



European Materials Research Society

# 2025 Spring Meeting

May 26 – 30 | Strasbourg Convention Centre

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## SYMPOSIUM I

Designed and engineered soft materials for biomedicine and bioelectronics

Oral sessions : **CHURCHILL – FIRST FLOOR**

Poster sessions : **ETOILE – FIRST FLOOR**

Symposium Organizers:

Anuja DATTA (Main organizer), School of Applied & Interdisciplinary Sciences (SAIS), Indian Association for the Cultivation of Science (IACS), India

Hirak K PATRA, Advanced Therapeutics, Department of Surgical Biotechnology, UCL Division of Surgery and Interventional Science, Faculty of Medical Sciences, University College London, UK

Sohini KAR-NARAYAN, University of Cambridge, Department of Materials Science, UK

Yeonsik CHOI, Yonsei University, Department of Materials Science and Engineering, South Korea

Symposium Sponsor:

**APL Electronic  
Devices**

*Selected contributions will be considered for publications after peer-review process in: APL Electronic Devices (AIP), BMC Medicine (Springer Nature) and Special issue in Journal of Physics D: Applied Physics (IOP).*

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Monday May 26

I01 Bio-Organic Electronics: Materials/Devices

Chairperson(s): DATTA Anuja

KAR-NARAYAN Sohini

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08:30	959	Organic Bioelectronic Materials with New Functionalities <b>NIELSEN Christian (Invited)</b>
09:00	449	Intelligent Wearable Skins for Soft Biodiagnostics <b>CHENG Wenlong (Invited)</b>
09:30	1763	Bioresorbable electronic devices: electrophysiological monitoring & diagnosis <b>SOULIGOUX-BABIN Thibaut</b>
09:45	752	Shape-deployable and biodegradable materials for next-generation brain interfaces <b>BAE Jae-Young</b>

Monday May 26

I02 Human-Machine Interfaces & Techniques in Bio-Medics

Chairperson(s): CHOI Yeonsik

DATTA Anuja

[View session abstracts](#)

10:30	207	Soft magnetoelectronics for human-machine interfaces, prosthetics, and medical tools <b>MAKAROV Denys (Invited)</b>
11:00	1291	Tunable thermal interface soft materials with magnetically aligned and 3D-interconnected composite structures <b>KAIDAROVA Altynay</b>
11:15	2203	HydroLIG: selective drug delivery via hydrogel/LIG smart actuators <b>SANCHEZ DIAZ Raquel</b>
11:30	2586	Laser-Induced Graphene: Innovative Fabrication and Advanced Characterization for Biomedical Applications <b>HERNÁNDEZ CUBAS Lidia Lizbeth</b>

Monday May 26

I03 Polymer and Hydrogels for Bio- Electronics & -Medics 1

Chairperson(s): DATTA Anuja

PATRA Hirak

[View session abstracts](#)

14:00	1273	Cell Response Driven by Surface Charges on electrospun polymer fibers <b>STACHEWICZ Urszula (Invited)</b>
15:00	1339	Azobenzene-modified PEDOT derivatives for applications in light-activated neuromorphic devices <b>MAWAD Damia</b>
15:15	1449	Recyclable and Conductive Chitosan/Agarose/PEDOT:PSS Hydrogels for Bioelectronics and Eco-Sustainable Applications <b>Naranjo David</b>
15:30	2017	Advancing Soft Electronics with Multiresponsive Alginate/Gelatin Organohydrogels <b>TORDI Pietro</b>
15:45	1123	Electroconductive hydrogel for skin regeneration: a riboflavin-crosslinked gelatin/PEDOT:PSS hybrid novel material <b>RESINA Leonor</b>

Monday May 26

IP01 Poster session

[View session abstracts](#)

16:30	01_1096	Piezoelectric Micropower Harvester and BioSensor from Chiral Ambipolar Chromophores Supramolecular Assembly <b>PAUL Swadesh</b>
16:30	02_1176	Pyroelectric sensor from a supramolecular chiral ambipolar $\pi$ -system <b>SADHUKHAN Pritam</b>
16:30	03_1293	Low-impedance tissue-device interface using homogeneously conductive hydrogels chemically bonded to stretchable bioelectronics <b>SHIN Yoonsoo</b>
16:30	04_1487	Engineered Stability and Sensitivity: SERS-active dendritic nanoplatfoms for therapeutic drug monitoring <b>DWIVEDI Aradhana</b>
16:30	05_177	Innovative Lithographic Platform For Reference-free Traction Force Microscopy <b>MAMAN Brit</b>

16:30	06_178	Nanoscale Device for the Control Study of the Special Activation- Inhibitory Balance in T Cells <b>MAMAN Brit</b>	16:30	21_2573	Novel gating mechanism employed on nano bio-FET towards real-time, point-of-care diagnostics in human whole blood <b>GARIKA Vijay Kumar</b>
16:30	07_182	Functional and Hierarchical 3D Printed Scaffolds for Bone Tissue Engineering using 3Y-TZP/HAp Composites <b>Antunes Elsa</b>	16:30	22_2727	Improved Mechanophore Activation in Hydrogel Networks Mediated by Crosslinking Strength and network architecture <b>FORER Meytal</b>
16:30	08_1865	Catechol-Functionalized, pH-responsive biopolymers with ROS-generating and potentiating antibacterial properties <b>ZEROUG-METZ Lena</b>	16:30	23_2779	Fetal Membrane Collagen Fibers Microstructure and Intrinsic Mechanics – new Insights into Preterm Birth <b>BEN-MOSHE Noa</b>
16:30	09_1958	Dual drug delivery system based on porous fibers grafted with MOFs <b>KIM Juran</b>	16:30	24_2798	Next-generation polymeric semiconductors for organic electrochemical transistors <b>LUTSEN Laurence</b>
16:30	11_1979	A multilayered nanofibrous-hydrogel scaffold for the scar-free regeneration of skin incorporating bioactive agents for the treatment of ballistic trauma <b>MEGHA Megha</b>	16:30	25_2903	Plasma-Generated Nitric Oxide Water for Biological Applications: Infection Control and Cosmetic Innovations <b>KAUSHIK Nagendra Kumar</b>
16:30	12_1980	Synthesis and characterization of an injectable hydrogel scaffold for bone tissue engineering applications <b>MUKHERJEE Eshita</b>	16:30	26_2980	Composite semiconducting nanoparticles for the optical modulation of cell function <b>TULLI Gabriele</b>
16:30	13_1985	Biofortified nanofibrous scaffold composed of soy protein isolates for tissue engineering application <b>TRIPATHI Avinash</b>	16:30	27_2993	Laser-induced photo-crosslinking of hydrogel for controlled release <b>TOZAR Tatiana</b>
16:30	14_1993	Cotton fabric based colorimetric sensor for detection of volatile aldehydes, and ketones <b>MUKHERJEE Eshita</b>	16:30	28_3008	Bispecific nanobody-based electrochemical sensors for synchronous detection of pathogens from wheat <b>PISKIN Sena</b>
16:30	15_2260	Non-Ideal Nernstian Behavior in Organic Electrochemical Transistors: Fundamental Processes and Theory <b>FARIA Gregório Couto</b>	16:30	29_3013	Microwave assisted methacrylation of alginate to develop injectable microcryogels for bioengineering applications <b>ÖZBEK Merve Asena</b>
16:30	16_2320	Development and Characterization of Albumin-Based Materials <b>AKBARPOUR Zahra</b>	16:30	30_3064	Functionalized Biosilica with Curcumin: Comparative Analysis of Crosslinking Methods <b>SOUSA Karolyne</b>
16:30	17_2370	Exploring Multi-Drug Therapeutics within a 3D Microphysiological Kidney Cancer-on-Chip Platform <b>GUPTA Upasana</b>	16:30	31_317	Design and Computational Analysis of an Organic Soft Molecule as a Target for Biomedicine <b>BENHARKAT Nour Eddine</b>
16:30	18_2389	3D Printed Protein-Driven Autonomous Folding and Unfolding Actuator for Controlled Drug Delivery <b>LIU Yuchen</b>	16:30	32_346	Carboxymethyl cellulose and PEDOT-based sensor-actuator for bacterial infection detection during skin tissue regeneration <b>RESINA Leonor</b>
16:30	19_2481	Comprehensive Neurotoxicity of Lead Halide Perovskite Nanocrystals in Nematode <i>Caenorhabditis elegans</i> <b>NGO Thi Loan</b>	16:30	33_411	Mimicking Scroll Tightness of Descemet Membrane Endothelial Keratoplasty (DMEK) Grafts Using Hydrogel-based Model <b>KUMAR Amit</b>
16:30	20_2562	High Strength Machinable Bioactive Magnesium-Bioglass Composite via Powder Metallurgy Route <b>DAS Samir</b>	16:30	34_43	Biodegradable Radical Polymer for High-Performance, Physically Transient Organic Memory Devices <b>CHO Sangho</b>

16:30	35_447	Intrinsically adhesive and conductive hydrogel bridging the bioelectronic-tissue interface for biopotentials recording <b>LAO Jiazheng</b>
16:30	36_60	Leveraging Thiol functionalized biomucoadhesive hybrid nanoliposome for local therapy of Ulcerative colitis <b>. Kanika</b>
16:30	37_74	CD-Integrated Metal-Organic Gel: A pH-Responsive Drug Delivery System for Visible Light-Induced Chemo-Photodynamic Therapy and Optical Imaging of Cancer Cells <b>MAITI Sayani</b>

Tuesday May 27

**I05 Polymer and Hydrogels for Bio- Electronics & -Medics 2**

Chairperson(s): DATTA Anuja

PATRA Hirak

[View session abstracts](#)

08:30	2974	Multifunctional Modular Hydrogels for Biofabrication and Wound Care <b>AILI Daniel (Invited)</b>
09:00	3083	Visible light-based 3D/4D-Bioprinting of Cell-laden Hydrogels <b>CHATTERJEE Kaushik (Invited)</b>
09:30	3002	Flexible Hydro/Aerogels for Biosensing and Therapy <b>LI Peng</b>
09:45	1076	N-type Semiconducting Hydrogel <b>LI Peiyun</b>

Tuesday May 27

**I06 Extracellular Matrix Interface for Bioelectronics & Biomedics**

Chairperson(s): DATTA Anuja

KAR-NARAYAN Sohini

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10:30	1540	Electroactive extracellular matrix materials for bioelectronics and biomedicine <b>NAIR Malavika (Invited)</b>
11:00	2504	Engineering a 3D Extracellular Matrix Model to Investigate Arsenic-UVB Synergy cutaneous Squamous Cell Carcinoma (cSCCs) <b>KUMAR Nikhil</b>
11:15	1279	Effect of micro and nano plastics pollution on bulk and local mechanical properties of soft composites used as extracellular matrix models <b>LE ROI Baptiste</b>

11:30	1896	Electromechanical Stimulation as a Tool for Tissue Engineering: Exploring Routes for Soft Bio-Electromechanical Constructs <b>BURGESS Matthew</b>
11:45	1726	P3HT- based electroactive films for in vitro neuronal cell interfacing <b>CAMPIONE Paola</b>

Tuesday May 27

**I07 Self Powered Materials and Devices for Bioelectronics**

Chairperson(s): CHOI Yeonsik

KAR-NARAYAN Sohini

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14:00	3119	Functionally Graded Piezoelectric Composites for Biological Applications <b>KHANBAREH Hamideh (Invited)</b>
14:30	2711	Piezoelectric catalyst BaTiO <sub>3</sub> and K <sub>0.5</sub> Na <sub>0.5</sub> NbO <sub>3</sub> incorporated poly(vinylidene fluoride) for orthopedic self-powered implants <b>DUBEY Ashutosh Kumar (Invited)</b>
15:00	2415	High-frequency Vagus Nerve Stimulation for Obesity Treatment using Millimetric Ultrasound-driven Triboelectric Nanogenerator <b>JEONG Jang-Mook</b>
15:15	3061	Optimizing Electrode Assembly Techniques to improve Triboelectric Nanogenerators Performance for Battery-Free Cardiovascular Electronic Devices <b>ALMEIDA Ana Catarina</b>
15:30	934	Maximizing triboelectric power generation via titanium-liquid coupling to overcome the acoustic energy barrier in implantable bioelectronics <b>CHUNG Youngwook</b>
15:45	2696	Industrial Production of Poly(L-Lactide) Piezoelectric Films: From Fundamental Process-Structure-Properties Relationships to Emerging Applications <b>SHEN Hui</b>

Tuesday May 27

I08 Biosensors : Materials Engineering

Chairperson(s): KAR-NARAYAN Sohini

PATRA Hirak

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17:00	2663	Imperceptible augmentation of living systems with organic bioelectronic fibres <b>HUANG Shery (Invited)</b>
17:30	299	Chemically Modified Graphene Biosensor with Aptamers and Zwitterions for Specific Recognition of SARS-CoV-2 <b>GODA Tatsuro</b>
17:45	1031	Development of Polypyrrole Nano-Arrays on Carbon Paper for Enzymatic Glucose Sensing in Saliva <b>GUPTA Shivam</b>
18:00	189	Meta-Crack-Based Thin Film Strain Sensor for Soft Yet Ultrasensitive Electronics <b>KANG Seung-Kyun</b>
18:15	2574	Overcoming the Challenges Associated with Solution Gating in Field-Effect Transistor-Based Biosensors <b>GARIKA Vijay Kumar</b>

Wednesday May 28

I09 Design & Engineering of Biomaterials and Polymers for Medical Applications

Chairperson(s): DATTA Anuja

PATRA Hirak

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08:30	785	Chain-Folding Regulated Hierarchical Assembly of Amphiphilic Polymers and Biomedical Applications <b>GHOSH Suhrit (Invited)</b>
09:00	324	The Molecular Envelope Technology (MET) drug delivery platform - from polymer engineering to clinical application <b>SCHATZLEIN Andreas (Invited)</b>
09:30	2935	Redox-Activable Heavy Atom Free Photodynamic Therapy <b>BANERJEE Tanushri</b>
09:45	306	Fibrin mimetic pH-Tunable Strain Stiffening Peptide-Polymer Conjugate to Augment Myogenesis <b>NATH Debasish</b>

Wednesday May 28

I10 Systems for Bio- Implants and In-Vivo Applications

Chairperson(s): CHOI Yeonsik

DATTA Anuja

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10:30	686	Direction Selection and Motion Speed Determination in Artificial Photoreceptor based blind retinae <b>NARAYAN K.S. (Invited)</b>
11:00	2049	Wireless, battery-free, and fully implantable neurostimulator powered by ultrasound-driven capacitance-matched triboelectric implants <b>HWANG Joon-Ha</b>
11:30	2859	Cartilage-inspired liposome-reinforced recombinant hyaluronic acid-based hydrogels: Fabrication, characterization, and evaluation <b>SUNDARAM Manoj Kumar</b>
11:45	2908	Computational Design of Short Peptides to Engineer Membraneless Organelles <b>GHALANDARI Behafarid</b>

Wednesday May 28

I11 Nano-Bio Materials: Processing & Advanced Techniques

Chairperson(s): DATTA Anuja

PATRA Hirak

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14:00	3097	Increasing the topological dimensionality of flexible neural probes <b>RINCÓN MONTES Viviana (Invited)</b>
14:30	2998	Sustainable Dissolvable Microneedles for Stimuli-Responsive Nanoparticle Delivery in Inflammatory Skin Diseases <b>TOPCU Guliz</b>
14:45	990	Low-Cytotoxic and Highly Efficient Type I Photoinitiators for Visible LED-/Sunlight-Induced Photopolymerization and High-Precision 3D Printing <b>XIAO Pu</b>
15:00	3138	Direct Laser Writing of Photofunctional 3D Microstructures for Imaging and Photoresponsive Materials <b>HENWOOD Adam</b>
15:15	135	Optimization of 4D Printing Parameters for Shape Memory Polymer Blends <b>MAHAPATRA Shivani</b>

Thursday May 29

I12 Bio-Organic Electronics: Materials/Devices

Chairperson(s): CHOI Yeonsik

DATTA Anuja

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08:30	996	Self-acid-doped PEDOT derivatives for soft bioelectronics <b>MAWAD Damia (Invited)</b>
09:00	389	Measuring heterogeneity and stiffness of healthy, stored and diseased red blood cells using a fast microfluidic device <b>PAUL Debjani (Invited)</b>
09:30	3036	Materials-Driven Phototaming of Bacterial Bioelectricity <b>GIUSEPPE MARIA Paterno</b>
09:45	2147	Optimisation of a step emulsification microfluidic device for the generation of hydrogel beads <b>BISWAS Neha</b>

Thursday May 29

I13 BioInterface and Biomimetics

Chairperson(s): DATTA Anuja

PATRA Hirak

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10:30	2992	Tuning the biointerface: Opportunities to enhance bio-compatibility/-recognition capability <b>UZUN Lokman (Invited)</b>
11:00	2397	Biomimetic Electrospun Scaffold as sustainable wound dressing materials <b>MESSINA Grazia Maria Lucia (Invited)</b>
11:30	1405	Hybrid Biomimetic Nanoparticles: A Breakthrough Strategy for Early Glioblastoma Multiforme Targeting <b>ROBLES-FERNÁNDEZ Ana</b>
11:45	1509	Challenging the Blood Brain Barrier Using Biomimetic Nanoparticles for the Treatment of Glioblastoma <b>JIMÉNEZ-BOLAND Daniel</b>

Thursday May 29

I14 Multifunctional Soft-Materials and Hybrids for Drugs, Therapy & Tissue Engineering 1

Chairperson(s): DATTA Anuja

PATRA Hirak

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13:30	1734	Conductive Hydrogels for Soft and Multimodal Bioelectronics <b>MINEV Ivan (Invited)</b>
14:00	2666	Advances in Multifunctional Polymeric Nanoformulation: Efficacy against Resistant Bacteria and Antibiofilm Functionalities <b>GHOSH Srabanti (Invited)</b>
14:30	91	Synergistic antibacterial enhancement for Greenly engineered bimetallic Ag-ZnO nanohybrids <b>ALMUTAIRI Hayfa</b>
14:45	1308	Antibacterial Nanobiocomposites Based on Gallium and Glucose <b>ASGHAR NEJAD LASKOUKALAYEH Masoomeh</b>
15:00	484	Functionalized Carbon Dots as a Multifunctional Approach Against Neurodegenerative Diseases <b>GÓMEZ PÉREZ Inmaculada Jénifer</b>
15:15	1880	Rational design of polyion complex micelles for nanostructured functional hybrids <b>RYDZEK Gauthier</b>
15:30	2817	Engineered Zinc Nanosystem for Targeted Anti-tumour Approach <b>DAS Amlan</b>
15:45	2754	Pre-clinical safety assessment of Living drug delivery devices <b>MEKONTSO NGAFFO Joelle Aurelie</b>

Thursday May 29

I15 Multifunctional Soft-Materials and Hybrids for Drugs, Therapy & Tissue Engineering 2

Chairperson(s): DATTA Anuja

PATRA Hirak

[View session abstracts](#)

16:30	1070	Transdermal Sensing of Disease Biomarkers Enabled by Epidermal Microneedle Patch <b>PARLAK Onur (Invited)</b>
17:00	134	Programming fibril alignment and mechanical response in electron beam-modified collagen type I fibers <b>SCHÜTTE Friedrich</b>
17:15	2484	Optically actuatable plasmonic nanocomposite for cardiac tissue engineering <b>GUO Fanglei</b>
17:30	2526	Towards biodegradable and stretchable electrodes based on iron nanowire composites <b>KAHLER Friso</b>
17:45	2929	Optotracing for analysis of bacterial biofilms on soft surfaces <b>RAY Sanhita</b>
18:00	3072	Design and engineering of surfaces for optimum cardiac cell behaviour <b>KONTZIAMPASIS Dimitrios</b>
18:15	844	Polymer hydrogel-tissue biohybrid processing technology for 3D molecular mapping of the human brain <b>PARK Juhyuk</b>