Autonomous University of Barcelona

**Evidences that ATR is involved in DSB repair during meiotic prophase**

Sarai Pacheco, Autonomous University of Barcelona

## PROLIFERATION, ANGIOGENESIS AND METASTASIS

Coordinator and moderator: Gabriel Capellà, Catalan Institute of Oncology (ICO)

**Mechanism of resistance to anti-angiogenic therapies**

Oriol Casanovas, Bellvitge Biomedical Research Institute (IDIBELL)

**Identification of Sp1 targets involved in proliferation and cancer**

Veronica Noé, University of Barcelona

**Characterization of prostate cancer bone metastasis process by a highly bone metastatic cell line generated *in vivo***

Marta Garcia, Vall d'Hebron Research Institute and Hospital (IRVH), Barcelona

**Cancer and arsenic: dedifferentiation and effects on CSCs**

Anna Pastoret, Autonomous University of Barcelona

**Role of MSK1 in steroid hormone-induced breast cancer cell proliferation**

Diana Reyes Garau, Centre for Genomic Regulation (CRG), Barcelona

**PFKFB3 regulation by p38 MAPK pathway**

Laura Novellasedemunt Vilaseca, University of Barcelona

## ROUND TABLE

**Frontiers of biology: 10 years after the human genome sequencing**

Xavier Estivill, Centre for Genomic Regulation (CRG), Barcelona; Manel Esteller, Bellvitge Biomedical Research Institute (IDIBELL), Barcelona; Manuel Peruchó, Institute of Predictive and Personalized Medicine of Cancer (IMPPC), Badalona; Ivo Gut, National Center for Genome Analysis (CNAG), Barcelona

## Biophysics, molecular biology and systems biology, and neurobiology

### PLENARY LECTURE

#### The evolution of language

Tekumseh Fitch, University of Vienna, Vienna

### PARALLEL SESSIONS

#### CELL DAMAGE AND CELL DEATH

Coordinator: Josep Saura, University of Barcelona

Moderator: Josefa Sabrià, Autonomous University of Barcelona

**Age-dependent decline of motor cortex but not hippocampal performance in heterozygous BDNF mice correlates with a decrease of cortical PSD-95 but an increase of hippocampal TrkB levels**

Albert Giralt, University of Barcelona

**Decreased PKC-delta protein levels as a neuroprotective mechanism in cells expressing mutant huntingtin**

Laura Rué, University of Barcelona

**Phenotypic and functional characterization of antigen-specific myeloid-derived suppressor cells generated during retroviral transduction of murine bone marrow**

Sílvia Casacuberta Serra, Vall d'Hebron Research Institute and Hospital (IRVH)

**Unique role of Bcl-xL regulating the antiapoptotic role of NF-kB**

Elisenda Casanelles Abella, Autonomous University of Barcelona

**Role of CDK11 in the  $\beta$  cell mass apoptosis in type I diabetes**

Ester Sala Soler, University of Lleida

**Failure of caspase-dependent cell death to reach the classical apoptotic phenotype in SH-SY5Y human neuroblastoma derived cells**

Mercè Garcia i Belinçhón, Autonomous University of Barcelona

**Development of a network to provide fresh human tissue for research**

Estephan Arredondo, Barcelona Science Park (PCB)

**Mitochondrial toxicity of carbon monoxide from tobacco in smoking pregnant women: reduced intrauterine growth**

Marc Catalán, University of Barcelona, University Hospital Clínic, August Pi i Sunyer Biomedical Research Institute (IDIBAPS), Centre for Biomedical Network Research on Rare Diseases (CIBERER)

#### FROM GENOTYPE TO PHENOTYPE: WHERE ARE WE NOW?

Coordinator and moderator: Albert Sorribas, University of Lleida

##### Scientific challenges in systems biology

Luis Serrano, Centre for Genomic Regulation (CRG), Barcelona

##### DEBATE: FROM GENOTYPE TO PHENOTYPE

##### RNA as a first phenotype (molecular) of a cell

Roderic Guigó, Centre for Genomic Regulation (CRG), Barcelona

##### Complex biological networks: challenges and opportunities

Ricard Solé, Pompeu Fabra University, Barcelona; Roger Guimerà, University Rovira i Virgili, Tarragona

##### Metabolic networks and the evolution of metabolism

Juli Peretó, University of Valencia

#### TRAFFIC AND SIGNALING IN HEALTH AND DISEASE

Coordinator: Francesc Viñals, Catalan Institute of Oncology and University of Barcelona

Moderator: Víctor J. Yuste, Autonomous University of Barcelona

**Biogenesis of carriers for secreting bulky cargoes and proteins that cannot enter the endoplasmic reticulum**

Vivek Malhotra, Centre for Genomic Regulation (CRG), Barcelona

**Apoptosis, immunogenicity and stability properties of PPRHs directed against survivin in mammalian cancer cell lines**

Laura Rodriguez, University of Barcelona

**Contribution of rare and common variants of *PTCH1* gene in autism**

Bàrbara Torricó Avilés, University of Barcelona

**Mitochondrial implication in adverse outcomes of HIV pregnancies**

Glòria Garrabou Tornos, University of Barcelona, University Hospital Clínic,

August Pi i Sunyer Biomedical Research Institute (IDIBAPS), Centre for Biomedical Network Research on Rare Diseases (CIBERER)

#### Gene therapy for diabetes: moving to clinic?

David Callejas Castiñeiras, Autonomous University of Barcelona

#### Mitochondrial implication in sepsis

Ester Tobias, August Pi i Sunyer Biomedical Research Institute (IDIBAPS), University of Barcelona, University Hospital Clínic, Centre for Biomedical Network Research on Rare Diseases (CIBERER)

**El rol del gen *CNR1* (receptor cannabinoide tipus I) en la resposta clínica i la remissió al tractament amb citalopram (ISRS) en depressió major: estudi de seguiment a 12 setmanes**

Marina Mitjans, University of Barcelona

#### RECEPTORS, CHANNELS AND TRANSPORTERS

Coordinator: Pere Garriga, Technical University of Catalonia (UPC) - BarcelonaTech

Moderator: Francesc Sepulcre Sánchez, UPC - BarcelonaTech

##### New paradigms in GPCR signaling: G proteins at the mitochondria

Anna Aragay, Molecular Biology Institute of Barcelona (IBMB-CSIC)

**Molecular details of the apolipoprotein E and the amyloid beta peptide interaction: Analysis of a potential binding site responsible for ApoE4 misfolding**

Alex Perálvarez-Marín, Autonomous University of Barcelona

**In Silico analysis of neurokinin-1 at the sequence level: a preface to structural studies**

Danial Afsharzadeh, UPC - BarcelonaTech

**The voltage-dependent K<sup>+</sup> channel Kv1.3 in adipocytes**

Mireia Pérez Verdaguer, University of Barcelona

**Assessment of the conformation profile of bombesin, neuromedin B and neuromedin C by computational methods**

Juan Jesús Pérez González, UPC - BarcelonaTech

**Visual phototransduction: from rhodopsin and cone opsin mutations to visual disease**

Eva Ramon Portés, UPC - BarcelonaTech

**The voltage-dependent K<sup>+</sup> channel Kv1.5 in B lymphocytes**

Albert Vallejo, University of Barcelona

#### CELLULAR AND MOLECULAR NEUROBIOLOGY

Coordinator: Josep Saura, University of Barcelona

Moderator: Teresa Vilaró, Institute of Biomedical Research of Barcelona (IIBB), August Pi i Sunyer Biomedical Research Institute (IDIBAPS), Centers for Networked Biomedical Research (CIBERNED)

**Normalization of P75 levels prevents cognitive decline in a knock-in mouse model of Huntington disease**

Veronica Brito, University of Barcelona

**Oxygen tension modulates glial cell lineage commitment through modifications on *bmp7* expression**

Juan Alberto Ortega Cano, University of Barcelona

**Activity-dependent gene transcription and memory in Alzheimer's disease**

Carlos Saura, Autonomous University of Barcelona

**Disrupció de les oscil·lacions corticals de baixa freqüència per fenciclidina: un model vàlid per al cribatge de nous fàrmacs antipsicòtics**

Eva Troyano Rodríguez, Institute of Biomedical Research of Barcelona (IIBB)

**Neurophysiological alterations in a mouse model of proliferative retinopathy**

Pilar Villacampa Alcubierre, Autonomous University of Barcelona

**SC-51089 chronic treatment decreases motor and cognitive deficits in mouse model of huntington's disease**

Marta Anglada Huguet, University of Barcelona

**Parkin loss of function leads to RTP801 accumulation and neurodegeneration in parkinson's disease**

Joan Romani Aumedes, University of Barcelona

**Effect of acute exposure to cocaine in a dopaminergic neuronal model: a gene expression study**

Noèlia Fernández Castillo, University of Barcelona



## SYSTEMS BIOLOGY

Coordinator and moderator: Albert Sorribas, University of Lleida

### Organization Principles in Biology

Rui Alves, University of Lleida

### Boundary formation in cell populations: From gene regulation to tissue mechanics

Javier Buceta, Barcelona Scientific Park (PCB), University of Barcelona

### Integration of proteomic and genome-wide data to understand Polycomb function on mouse embryonic stem cells differentiation

Luciano di Croce, Centre for Genomic Regulation (CRG), Barcelona

### Ligand expression ahead of neurogenic wavefronts: a new design principle?

Marta Ibañes, University of Barcelona

### Defining the DNA interactome in a minimal bacteria

Eva Yús, Centre for Genomic Regulation (CRG), Barcelona

### Precision of the quorum sensing switch: Stochastic and non-equilibrium effects

Marc Weber, Barcelona Scientific Park (PCB)

### Using systems biology to learn about the synapse role in neurologic and psychiatric disorders

Àlex Bayés, Sant Pau Biomedical Research Institute (IIB Sant Pau)

## MOLECULAR BIOLOGY IN MODEL ORGANISMS

Coordinator: Albert Jordan, Molecular Biology Institute of Barcelona (IBMB-CSIC)

Moderator: Carles Ciudad, University of Barcelona

### Models diversos en genètica molecular de plantes: *Arabidopsis thaliana*, blat de moro, meló.

Pere Puigdomènech, Center of Research in Agricultural Genomics (CRAG, CSIC-IRTA-UAB-UB), Bellaterra

### Dma1: E3 ligase cell cycle regulated?

Natalia Ricco Pacheco, International University of Catalonia (UIC)

### Protection of diet-induced obesity and insulin resistance in transgenic mice overexpressing HMGA1 in adipose tissue

Efrén Riu, Center of Animal Biotechnology and Gene Therapy (CBATEG), Bellaterra

### Deficiency of cyclin D3 contributes to the apoptosis of beta cell and development of type 1 diabetes in nod mice

Alejandra Saavedra Avila, University of Lleida

### Hematopoietic stem cell gene therapy corrects biochemical imbalances in a murine model of MNGIE

Javier Torres-Torronteras, Vall d'Hebron Research Institute and Hospital (IRVH), Barcelona

### AAV9-sulfamidase vector delivery to the cerebrospinal fluid corrects BRAIN and somatic pathology in MPSIIIA mice and results in detectable enzyme levels in dogs

Virginia Haurigot, Center of Animal Biotechnology and Gene Therapy (CBATEG), Bellaterra

## BIOPHYSICS

Coordinator: Pere Garriga, Technical University of Catalonia (UPC)-BarcelonaTech

Moderator: Esteve Padrós Morell, Autonomous University of Barcelona

### Mechanobiology of lung cells

Daniel Navajas, University of Barcelona

### Direct observation of stalled fork restart and lesion bypass via fork regression in T4 replication system

Maria Manosas, University of Barcelona

### Probing G-protein-coupled receptor dimerization and its role in depression

Mercè Tena Campos, UPC - BarcelonaTech

### Unraveling nucleic acids and proteins using single molecule methods

Felix Ritort, University of Barcelona

### UB behaviour in biomimetic membranes of DPPC and MGDG

Javier Hoyo, UPC - BarcelonaTech

### Biochemical changes in a rat model of stroke assessed by in vivo magnetic resonance spectroscopy (MRS) and ex vivo high resolution magic-angle spinning (HRMAS)

Myriam Davila, Autonomous University of Barcelona

### Structural and biochemical insights into the human mitochondrial transcription factor A with the light strand promoter

Anna Rubio Cosials, Molecular Biology Institute of Barcelona (IBMB-CSIC)

## ROUND TABLE

### Following the track of DNA: from crime to evolution

Jose A. Lorente, University of Granada; Assumpció Malgosa, Autonomous University of Barcelona; Tomàs Marqués, Institute of Evolutionary Biology (IBE, CSIC-UPF), Barcelona; Alicia Bofarull, National Institute of Toxicology and Forensic Sciences, Barcelona; Andrés Moya, University of Valencia

## Cell signaling, developmental biology, evolvative biology, and neurobiology

### PLENARY LECTURE

#### Huntingtin from evolution to pathology via the embryonic stem cells

Elena Cattaneo, University of Milan, Italy

### PARALLEL SESSIONS

#### CELL SIGNALLING IN THE NERVOUS SYSTEM

Coordinator and moderator: Francesc Viñals, Catalan Institute of Oncology and University of Barcelona

#### Role of hippocampal nNOS/cGMP pathway in cognitive impairment in Huntington's disease

Ana Saavedra, University of Barcelona

#### Cox-2 regulation by IL-1 $\beta$ through MAPKs: A comparison of nasal mucosa and nasal polyps fibroblasts from AIA patients

Francesc Josep Garcia i Garcia, August Pi i Sunyer Biomedical Research Institute (IDIBAPS)

#### The role of PDK1 beyond PKB/AKT in regulating neuronal survival analysed by knock-in mutation

Jose R. Bayascas, Autonomous University of Barcelona

#### A circadian controlled G-protein coupled receptor heterodimer modulates melatonin production

Peter McCormick, University of Barcelona

#### A functional A2RE sequence is responsible for transport of the DDR1 mRNA to oligodendrocyte processes

Nerea Abasolo Zabalo, University Rovira i Virgili, Tarragona

#### Hypothalamic ceramide levels regulated by cpt1c are involved in orexigenic effects of ghrelin

Sara Ramírez Flores, International University of Catalonia (UIC)

#### A potential role of Kalirin-7 in cortico-striatal learning deficits in HD

Mar Puigdemívol Cañadell, University of Barcelona

#### The persistence of memory: Two-photon imaging reveals how synapses learn and remember in real time

Miquel Bosch, Massachusetts Institute of Technology (MIT)

## EVOLUTION

Coordinator and moderator: Montserrat Papaceit, University of Barcelona

#### Genomic shuffling affects recombination rates during mammalian diversification

Aurora Ruiz-Herrera, Autonomous University of Barcelona

#### Evolution of recent rodent gene duplicates

Cinta Pegueroles, Hospital del Mar Medical Research Institute (IMIM)

#### Biosphere's phylogenetic structure

Cristian R. Altaba, University of the Balearic Islands

#### Origen i evolució del sistema quimiosensorial i desenvolupament de nous marcadors moleculars en aràcnids

Cristina Frias, University of Barcelona

#### EBV strain variation in different lymphoblastoid cell lines derived from 1000 Genomes Project individuals

Gabriel Santpere, Institute of Evolutionary Biology (IBE, CSIC-UPF), Barcelona

#### Identification of selective sweeps in the genome of the Boxer breed

Javier Quilez Oliete, Center of Research in Agricultural Genomics (CRAG, CSIC-IRTA-UAB-UB), Bellaterra

**Molecular analysis of the mechanisms involved in THBS4 differential gene-expression in the human brain**

Raquel Rubio Acero, Autonomous University of Barcelona

**Two new plant cytogetic online resources: the GSAD and Plant rDNA databases**

Sònia Garcia, University of Barcelona

**DEVELOPMENT**

Coordinator and moderator: Jordi Garcia, University of Barcelona

**Gene loss impact on evo–devo: Dismantling the retinoic acid Pathway in the chordate *Oikopleura dioica***

Cristian Cañestro, University of Barcelona

**Helios, a new transcription factor involved in the determination of striatal medium spiny neurons**

Mònica Pardo Muñoz, University of Barcelona

**Evolutionary conserved role of the beta-catenin/Wnt signalling throughout planarian life cycle**

Teresa Adell, University of Barcelona

**Functional characterization of neoblast specific transcription factors during planarian regeneration**

Alejandro González-Sastre, Institute of Biomedicine (IBUB-UB), Barcelona

**The role of the microRNA trio let-7, miR-100 and miR-125 in insect hemimetabolous metamorphosis**

Mercedes Rubio, Institute of Evolutionary Biology (IBE, CSIC-UPF), Barcelona

**Ovarian follicle development in primitive insects**

Paula Irlles, Institute of Evolutionary Biology (IBE, CSIC-UPF), Barcelona

**Regeneration in *Isodiametra pulchra* (Acoela, Acoelomorpha)**

Elena Perea Atienza, University of Barcelona

**How often does natural selection targets multiple, interacting genes?****The prevalence of epistasis in recent human evolution**

Natalia Petit, Institute of Evolutionary Biology (IBE, CSIC-UPF), Barcelona

**EVOLUTION AND DEVELOPMENT IN THE NERVOUS SYSTEM**

Coordinator: Josep M. Canals, University of Barcelona

**20 years of epithelial to mesenchymal transition**

Angela Nieto, Institute of Neuroscience (IN, CSIC-UMH), Alacant

**No place like home: stem cells and the neurovascular niche**

Isabel Fariñas, University of Valencia

**The regulation of neural stem and progenitor cell fate by the activity of transcription factors**

Carlos Vicario-Abejon, Cajal Institute (CSIC), Madrid

**An evo-devo approach for understanding the amygdala, a key forebrain center for control of emotions and social behavior**

Loreta Medina, Institute for Research in Biomedicine (IRB), Barcelona

**Aquaculture, ecology, microbiology, and virology****PLENARY LECTURES**

(co-organized with the SCB Sections of Ecology, Microbiology and Virology)

**The origins of AIDS virus**

Miguel A. Martínez, IrsiCaixa

**Symbiotic planet**

Ricard Guerrero, Institute for Catalan Studies (IEC) and University of Barcelona

**Epigenetics in ecological research and animal production**

Francesc Piferrer, Institute of Marine Science (ICM-CSIC), Barcelona

**VIROLOGY**

Coordinator: Miguel Angel Martínez, Fundació IrsiCaixa

**Presentation**

Miguel Angel Martínez, coordinator of the SCB Virology section

**Quasispecies dynamics and the control of viral infections**

Ester Domingo, Severo Ochoa Molecular Biology Centre (CBMSO), Madrid

**Deep sequencing of naturally evolving arbovirus populations in the mosquito vector identifies new variants with epidemic potential**

Marco Vignuzzi, Institut Pasteur, Paris

**Archaeology of RNA applied to the study of hepatitis C virus**

Jordi Gomez, Institute of Parasitology and Biomedicine “López-Neyra” (IPBLN), Granada

**Hepatitis A virus, a very special picornavirus**

Albert Bosch, University of Barcelona

**Norovirus diversity in relation to population impact**

Marion Koopmans, National Institute for Public Health and the Environment (RIVM), Bilthoven; Erasmus Medical Center, Rotterdam

**Evolution of HIV-1 protease over 14 years: fitness loss or robustness gain**

Elena Capel, Glòria Martrus, Mariona Parera, Bonaventura Clotet, Miguel Angel Martínez

**Antiretroviral agents effectively block HIV replication after cell to cell transfer**

Marc Permanyer, Ester Ballana, Alba Ruiz, Roger Badia, Eva Riveira, Bonaventura Clotet, José A. Esté

**HIV maturation: a new RNA-supported paradigm of spatiotemporal nucleoprotein remodeling catalysed by a protease**

Sébastien Lyonnais, Robert J. Gorelick, Carine Tisné, Jean Christophe Paillart, Laure Dufau, Michele Reboud, Sara Nieto, Tuixent Escriba, Jose Maria Gatell, Gilles Mirambeau

**Transmissibility of two ipomoviruses by whitefly vectors under experimental conditions**

Lluïsa Vilaplana, M. Urizarna, A. Mingot, J. J. López-Moya

**The Movement Protein of *Cucumber mosaic virus* (CMV) determines the virulence in the melon accession PI161375**

Cèlia Guiu, Juan A. Díaz-Pendón, Ana Montserrat Martín-Hernández

**Changes in the evolution of sexually transmitted pathogens. From direct examination to molecular biology**

Martí Vall Mayans

**Study of hepatitis C virus infection by using a *Gaussia luciferase* cell-based system**

George Koutsoudakis, Sofia Pérez del Pulgar, Patricia González, Gonzalo Crespo, Miguel Navasa, Xavier Fornes

**Characterization of UL8, a new member of the human cytomegalovirus RL11 multigene family**

Natalia Pérez-Carmona, Domènec Farré, Pablo Engel, Ana Angulo

**MICROBIOLOGY**

Coordinator: Mercè Berlanga, University of Barcelona

**Presentation**

Teresa Vinuesa, University of Barcelona and Montserrat Agut, Chemical Institute of Sarrià (IQS)

**Epigenetics and evolution in bacteria**

Miquel Viñas, University of Barcelona

**Bacterial athogenesis as an imperfect symbiosis**

Josep Casadesús, University of Seville

**Endosymbiosis and evolution**

Juli Peretó, University of Valencia

**Bioremediation and cooperation**

Balbina Nogales, University of the Balearic Islands

**Extremophile microorganisms and life beyond**

Ricard Amils, Autónoma University of Madrid

**The rare biosphere: the oldest cooperative in the world**

Carles Pedrós-Alió, Institute of Marine Science (ICM-CSIC), Barcelona

**ROUND-TABLE****The 21st century microbiologies: prospects for the future**

Coordinated by Isabel Esteve, Autonomous University of Barcelona

**ECOLOGY**

Coordinators: Josep M. Espelta, Autonomous University of Barcelona; Ramon Massana, Institute of Marine Science (ICM-CSIC)

**Stoichiometry and global metabolism**

Josep Peñuelas, Centre for Ecological research and Forestry Applications (CREAF-CSIC), Bellaterra

**Phylogenetics, genomics and global change: understanding the past to enlighten the future**

Vincent Savolainen, Imperial College, UK

**Biodiversity: portfolio of responses to global change**

Fernando Valladares, Centre of Environmental Sciences (CCMA-CSIC), Madrid

**Phytoplankton as victims and players in the global change**

Adriana Zingone, Anton Dohrn Zoological Station, Italy

**The threat of Earth's oceans becoming more acidic**

Carles Pelejero, Institute of Marine Science (ICM-CSIC), Barcelona

**Marine invasions: a future nuisance that is already present**

Enric Ballesteros, Centre for Advanced Studies of Blanes (CEAB-CSIC)

ROUND-TABLE

**Could global change finally merge terrestrial and aquatic ecologists?**

**AQUACULTURE**

Coordinator: Josep Planas, University of Barcelona

**CHALLENGES OF AQUACULTURE IN THE TWENTY-FIRST CENTURY**

**Aquaculture today, a look at challenges ahead: health management**

Dolors Furones, Institute of Agrifood Research and Technology (IRTA), Barcelona

**Molecular basis of the making of eggs in marine fish: the role of oocyte aquaporin**

Joan Cerdá, Institute of Agrifood Research and Technology (IRTA-CSIC), Barcelona

**Present and future of nutrition in fish. Applied use of biomarkers and interactive mathematical models with a high predictive value**

Jaime Pérez-Sánchez, Institute of Aquaculture "Torre de la Sal" (IATS-CSIC), Castelló

**Regulation of markers of lipid metabolism in fish**

Isabel Navarro, University of Barcelona

**Diseases in fish: what do we have to know and what can we learn?**

Francesc Padrós, Autonomous University of Barcelona

**The stress response in fish and the interaction between regulatory systems**

Lluís Tort, Autonomous University of Barcelona

CLOSING PLENARY LECTURE

(co-organized with the SCB Sections of Ecology, Microbiology and Virology)

**Mutualistic networks: the architecture of biodiversity**

Jordi Bascompte, Doñana Biological Station, CSIC

GENERAL ROUND TABLES

**Workshop on conference presentation skills**

Elinor Thompson, Barcelona Biomedical Research Park (PRBB)

**"So now you got your PhD, what's next ...?" A first-hand review on unexpected professional**

Organized by Luis Ruiz, Janus Developments SL.

Joan Roig Amorós, Institute for Research in Biomedicine (IRB); Raül Martín Ruiz, Ysios Capital; Ramon Bosser, Janus Developments SL; Cristina Malagelada, University of Barcelona; Clara Campàs, Advancell; Ana Kosoy, Janus Developments SL; Meritxell Genesca, Germans Trias i Pujol Health Sciences Research Institute, Badalona; Albert Pol, University of Barcelona; Montse Vendrell, Biocat; Ana Kosoy, Janus Developments SL

**Research in Catalonia: University or research institutes?**

Marta Aymerich, Head of Research and Innovation, Dept. of Health, Generalitat de Catalunya; Jordi Alberch, Vicerector of Reserca, University of Barcelona; Joan Comella, Director, Vall d'Hebron Research Institute and Hospital (IRVH), Barcelona; Ramon Gomis, Director, August Pi i Sunyer Biomedical Research Institute (IDIBAPS), Barcelona; Albert Sorribas, Vicerector of Research, University of Lleida



From top to bottom: (A) Left to right: Lluís Tort, President, SCB; Antoni Castellà, Secretary for Universities and Research of the Autonomous Governement of Catalonia; Salvador Giner, president, IEC, Maria Serrat, Director General of the Liceu Conservatory Foundation. (B) Hall of the Liceu Conservatory, Barcelona. (C) Manuel Esteller, invited lecturer.