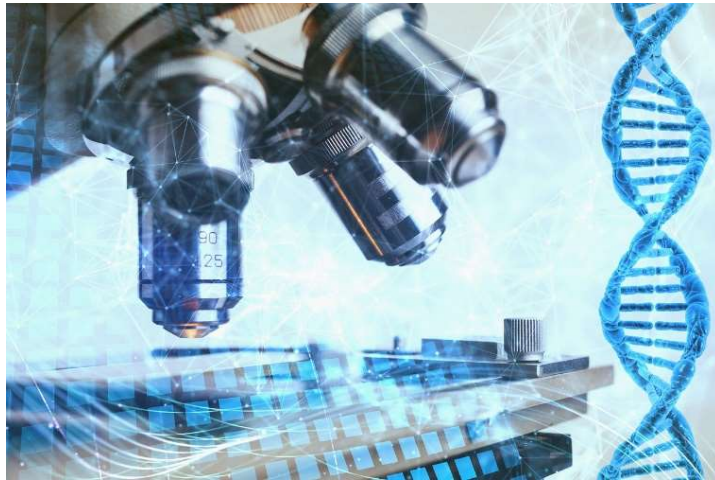


AGENDA

1st CTB Workshop on Biosensors and Biomaterials

27th October 2023 11:00 – 14:00

Special guest: Fanny d'Orlyé
Chimie ParisTech, PSL



Venue: Center for Biomedical Technology (CTB) auditorium
Universidad Politécnica de Madrid (UPM), Campus Montegancedo
M-40 km. 38, 28223 Pozuelo de Alarcón, Madrid.

How to arrive: <http://www.ctb.upm.es/contact/>

Zoom link: <https://upm.zoom.us/j/87504361313>

11:00 – 11:05 Welcome, Dr. Gustavo Guinea, Director of [Center for Biomedical Technology](#) (CTB-UPM)

11:05 – 11:10 Special guest introduction, Dr. Javier Serrano, [Bioinstrumentation and Nanomaterials Lab](#) (CTB-UPM)

11:10 – 12:00 **Session 1:** “Functional nanomaterials for molecular diagnostics and imaging: contribution of electrokinetic methodologies towards an integrative approach”, Dr. Fanny d’Orlyé, [Chimie ParisTech PSL](#)

12:00 – 12:20 **Session 2:** “Research lines of the Bioinstrumentation and Nanomaterials Lab”, Dr. Javier Serrano, [Bioinstrumentation and Nanomaterials Lab](#) (CTB-UPM)

12:20 – 12:40 **Session 3:** “Advances in In Vitro Diagnostic Systems and Organ-on-Chips for several Bioapplications”, Dr. Beatriz Santamaría, [Optics, Photonics and Biophotonics Lab](#) (CTB-UPM)

12:40 – 13:00 **Session 4:** “Application of functionalized DeepTip probes in affinity atomic force microscopy”, Dr. José Pérez-Rigueiro, Biomaterials and Regenerative Bioengineering Lab (CTB-UPM)

13:00 – 13:20 **Session 5:** “An overview of ultrasensitive and multiplexed biomarker detection using Mecwins technology”, Dr. Valerio Pini, [Mecwins](#)

13:20 – 13:50 **Session 6:** Open discussion, moderator Dr. Javier Serrano, [Bioinstrumentation and Nanomaterials Lab](#) (CTB-UPM)

13:50 – 14:00 Conclusions and closure, Dr. Javier Serrano



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SPEAKERS

Speaker 1 (special guest): Dr. Fanny d'Orlyé

Dr Fanny d'Orlyé received her Ph.D. in Physical and Analytical Chemistry in 2008 from the Pierre and Marie Curie University (Sorbonne University), France. She then worked for two years at the French Alternative and Atomic Energies Agency (CEA). In 2011, she joined Chimie ParisTech and the laboratory Physicochemistry of Electrolytes, Colloids and Analytical Sciences (PECSA) as associate lecturer and researcher. Currently, she is developing her research at the Institute of Chemistry for Life and Health Sciences (i-CLeHS) at PSL University.

Dr d'Orlyé has been working in the field of electrokinetic separation sciences and nanomaterials for more than fifteen years and has published over 40 papers in this field. Her current interest deals with the engineering of self-assembled peptide nanoarchitectures in solution and at interfaces for on-chip sensing or targeted imaging and therapy in vivo. Dr d'Orlyé aims at developing original chemical and biochemical tools to explore key biological processes (e.g. protein corona, aptamer-target interactions...), focusing both on the conception of new therapeutic vectors and the detection of disease-related biomarkers.

Session 1: "Functional nanomaterials for molecular diagnostics and imaging: contribution of electrokinetic methodologies towards an integrative approach"

The use of nanomaterials raises growing interests in various current emerging fields of research such as nanotechnologies, diagnosis assays and therapy. As the introduction of nanomaterials in physiological media may induce surface modifications and aggregation or size enlargement, their surface passivation is a very crucial challenge to prevent non-specific protein adsorption and thus extend their circulation time, but also to ensure their biocompatibility, in vivo stability, biodistribution and bioreactivity for specific targeting and drug delivery.

This lecture intends to give a critical overview of electrokinetic methodologies recently developed for allowing not only the complete characterization of new nanoprobe, on going from metallic particles to polymer- and peptide-based nanomaterials, but also for helping in their design and in the selection of chemical conditions relevant for their storage and further manipulation. The perspectives of new strategies to quantitatively characterize specific and non-specific interactions between multifunctional nanovectors and plasma proteins or the main components (phospholipids, integral proteins, carbohydrates) of cell membranes will be investigated. Eventually, the potentialities of such nanomaterials for the development of diagnostic assays and bioimaging technologies will be addressed.

Speaker 2: Dr. Javier Serrano

Professor José Javier Serrano Olmedo got his degree in Telecommunication Engineering in 1990 and his PhD. in Telecommunication Engineering in 1996 at the Engineering School on Telecommunication at the Technical University of Madrid (UPM). He has more than 30 years of experience teaching on Electronic Instrumentation, Bioinstrumentation, Biosensors, Technologies for Nanomedicine, Human Computer Interfaces, Electronic Health Records and Clinical Engineering. He is the Coordinator of the UPM Doctorate Program on Biomedical Engineering, a fellow member and Co-PI of the Networking Center for Biomedical Research on Bioengineering, Biomaterials and Nanomedicine, and PI of the Laboratory of Bioinstrumentation and Nanomedicine, a facility of the Life Supporting Technologies Group, at the Center for Biomedical Technology at UPM (CTB-UPM). He is member of the Spanish Society of Biomedical Engineering, the Spanish Society of Clinical Engineering and of the European Society of Hyperthermic Oncology. He has published more than 100 papers and conference contributions, released 4 patents, participated or headed more than 50 projects and supervised more than 20 doctoral theses.

Speaker 3: Dr. Beatriz Santamaría

Graduated in Physics from the University of Salamanca, and obtained the Ph.D. in Mechanical Engineering from the Polytechnic University of Madrid (UPM). Thanks to the results obtained from her thesis focused on the development of an optical biosensor for the detection of dry eye disease, she received the cum laude distinction as well as the runner-up prize for the Francisco del Pozo Award from the Center for Biomedical Technology (CTB) and the extraordinary doctoral thesis award. Currently, she continues her research on optical biosensors, optical characterization of materials, and in-vitro detection methods within the Optical, Photonics, and BioPhotonics Group (GOFB) at the CTB of this university. In addition, she is an assistant professor at the Higher Technical School of Engineering and Industrial Design at the UPM and combines research and teaching with active participation in the Women's Area of the Spanish Optics Society and the mentoring program of the ASTI Foundation.

Speaker 4: Dr. José Pérez Rigueiro

Graduate in Physics and PhD in Applied Physics. Master in Biochemistry and Molecular Biology by Universidad Autónoma de Madrid. Member of the Departamento de Ciencia de Materiales (Universidad Politécnica de Madrid). Full Professor since 2020. Researcher in Centro de Tecnología Biomédica (CTB). Main research areas: silk and biomedical applications of silk-based materials and biofunctionalization of surfaces. The research activity is complemented with an intense academic work in the field of Biomaterials in the Degrees of Materials Engineering, Biomedical Engineering and Biotechnology. Author of 2 textbooks "Biological Materials and Biomaterials" and "Iniciación de la Física Estadística".

Speaker 5: Dr. Valerio Pini

Senior Scientist and Head of Engineering at Mecwins, with over 15 years of experience in the field of nanotechnology. He received his B.Sc. and M.Sc. degrees in Physics from the University of Florence in 2005 and 2008 respectively. He then obtained his M.Sc. in Nanotechnology and Advanced Materials from the Universidad Autónoma de Madrid (UAM) in 2010. In 2016, Valerio received his Ph.D. in Nanotechnology and Advanced Materials from the UAM, where he was awarded both Cum Laude and the Extraordinary Ph.D. Award for 2015/2016. He has significant expertise in mathematical modeling, as well as in the design and prototyping of opto-mechanical and plasmonic systems. Throughout his career, he has participated in more than 10 international research projects, co-authored 26 high-impact peer-reviewed publications (with an H-index of 16 and over 1000 citations), filed 5 patents, and authored a book chapter. Pini has presented his work at over 50 international conferences, and serves as a reviewer for numerous nanotechnology-related scientific journals. He joined Mecwins in 2016 as a senior scientist, and was promoted to head of engineering in 2020.

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