



ESAB 2024

EUROPEAN
SOUTH ATLANTIC
BIOPHYSICS
CONGRESS

SCIENTIFIC PROGRAM

Wednesday 5th June 2023

14:30 - 16:00 Plenary Session

Plenary Room

14:30 Opening Ceremony

15:00 Plenary Lecture

Chair: tbd

Plenary Speaker. *Functional insights from the visualization of large protein complexes regulating human gene expression, **Prof. Eva Nogales**, University of California Berkeley, USA*

16:00 - 16:30 Coffee break

16:30 - 18:30 Parallel Sessions

Plenary Room

Session I: Cell and tissue biophysics: *Mechanobiology, Single cell biophysics*, Room I

Chairs: Nuno Santos, Coralie Bompard

16:30 Invited speaker. *FRET as a tool to probe the nanoscale environment of membrane proteins, **Dr. Fabio Fernandes**, Assistant Professor, Institute for Bioengineering and biosciences (iBB) Instituto Superior Técnico, Universidade de Lisboa, Portugal*

17:00 Invited speaker. *Tissue flows and patterns during symmetry breaking of multicellular systems, **Dr. Pierre-François Lenne**, CNRS Research Director, Principal Investigator, Aix-Marseille University, France*

17:30 **Platinum Sponsor.** *Cell membrane and intracellular mechanics inside cells, tissues and living organisms using SENSOCELL optical tweezers and TimSOM Micro-rheology,* **Oriol Nos Aguilà**, Impetux Optics S.L., Spain

17:45 **Oral contribution.** *Unraveling native complexity: Single molecule characterization of perinatal titin by force spectroscopy of tissue-purified proteins,* **Inés Martínez-Martín**, Centro Nacional de Investigaciones Cardiovasculares (CNIC), Madrid, Spain (**Abstract #45**)

18:00 **Oral contribution.** *Exploring the role of $\alpha 5\beta 1$ glycosylations at the cellular and molecular level,* **S. Masó-Orriols**, University of Vic, Barcelona, Spain (**Abstract #103**)

18:15 **Flash Talk.** *Elucidating protein-protein interactions in the cardiac sarcomere,* **Navoneel Sen**, University of Oxford, United Kingdom (**Abstract #228**)

18:20 **Flash Talk.** *Two-layer elastic models for single-yeast compressibility with flat microlevers,* **F. Argoul**, Université de Bordeaux, Talence, France (**Abstract #149**)

18:25 **Flash Talk.** *Nanomechanics of cell-derived matrices in Collagen VI-related Congenital Muscular Dystrophies,* **Marina I. Giannotti**, IBEC, Barcelona, Spain (**Abstract #14**).

Parallel Session Room

Session II: Disordered proteins, Liquid-liquid Phase Separation and Aggregation, Room II

Chairs: Véronique Receveur, Nunilo Cremades

16:30 **Invited speaker.** *Kinetic stabilization of translation-repression condensates by a neuron-specific microexon,* **Dr. Xavier Salvatella**, ICREA Research Professor and Principal Investigator, Laboratory of Molecular Biophysics, Institute for Research in Biomedicine (IRB), Spain

17:00 **Invited speaker.** *Modulators of Tau aggregation* **Dr. Yann Fichou**, Institut Européen de Chimie et Biologie (IECB-CNRS), University of Bordeaux, France

17:30 **Joint partnership with the Biophysical Society of Argentina - Invited speaker.** *Unlocking the Parkinson's Puzzle: Oligomerization, Membrane-Curvature Sensitivity, and Phase Behavior of Alpha-Synuclein*, **Dra. María Soledad Celej**. President of the Biophysical Society of Argentina, Research Center in Biological Chemistry, CONICET-UNC, Córdoba, Argentina.

18:00 **Oral contribution.** *Biomolecular condensates interacting with membranes: wetting, remodelling and damage stabilization*, **Agustin Mangiarotti**, Max Planck Institute of Colloids and Interfaces, Potsdam, Germany (**Abstract #80**)

18:15 **Oral contribution.** *Disordered proteins interact with the chemical environment to tune their protective function during drying*, **Thomas Boothby**, Department of Molecular Biology, University of Wyoming, Laramie, WY, USA (**Abstract #71**)

18:30 **Oral contribution:** *Time-dependent Material Properties of Ageing Condensates through Multiscale Simulations*, **Jorge R. Espinosa**, Dept. of Physical-Chemistry, Universidad Complutense de Madrid, Spain (**Abstract #2**).

18:30-19:30 Poster Session I

18:30-19:30 Outreach event "Biophysics in the City" by Prof. Félix M Goñi, Sala Ruiz Balerdi, TABAKALERA.

19:30-20:30 Welcome cocktail

Thursday 6th June 2023

9:00 - 10:00 Plenary Session

Plenary Room

9:00 Plenary Lecture

Chair: tbd

Plenary speaker. *Engineering protein stability and solubility, from monomers to inclusion bodies, Prof. Elizabeth Meiering, University of Waterloo, President of the Protein Society, Canada*

10:00 - 10:30 Coffee break

10:30 - 12:30 Parallel Sessions

Plenary Room

Session III: Protein structure, integrative structural biology, dynamics and function

Chairs: Claudio Soares, Jose Maria Valpuesta

10:30 **Invited speaker.** *Where to start : the dynamic adventure of identifying start codons in mRNAs, Dr. Israel Fernández, Biofisika Institute (CSIC, UPV/EHU), Spain*

11:00 **Invited speaker.** *Exploring Ataxin-3 Pathogenic Aggregation with Supramolecular Inhibitors: Clues for SCA3 therapies, Dr. Sandra Ribeiro Macedo, IS3, Porto, Portugal*

11:30 **Platinum Sponsor.** *FIDA technology – Combining structural and functional information, Linda Juul, Marketing Manager, FidaBio, Denmark.*

11:45 **Flash Talk.** *The Pseudomonas aeruginosa effector Tse5 forms membrane pores disrupting the membrane potential of intoxicated*

bacteria, **David Albesa-Jové**, Instituto Biofisika, Leioa, Spain (**Abstract #4**).

11:50 **Flash Talk**. *ESV1 and LESV, two new non-enzymatic proteins involved in new stages in the biosynthesis of starch granules*, **Coralie Bompard**, Université de Lille, CNRS, Lille, France, (**Abstract #7**).

11:55 **Flash Talk**. *High resolution structure of a T=219 giant virus*, **Sara Otaegi-Ugartemendia**, Centro Nacional de Biotecnología (CNB-CSIC), Spain (**Abstract #20**)

12:00 **Flash Talk**. *How can protonation influence conformational switching: the curious mechanism of diphtheria toxin translocation (T-) domain*, **Nuno F. B. Oliveira**, Universidade de Lisboa, Portugal (**Abstract #28**)

12:05 **Flash Talk**. *Structural basis for functional complexes between heptameric GroEL chaperonin and tetrameric plastid Cpn20 cochaperonin*, **Alberto G. Berruezo**, Instituto Biofisika, Spain (**Abstract #31**)

12:10 **Flash Talk**. *A novel BioID strategy for in vivo detection of protein-protein interactions*, **Laura Sen-Martín**, Centro Nacional de Investigaciones Cardiovasculares Carlos III (CNIC), Spain (**Abstract #44**)

12:15 **Flash Talk**. *The genetic architecture of hydrophobic protein cores through deep sequence space*, **Albert Escobedo**, Centre for Genomic Regulation (CRG), Spain (**Abstract #191**)

12:20 **Flash Talk**. *Bag1 has a key role in the Hsp70-assisted, proteasome-mediated degradation pathway*, **Jorge Cuéllar**, Centro Nacional de Biotecnología (CNB-CSIC), Spain (**Abstract #192**)

12:25 **Flash Talk**. *Molecular mechanism of a bacterial Retron*, **Arturo Carabias**, Novo Nordisk Foundation Centre for Protein Research, University of Copenhagen, Denmark (**Abstract #209**).

Parallel Session Room

Session IV: Biophysics of Nucleic Acids

Chairs: Eric Ennifar, Fernando Moreno Herrero

10:30 **Invited speaker.** *Beyond the helix: probing the structure of supercoiled DNA using high-resolution atomic force microscopy, Dr. Alice Pyne*, University of Sheffield, UK.

11:00 **Invited speaker.** *Monitoring tRNA maturation and identifying modification circuits with NMR spectroscopy, Dr Pierre Barraud*, Institut de Biologie Physico-Chimique, (IBPC), CNRS-Université Paris Cité, France.

11:30 **Platinum Sponsor.** *Towards the real-time observation and manipulation of biological processes: from single molecule to whole cells, Dr. Vincenzo Mascoli*, LUMICS, The Netherlands

11:45 **Oral contribution.** *Exploring Long Non-Coding RNA secondary structures through AFM imaging, Eva M. Martín Cuevas*, Spanish National Center of Biotechnology (CNB-CSIC), Spain (**Abstract #187**)

12:00 **Oral contribution.** *Single molecule studies of the role of FBH1 in fork reversal. Javier Mendia-García*, Centro Nacional de Biotecnología (CNB), CSIC, Spain (**Abstract #171**)

12:15 **Flash Talk.** *Structure and dynamics of non-canonical DNA motifs, Carlos González*, Instituto de Química Física Blas Cabrera, CSIC, Spain (**Abstract #178**).

12:20 **Flash Talk.** *Characterization of the real-time kinetics of the activities of the human mitochondrial DNA helicase at the single-molecule level, Ismael Plaza*, Instituto Madrileño de Estudios Avanzados en Nanociencia, Spain (**Abstract #73**)

12:25 **Flash Talk.** *DNA curtains-based approach for fluorescence microscopy-correlated Optical Tweezers, Sara de Bragança*, Spanish National Center for Biotechnology (CNB), CSIC, Spain (**Abstract #148**)

12:30 - 13:30 Awards I (SBE Awards)

SBE Awards

- **Manuel Rico´-Bruker España Prize (30´)**: Title tbd, **Xavier Sabatella**, Institute for Research in Biomedicine (IRB), Spain
- **E.Pérez Payá-Prospera Biotech & BCN peptides´-SBE 40 Prize (15´)**: Title tbd, **Salvatore Assenza**, Soft Matter and Physics of Biopolymers, UAM & IFIMAC, Madrid, Spain
- **Hawk Biosystems-SBE 33 Prize (15´)**: Title tbd, **Pablo Carravilla**, Scilifelab, Karolinska Institutet, Stockholm, Sweden

13:30 - 14:30 Lunch break (Workshop tbd)

14:30 - 16:30 Poster Session II

16:30 - 17:00 Coffee break

17:00 - 19:00 Parallel Sessions

Plenary Room

Session V: Applied biophysics: for industry, biotechnology, health and green transition

Chairs: Aitziber L. Cortajarena, Edurne Rujas, Cecile Formosa

17:00 **Invited speaker**. *Challenges to make the Atomic Force Microscope a biomedical device*, **Dr. Etienne Dague**, Research Director of CNRS (LAAS-CNRS, ELIA equip), Université de Toulouse, France

17:30 **Invited speaker**. *Photosynthetic proteins in action! Towards a real-time investigation of how light-harvesting is regulated in plant*, **Dr. Nicoletta Liguori**, ICIQ, ICFO, Spain

18:00 **Platinum Sponsor**. *New techniques in biophysics research*, **Dr. Andrea Zapater**, Product Specialist BIO, Paralab-bio, Barcelona, Spain

18:15 **Oral contribution.** *Deciphering enzyme kinetics at the confined space*, **Fernando López-Gallego**, CIC biomaGUNE, Spain, (**Abstract #22**)

18:30 **Oral contribution.** *Biophysical and microscopic approaches to unravel the mechanism of action of peptide-based constructs for wound healing*, **Mariana Ferreira**, LAQV-REQUIMTE/FCUP, Portugal (**Abstract #186**)

18:40 **Flash Talk.** *Engineering Nanobodies for Biotechnological Applications*, **Gabriel Ortega**, CIC bioGUNE, Spain (**Abstract #193**)

18:45 **Flash Talk.** *Protein-based conductive inks: challenges in the design and production*, **Javier Porcayo-Loza**, CIC biomaGUNE, Spain (**Abstract #193**)

18:50 **Flash Talk.** *Detecting diseases-related oligonucleotides sequences: a multi-technique approach for label-free sensing*, **Silvia Maria Cristina Rotondi**, University of Genova, Italy (**Abstract #79**)

18:55 **Flash Talk.** *Mechanical stability of lipid bilayers in the presence of microplastics*, **Marina Pasquet**, Biofisika Institute, Spain (**Abstract #72**)

Parallel Session Room

Session VI: Computational biophysics: *Simulations, Artificial Intelligence, Machine learning, and Design*

Chairs: Armino Salvador, David de Sancho

17:00 **Invited speaker.** *Conformational space exploration and reactivity of minimal ribozymes for autocatalytic networks*, **Dr. Guillaume Stirnemann**, École Normale Supérieure & CNRS, France

17:30 **Invited speaker.** *Beyond the Active Site: Designing Efficient Enzymes Using Correlation and Evolutionary Information*, **Dr. Silvia Osuna**, Universitat de Girona, Spain

18:00 **Oral contribution.** *Computational/Experimental Synergy for the Study of Supramolecular Peptide Materials*, **Ivan Sasselli**,

Centro de Física de Materiales (CFM), CSIC-UPV/EHU, Spain
(Abstract #76)

18:15 **Oral contribution.** *Unraveling the Structure and Dynamics of Biomolecules via Computational Modeling*, **Florence Tama**, RIKEN Center for Computational Science, Kobe, Japan **(Abstract #92)**

18:30 **Oral contribution.** *Stochastic dilution and recovery of epigenetic marks*, **Ander Movilla Miangolarra**, John Innes Centre, Department of Computational and Systems Biology, United Kingdom **(Abstract #119)**.

18:45 **Oral contribution.** *Integrative Computational Modeling of Biochemical Processes: The Role of Protonation States and Conformational Dynamics in Ligand-Binding and Enzymatic Catalysis*, **Helena Girame**, Institute of Computational Chemistry and Catalysis, University of Girona, Girona, Spain **(Abstract #197)**.

19:00 Biophysical Society Assembly (closed event)

19:30 – 20:30 Social event: City visit and walk to Monte Urgull, Get together “Polvorín Bar terrace”.

Friday 7th June 2023

9:00 - 10:00 Plenary Session

Plenary Room

9:00 Plenary Lecture

Chair: tbd

Plenary speaker. *The emergence of ecological function*, **Prof. Álvaro Sánchez**, Institute for Functional Biology & Genomics, CSIC-University of Salamanca, Spain

10:00 - 10:30 Coffee break

10:30 - 12:30 Parallel Sessions

Plenary Room

Session VII: Synthetic biophysics: *self-organized and biomimetic systems*

Chairs: Beatriz Ibarra-Molero, tbd

10:30 **Invited speaker.** *Active Vesicles: Nanocontainers for temporally regulated cargo delivery*, **Dr. Mohit Kumar**, Assistant Professor, University of Barcelona, Senior Researcher, Institute for Bioengineering of Catalonia (IBEC), Spain

11:00 **Invited speaker.** *Sperm-carrying micromotors for gynecological cancer and infertility interventions* **Prof. Mariana Medina Sánchez**, CIC nanoGUNE, Spain

11:30 **Oral contribution.** *Nanostructural characterisation of glycosylated protein biomarkers interaction with lipid bilayer membranes: basis for biosensor development*, **Beatrice Barletti**, Institut Laue-Langevin, Grenoble, France (**Abstract #21**)

11:45 **Oral contribution.** *Surpassing substrate-enzyme competition by compartmentalization*, **Susana Carregal-Romero**, CIC biomaGUNE, Spain (**Abstract #46**)

12:00 **Oral contribution.** *A Designed Imaging Scaffold Breaks the Barrier to High-Resolution Structure Determination of Small Proteins by Cryo-EM*, **Roger Castells-Graells**, UCLA-DOE Institute for Genomics and Proteomics; Los Angeles, US (**Abstract # 42**)

12:15 **Flash talks.** *Exploring membrane fusion mediated by amphiphilic gold nanoparticles*, **Beatrice Leonardini**, Department of Physics, University of Genoa, Italy (**Abstract # 78**)

12:20 **Flash talks.** *Tuning the dimensionality of supramolecular functional materials based on the rational design of biomolecules*, **Laura Perez-Chirinos**, CIC biomaGUNE, Spain (**Abstract # 113**)

12:25 **Flash talks.** *Designing model photosystem for tracking protein dynamics in chromophore's light harvesting properties*, **Gonzalo Pérez Serrano**, IMDEA Nanociencia, Madrid, Spain (**Abstract # 38**)

Parallel Session Room

Session VIII: Membrane and membrane proteins (*receptors, ion channels and transporters*)

Chairs: Manuela Pereira, Marlene Martinho

10:30 **Invited speaker:** *The emergent role of aquaporins as drug targets for cancer therapeutics*, **Dr. Graça Soveral Soveral, Group Leader**, iMed.Ulisboa, University of Lisbon, Portugal.

11:00 **Invited speaker:** *Structural basis of bacteriophage T5 host recognition, infection trigger and E. coli cell wall perforation*, **Dr. Cecile Breyton**, Group Leader, Institut de Biologie Structurale, Grenoble, France

11:30 **Oral contribution.** *Dissecting metabotropic glutamate receptor activation by multicolor single molecule FRET*, **Emmanuel Margeat**, Centre de Biologie Structurale (CBS), Univ. Montpellier, CNRS, INSERM, Montpellier, France, (**Abstract #222**)

11:45 **Oral contribution.** *Effects of LLPS on the cell membrane and actin remodelling,* **Claire Buchanan**, Instituto Biofisika, Spain (**Abstract # 221**)

12:00 **Oral contribution.** *The ancient mechanism of membrane compartmentation of the glycosyltransferase enzyme MurG discovered by HS-AFM,* **Elodie Lafargue**, DyNaMo U1325-Université Aix-Marseille, Marseille, France (**Abstract # 29**)

12:15 **Flash talks.** *Towards the amino acid sensing mechanism of a lysosomal amino acid transporter,* **Jose Luis Vázquez-Ibar**, Université Paris-Saclay, CEA, CNRS, Institute for Integrative Biology of the Cell (I2BC), France (**Abstract # 118**)

12:20 **Flash talks.** *Optical control of cellular membrane fluidity using photoswitchable lipids,* **Noemi Jiménez-Rojo**, NCCR Chemical Biology, Department of Biochemistry, University of Geneva, Geneva, Switzerland (**Abstract # 53**)

12:25 **Flash talks.** *Mechanism for ring biogenesis and lipid membrane repair: Vipp1,* **Adai Colom**, Biofisika Institute (CSIC, UPV/EHU) Leioa, Spain (**Abstract # 3**)

12:30 - 13:30 Awards II (SFB, SPBF Awards, IUPAB)

SFB Award: SFB Young Researcher Prize (15´): Yeraldinne Carrasco-Salas

SFB Awardee: *Understanding the influence of surface state on Pseudomonas aeruginosa surface twitching: experiment and modelling,* **Yeraldinne Carrasco-Salas**, Laboratoire Interdisciplinaire de Physique, Grenoble, France.

SPBf award: SPBf Young biophysicist 2024 prize (25´) tbd

IUPAB announcements (10´)

13:30 - 14:30 Lunch break

14:30 - 16:30 Poster Session III

16:30 - 17:00 Coffee break

17:00 - 19:00 Parallel Sessions

Plenary Room

Session IX: Advanced Bioimaging

Chairs: Lorena Redondo, Carlo Manzo

17:00 **Invited speaker.** *Conformational dynamics of SARS-CoV-2 spike protein modulates the binding affinity to ACE2, **Dr. Felix Rico**, Associate Professor in Physics Department, Aix-Marseille University & INSERM, France*

17:30 **Invited speaker.** *3D Genome folding and topology in the eye of the STORM, **Dr. Marie Victoire Neguembor**, CRG, Barcelona, Spain*

18:00 **Oral contribution.** *Particle-tracking, super resolution microscopy and machine learning reveal the spatial-temporal regulation of exocytosis, **Sebastián Ortiz**, Universitat Pompeu Fabra, Barcelona, Spain (**Abstract #214**)*

18:15 **Oral contribution.** *Tuning in to nanoscale membrane dynamics with near-field optical antennas, **Thomas S. Van Zanten**, INMA-Instituto de Nanociencia y Materiales de Aragón, Zaragoza, Spain, (**Abstract #189**)*

18:30 **Oral contribution.** *Spatiotemporal Dynamics of Protein Export from the Endoplasmic Reticulum, **Roger Pons-Lanau**, ICFO-Institut de Ciències Fotoniques, The Barcelona Institute of Science and Technology, Barcelona, Spain (**Abstract #177**)*

18:45 **Flash talk.** *Protein-stabilized nanomaterials as MRI contrast agents: one size does not fit all, but versatility does, **Gabriela Guedes**, CIC biomaGUNE, Spain, (**Abstract #101**)*

18:50 **Flash talk.** *Visualizing Molecular Dynamics with High-Speed Tip-Scanning Atomic Force Microscopy, **André Körnig**, JPK BioAFM, Bruker Nano GmbH, Am Studio 2D, 12489 Berlin, Germany (**Abstract #93**)*

18:55 **Flash talk.** *Effects of microbial glycolipids on phospholipid membranes by Atomic Force Microscopy (AFM),* **Yulia Fok**, Aix-Marseille Universite, INSERM-CNRS, France (**Abstract #131**)

Parallel Session Room

Session X: Biological Physics

Chairs: Antoine Loquet, Javier Buceta

17:00 **Invited speaker.** *The microtubule/kinesin active nematic system: An intriguing biophysical material,* **Dr. Francesc Sagues**, Full Professor at the Department of Materials Science and Physical Chemistry, University of Barcelona, Spain

17:30 **Invited speaker.** *Bottom-up construction of life-like synthetic cells,* **Dr. Jean-Christophe Baret**, Institut de Biologie Physico-Chimique, Paris

18:00 **Platinum Sponsor.** *Abberior STED and MINFLUX: Super-resolution improves in all directions.* **Frederic.** ABBERIOR ROCKS, Germany

18:15 **Oral Contribution.** *Ionic Conductivity in Engineered Protein Thin Films,* **Lisa Almonte**, Applied Physics Department & IUUMA, University of Alicante, Spain (**Abstract #136**)

18:30 **Oral Contribution.** *Droplet-based improvement of artificial metalloenzymes,* **Aitor Manteca**, CIC biomaGUNE, Spain, (**Abstract #97**)

18:45 **Oral Contribution.** *Patterning and Mechanics in Bacterial Filaments,* **Javier Buceta**, Theoretical and Computational Systems Biology Program Institute for Integrative Systems Biology (I2SysBio), CSIC-UV, Valencia, Spain (**Abstract #145**)

19:00 Concluding Remarks

20:00 Conference Dinner: Muka Restaurant

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