

CNB

CENTRO NACIONAL DE BIOTECNOLOGIA



CSIC

CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

3rd workshop on ADVANCED NANOBIOSCIENCE

26th May, 2023

Auditorium, Centro Nacional Biotecnología
Campus Cantoblanco. UAM

The 2023 edition of the *Macromolecular Structures Department Workshop* at the CNB-CSIC will focus on **Advanced Biophysical Approaches** to foster our knowledge on protein spectrometry and sequencing, nucleic acids nanostructures, mechanisms of molecular motors, nanopores, and mechanobiology

TOPICS

- * Mass Photometry
- * Protein Sequencing
- * Optical & Magnetic Tweezers
- * Atomic Force Microscopy
- * Fluorescence based methods

KEYNOTE SPEAKERS

Philipp Kukura University of Oxford, United Kingdom

Sonja Schmid University of Wageningen, The Netherlands

Andra Dumitru Spanish National Center for Cardiovascular Research, Spain

INVITED SPEAKERS

Sara de Bragança National Center of Biotechnology (CSIC), Spain

Borja Ibarra IMDEA Nanociencia, Spain

Silvia Hormeño National Center of Biotechnology (CSIC), Spain

Silvia Hernández-Ainsa Institute of Nanoscience and Materials of Aragon, CSIC-UZ, Spain

David Rodríguez-Larrea Instituto Biofisika, Spain

Salvatore Assenza Autonomous University of Madrid, Spain

Pedro J. de Pablo Autonomous University of Madrid, Spain

Cristina Flors IMDEA Nanociencia, Spain

Victor G. Gisbert Materials Science Institute of Madrid (CSIC), Spain

Eva M. Martín-Cuevas National Center of Biotechnology (CSIC), Spain



REGISTER HERE!

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Funding



3rd Workshop on Advanced NanoBioscience. CNB-CSIC

Friday, 26th May, 2023

9:20 – 9:30 Welcome

Fernando Moreno-Herrero (CNB-CSIC, Madrid). Main organizer

Session 1: Advanced biophysical approaches based on microscopy, optical and magnetic tweezers

Chair: **Fernando Moreno-Herrero (CNB-CSIC, Madrid)**

9:30 – 10:15 Keynote TALK

Unravelling biomolecular structure, interactions and dynamics with mass photometry

Philipp Kukura (University of Oxford, UK)

10:15 – 10:35 *Unveiling the contribution of lncRNA NIHCOLE to the repair of DNA breaks using Magnetic Tweezers and Fluorescence-correlated Optical Trapping*

Sara de Bragança (CNB-CSIC, Madrid)

10:35 – 10:55 *Comparative analysis of force generation by dynamin isoforms during membrane remodelling*

Borja Ibarra (IMDEA-Nanociencia, Madrid, Spain)

10:55 – 11:15 *Exploring DNA repair at the single-molecule level*

Silvia Hormeño (CNB-CSIC, Madrid)

11.15 – 12.00 **Coffee Break (sponsored by Lumicks™)**

Session 2: Advanced biophysical approaches based on nanopores

Chair: **Sara de Bragança (CNB-CSIC, Madrid)**

12:00 – 12:45 Keynote TALK

The timing of life at the nanoscale **Sonja Schmid (Wageningen, The Netherlands)**



- 12:45 – 13:05 *DNA nanotechnology to engineer advanced nanomaterials for biomedical applications*
Silvia Hernandez-Ainsa (Institute of Nanoscience of Aragon, University of Zaragoza, Zaragoza)
- 13:05 – 13:25 *Analysis of single protein molecules with nanopores*
David Rodriguez-Larrea (Instituto Biofisika, Bilbao)
- 13:25 – 13:45 *Getting a grip on dynamic single molecules with correlative optical tweezers*
Emma Verver (LUMICKS™, The Netherlands)

13:45 – 15:00 **Lunch + Poster Session**

Session 3: Advanced biophysical approaches based on AFM

Chair: **Eva M. Martin (CNB-CSIC, Madrid)**

15:00 – 15:45 Keynote TALK

Decoding mechanical fingerprints of cellular components in pathological conditions: a multiscale perspective

Andra Dumitru (CNIC, Spain)

- 15:45 – 16:05 *Physical Virology with atomic force and fluorescence microscopies: exploring the biophysics of individual virus particles*
Pedro J. de Pablo (UAM, Madrid)
- 16:05 – 16:25 *How much force is needed to kill a single bacterium?*
Cristina Flors (IMDEA-Nanociencia, Madrid)
- 16:25 – 16:45 *Structural analysis of single-stranded RNA molecules using Atomic Force Microscopy*
Eva M. Martin (CNB-CSIC, Madrid)
- 16:45 – 17:05 *Nanorheology and Nanoindentation Revealed a Softening and an Increased Viscous Fluidity of Adherent Mammalian Cells upon Increasing the Frequency*
Victor G. Gisbert (ICMM, Madrid)
- 17:05 – 17:25 *Bridging the scales in DNA flexibility from nucleotides to single-molecule techniques via molecular simulations*
Salvatore Assenza (UAM, Madrid)

17:25 **Closing and farewell**

