



**XVII INTERNATIONAL
CONGRESS OF THE
SPANISH BIOPHYSICAL
SOCIETY**

PROGRAM



TUESDAY 27th

15:00–16:30 Plenary Session

15:00 Mercabarna Room
Opening Ceremony

15:30 Plenary Lecture
Chair: J. Pérez Gil

Shaping fluid lipid membranes with proteins and biological filaments
P. Bassereau

16:30–18:30 Parallel Sessions

Mercabarna Room

Session I: Receptors, Channels, and Transporters
Chairs: E. Errasti, A. Peralvarez Marín

- 16:30** Gating in β -barrel channels: understanding voltage-induced closure when a mobile sensor domain is absent
M. Queralto-Martin
- 17:00** Structural insights into the MFSD2A-mediated lysophospholipid uptake and its inhibition by syncytin-2
M. Martinez Molledo
- 17:30** Novel Cav2.1-modulators to treat Hemiplegic Migraine
M. Izquierdo Serra
- 17:45** A Lysine in transmembrane helix 5 is crucial for LAT Transporter closing of the cytoplasmic gate
J. Fort
- 18:00** Kv β 2.1 subunit targets the Plasma Membrane by S-palmitoylation
S. Cassinelli
- 18:15** Exploring Lipid Binding Sites on TRPVs using Coarse-Grained Molecular Dynamics Simulations
M. López-Martin
- 18:22** Semi-microscopic modeling of a tetrameric ion channel
L. Ramirez-Piscina

Graus Room

Session II: Biological physics
Chairs: B. Ibarra, F. Ritort

- 16:30** Cell fate patterning by a diffusion-driven switch
M. Ibañes Miguez
- 17:00** Supramolecular Assembly of Proteins in Health and Disease
H. Garcia-Seisdedos
- 17:30** Swarming bacteria undergo localized dynamic phase transition to form stress-induced biofilms
I. Grobas
- 17:50** Enthalpy and entropy of RNA-ion interactions
J. Aspas
- 18:10** Active liposomes
B. Borges Fernandes

19:00–20:30 Welcome Cocktail

WEDNESDAY 28th

09:00–11:00 Parallel Sessions

Mercabarna Room

Session IV: Cell and Tissue Biophysics

Chairs: L. Redondo, J. Alegre Cebollada

- 09:00** Nuclear shape plasticity and mechanotransduction
V. Ruprecht
- 09:30** Interaction and regulation in redox partner proteins and photosynthetic complexes
M. Giannotti
- 10:00** The scutoid is a novel cellular shape that allows efficient epithelia bending/folding
J. Buceta
- 10:20** Stochastic particle unbinding modulates growth dynamics and size of transcription factor condensates in living cells
J. Torreno
- 10:40** How mechanical stimuli regulate cardiomyocyte biology
M. R. Pricolo

Graus Room

Session III: Computational biophysics in health

Chairs: B. Eguzkitza, C. Prats

- 09:00** Systems Mechanobiology in Non-Communicable Diseases and Disorders
Jerome Noailly
- 09:30** Supercomputer-based Virtual Human Twins: the future of medicine NOW
M. Vázquez
- 10:00** An analysis of the Low-density lipoprotein receptor-related protein 1 structure and dynamics
G.M. Tuveri
- 10:20** Understanding the antibiotic efflux through the MacABTolC pump
S. Llabres
- 10:40** A Mathematical Analysis of SARS-CoV-2 Transmissibility in Europe: From Pre-Alpha Variants to Omicron Lineages
V. Lopes de Rioja

11:00–11:30 Coffee Break

11:30–13:00 Mercabarna Room Plenary Lecture

Chair: D. Laurents

Molecular mechanism underlying neurotransmitter release
J. Rizo Rey

12:30 Sponsor presentation

Abberior - Platinum Sponsor

13:00–14:30 Lunch

14:30–16:30 Poster session I

16:30–17:00 Coffee break

17:00–19:00 Parallel Sessions

Mercabarna Room

Session V: Protein Structure, Dynamics, and Function

*Chairs: D. Laurents,
A. López Cortajarena*

- 17:00** Crosstalk Mitochondria-Nucleus: Cytochrome c as a Pleiotropic Organellar Factor
I. Diaz-Moreno
- 17:30** De novo design of β -sheet protein scaffolds suitable for installing binding sites
E. Marcos
- 18:00** Kinetic stabilization of translation-repression condensates by a neuron-specific microexon
C. Garcia-Cabau
- 18:15** Structural basis for the assembly of single and double ring complexes in human mitochondrial Hsp60-Hsp10 chaperonin
I. Tascon
- 18:30** New pharmacological strategy for identifying allosteric inhibitors of zinc-dependent target proteins
A. Velazquez-Campoy
- 18:45** The self-association equilibrium of class A J-domain proteins DnaJ2 regulates its interaction with unfolded substrate proteins and with Hsc70
J. Cuéllar
- 18:53** Architecture of the ESCPE-1 membrane coat
E. Astorga

Graus Room

Session VI: Advanced Bioimaging

*Chairs: M. Garcia-Parajo,
J.M. Valpuesta*

- 17:00** Engineering fluorescence emission for enhanced super-resolution microscopy
S. Lévêque-Fort
- 17:30** Unravelling the structure of toxic protein aggregates in situ
R. Fernandez-Busnadiego
- 18:00** Avoiding photobleaching-induced artefacts in confocal and super-resolution STED microscopy
P. Caravilla
- 18:20** Super resolution microscopy to explore the structural dynamics that control exocytosis
M. Puig Tintó
- 18:40** Single particle tracking reveals the spatio-temporal dynamics of the DNA clamp protein PCNA during DNA replication
C. Knapp

19:00–21:00 Visit to the Castle

THURSDAY 29th

09:00–11:00 Parallel Sessions

Mercabarna Room

Session VII: Nucleic Acids and Supramolecular Complexes

Chairs: B. Ibarra, M. Mañosas

- 09:00** Random perturbation of nanoscale copying machines
M. Ribezzi
- 09:30** Human HELB remodels RPA-coated ssDNA during homologous recombination
S. Hormeño
- 10:00** Exploiting the fluctuations of deformed nucleic acids
J. Luengo-Márquez
- 10:20** Exploring the Conformational Dynamics of Influenza A Virus vRNP during Transcription using High-Speed Atomic Force Microscopy
R. Bocanegra
- 10:40** Single-Molecule Footprinting of Netropsin-DNA Binding
I. Pastor

Graus Room

Session VIII: Systems Biophysics

Chairs: J. Buceta, J. Garcia-Ojalvo

- 09:00** Unraveling small noncoding RNAs and their chromatin state in triple lineage differentiation
A. Alemany
- 09:35** A dynamical systems approach to design function of Gene Regulatory Networks
R. Perez-Carrasco
- 10:10** Structural changes in intracellular calcium handling in patients with AF determines the spatial distribution of calcium sparks in a model of human atrial myocytes
B. Echebarria
- 10:25** Efficient simulation of multicellular systems in Julia, and its application to the mechanochemical symmetry breaking in gastruloids
G. Torregrosa
- 10:40** Bacterial Filamentation: Spatiotemporal MinD Patterning and Mechanical Stress
M. Nadal

11:00–11:30 Coffee Break

11:30–13:00 Mercabarna Room Plenary Lecture *Chair: A. López Cortajarena*

Why does it have to be so complicated? Reconstructing bacterial cell division
P. Schwille

12:30 **Sponsor presentation**
ThermoFisher - Silver+ Sponsor

12:45 **Sponsor presentation**
TBC

12:55 **Sponsor presentation**
Hamamatsu - Bronze+ Sponsor

13:00–14:30 Lunch

14:30–16:30 Poster session II

16:30–17:00 Coffee break

17:00–19:00 **SBE Awards**
Chair: J.M. Valpuesta

Mercabarna Room

“Manuel Rico” - Bruker Prize

17:00 TBC
T. Giráldez Fernández

17:30 Watching protein machines at work: Molecular biophysics of double-strand DNA break repair.
F. Moreno-Herrero

“E. Pérez Payá” - sub40 Prize

18:00 TBC
M. Mompeán García

Antalgenics - sub33 Prize

18:25 TBC
S. Hernandez Mejías

18:40 The Hill function as the universal limit of sharpness of equilibrium input-output responses
R. Martínez Corral

19:00–19:30 **SBE Assembly**

21:00 **Social Dinner**
Casanova Beach Club

FRIDAY 30th

09:30–10:30 Plenary Session

Mercabarna Room

09:30 **Plenary Lecture**
Chair: J. Garcia-Ojalvo

Hydrodynamics of collective cell migration in epithelia
J. Casademunt

Coffee break

11:00–13:00 Parallel Sessions

Mercabarna Room

Session X: Membrane Structure and Function

Chairs: F. Campelo, A. Le Roux

- 11:00** Visualizing Membrane Remodeling with Fast-AFM Insights into Protein and Drug Actions
A. Colom
Sponsored by Lasing SA
- 11:30** Sensing their plasma membrane curvature allows migrating cells to circumvent obstacles
A. Diz-Muñoz
- 12:00** Photoswitchable helical peptides with light-controllable interface/-transmembrane topology in lipidic membranes
M. Gutiérrez-Salazar
- 12:20** Exploring the role of $\alpha 5 \beta 1$ glycosylations at the cellular and molecular level
S. Masó
- 12:40** Further insight into the effect of polymers in pulmonary surfactant structure and function
A. Collada

Graus Room

Session IX: Artificial Intelligence in Biophysics

Chairs: C. Manzo, R. Sala Llonch

- 11:00** Quantitative Microscopy with Deep Learning
G. Volpe
- 11:30** Epitope Propensity, Entropy and Tokenization Analysis to Construct Artificial Neoepitope Libraries
A. Manteca
- 11:50** Discovering dynamic laws from observations
M. Ruiz-Garcia
- 12:10** Dynamic virtual live/apoptotic/-dead cell assay using deep learning
C. Beck Adiels
- 12:30** MAGIK: Microscopic motion analysis through graph inductive knowledge
J. Pineda
- 12:40** Bringing microplankton into focus: Deep learning meets holographic microscopy
H. Bachimanchi
- 12:50** Automation of optical tweezers DNA pulling experiments through deep learning
M. Selin

13:00–14:30 Plenary Session

Mercabarna Room

13:00 SCB IX Biophysics Day - Closing Lecture

Chair: A. Peralvarez Marín

Transmembrane interactions: a matter of life or death
I. Mingarro

14:00 Awards & Concluding remarks

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