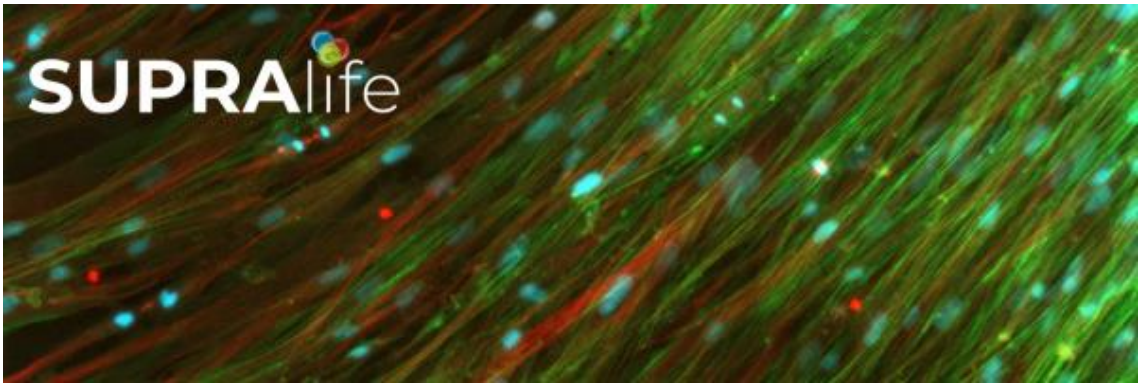


SUPRALIFE **NEWSLETTER** **#5**
JULY 2025

Dear SUPRALIFE Friends and Colleagues,

We are pleased to share the fifth issue of the SUPRALIFE's Newsletter.

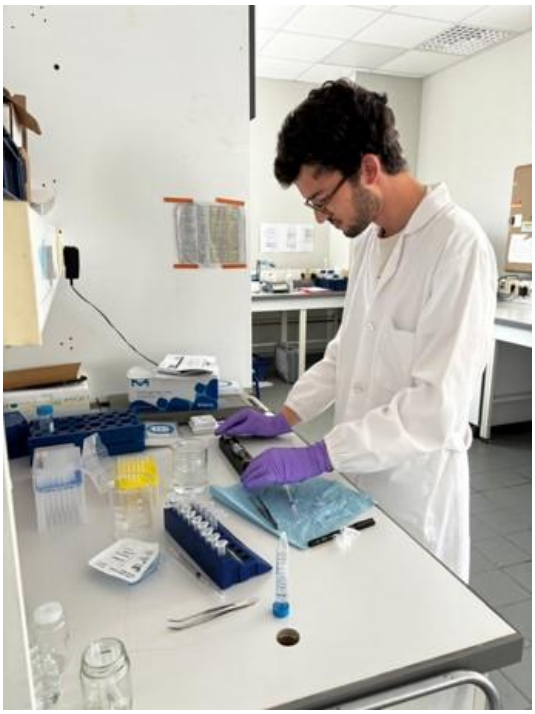
IN THIS NUMBER:

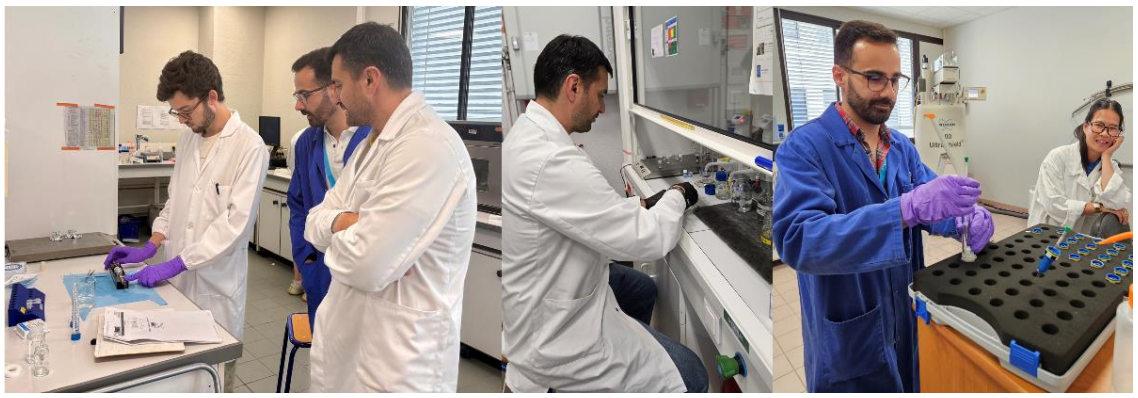
SHORT-TERM ON-SITE TRAINING ACTIVITIES AND STAFF EXCHANGES/VISITS AT THE EINDHOVEN UNIVERSITY OF TECHNOLOGY AND THE UNIVERSITY OF BORDEAUX | 2025

In 2025, the SupraLife consortium continued its dynamic short-term on-site training activities across partner institutions, building upon the momentum established in the

previous year. Following the successful placements of the PhD students Cristiana Sousa and Vera Sousa, both from the University of Aveiro (UAVR, Portugal), in 2024 and the beginning of 2025, the program expanded to include additional PhD students and postdoctoral researchers, and also promoted the exchange of staff members, further strengthening the exchange of knowledge and expertise, as well as the collaboration in-between teams in Aveiro, Eindhoven and Bordeaux.

At the University of Bordeaux (UBx, France), the PhD student Gonçalo Coelho, and the researchers Luís Almeida and João Rodrigues, all affiliated with UAVR, joined the team led by Sébastien Lecommandoux, and also including Angela Mutschler, Elisabeth Garanger, Colin Bonduelle, and Emmanuel Ibarboure for short-term on-site training activities. At UBx, they got hands-on experience on the preparation of polymersomes and learned new cutting-edge characterization techniques in supramolecular and polymer science.



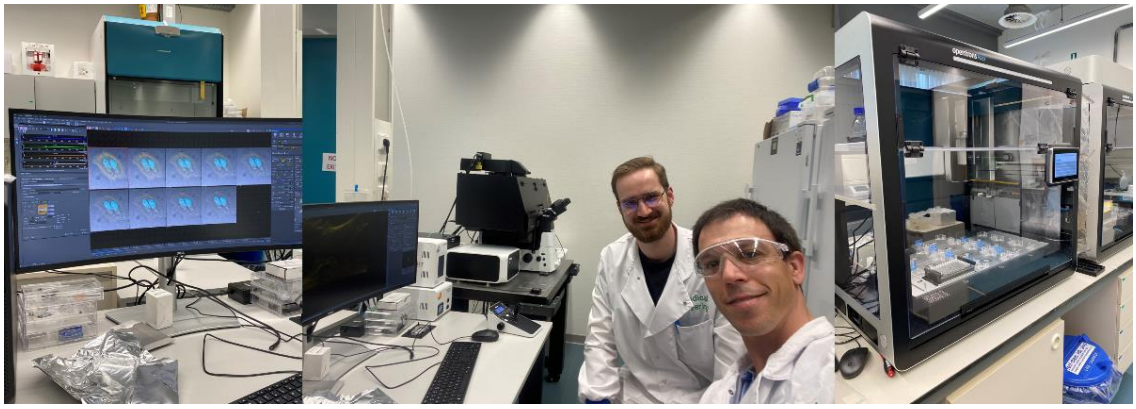


Gonçalo Coelho has been working on the development of giant polymersomes with fluorescent and/or surface-charged properties under the supervision of Sébastien Lecommandoux, Angela Mutschler and Emmanuel Ibarboure. His work at UBx will continue at UAVR, where the developed polymersomes will be used for cell internalization and layer-by-layer assembly studies.

Luís Almeida focused on the synthesis and nuclear magnetic resonance (NMR) analysis of functionalized natural-origin polymers aiming for the assembly of stimuli-responsive boronic acid-based hydrogels for tissue engineering and regenerative medicine strategies. These dynamic and reversible interactions play a crucial role in hydrogel network formation and endow the materials with pH- and temperature-responsiveness - important characteristics for advanced biomedical applications.

Meanwhile, João Rodrigues took the opportunity to learn and apply gel permeation chromatography (GPC), a powerful technique for determining the molecular weight of polymers. By analyzing a variety of functionalized natural and synthetic polymers, he gathered essential data to better understand and predict the supramolecular assembly behavior of hydrogels for bioapplications.

These short-term on-site training activities not only advanced individual projects, but also strengthened the collaboration in-between UAVR, UBx and its affiliated entitied Bordeaux INP and CNRS, contributing to the SUPRALIFE consortium's goal of integrating expertise across institutions to develop next-generation supramolecular biomaterials for healthcare.



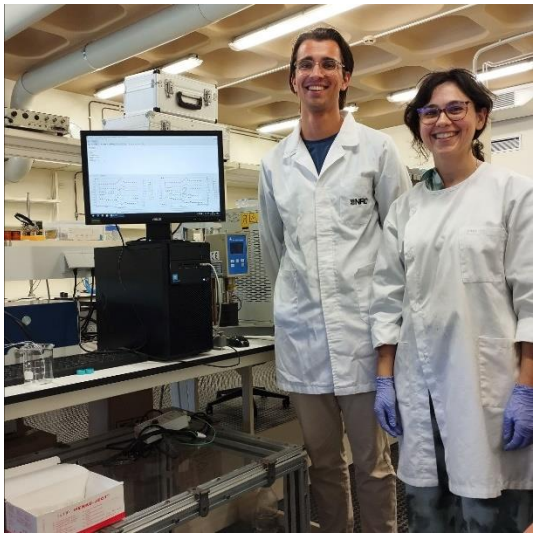
João Borges carried out a staff exchange/visit at the Eindhoven University of Technology (TU/e, The Netherlands). The visit aimed to exchange knowledge, discuss ongoing research activities and project developments, write joint research articles, and analyze results with leading TU/e scientists, including E.W. "Bert" Meijer, Patricia Dankers, and their teams. This exchange also provided an excellent opportunity to reflect on the SUPRALIFE project's progress and engage in strategic discussions regarding future joint activities between UAVR and TU/e.

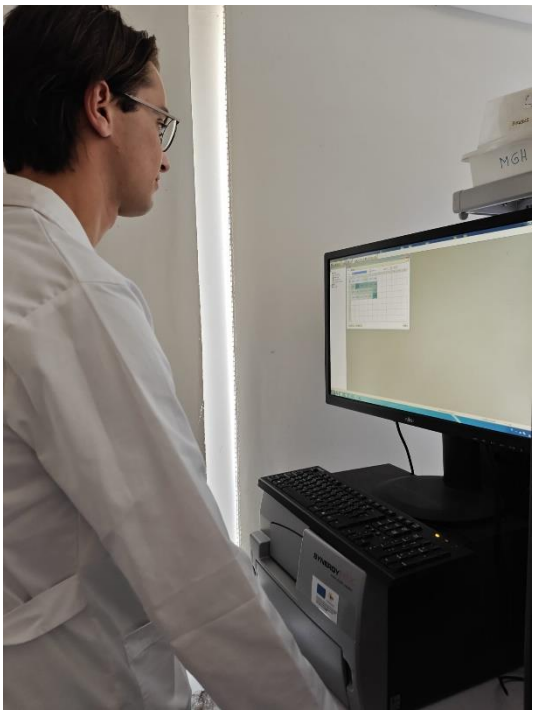
In addition, João Borges has been doing a short-term on-site training activity at TU/e, focusing on the synthesis and development of supramolecular co-assemblies and their advanced characterization via circular dichroism (CD), cryo-transmission electron microscopy (TEM), small angle X-ray scattering (SAXS), and rheology. In addition, João got fully integrated in the scientific acitivites of both E.W. "Bert" Meijer and Patricia Dankers' research groups. He attended the science day of Patricia Dankers' group and engaged in fruitful exchanges and scientific discussions that are expected to lead to joint research projects and new collaborative efforts in short-term fully aligned with the SUPRALIFE's aims.

Also, the PhD student Maria Lopes and the researcher Maria Clara Gomes, both from the UAVR, have started recently their short-term on-site training activities at TU/e under the supervision of E.W. "Bert" Meijer and Patricia Dankers. Maria Lopes has been focusing on the preparation of layer-by-layer films and free-standing membranes, and their advanced morphological and mechanical characterization. Also, the imaging of free-standing membranes with seeded cells is ongoing via high-throughput confocal microscopy aiming to study cell-membrane and cell-cell interactions at the nanoscale level. On the other hand, Maria Clara Gomes has been focusing on the preparation of microparticles and their morphological and mechanical characterization. Also, the imaging and analysis of several markers within microparticle-cell aggregates via high-throughput confocal microscopy is ongoing.

This experience will provide them with invaluable knowledge and hands-on training in cutting-edge techniques at the interface of supramolecular and polymer chemistry, and biomaterials science. Their stay marks the start of a new phase of collaboration in-between UAVR and TU/e, reinforcing the consortium's commitment to fostering international exchange, interdisciplinary learning, and the development of next-generation supramolecular biomaterials and systems for biomedical and healthcare applications.

In addition, Bram Bakker, a PhD student in the Patricia Dankers' research group at TU/e, has been doing a short-term on-site training activity at UAVR. He has been working on the molecular design, synthesis and development of dynamic, robust and bioactive supramolecular polymer-protein hybrid hydrogels as platforms for 3D cell culture. Several crosslinking mechanisms are being investigated aiming for the most stable hydrogels. In addition, the physicochemical, mechanical and morphological properties, as well as the *in vitro* biological performance are ongoing. The goal is to produce hydrogels with enhanced properties when compared to either native supramolecular polymer- or protein-based hydrogels and to expand the cell culture possibilities of supramolecular polymers.



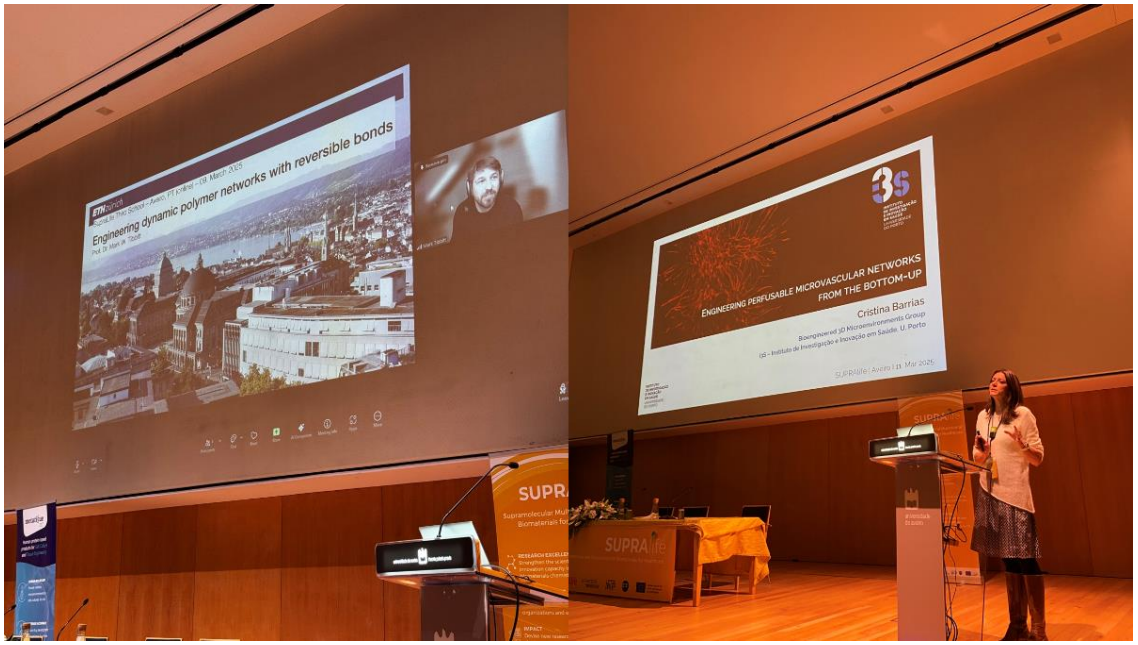


Both the staff exchanges/visits and the short-term on-site training activities launched the seeds for strong and long-lasting scientific collaborations among the consortium partners which will be crucial for the successful implementation and long-term impact of the SUPRALIFE project.

SUPRALIFE THIRD SCHOOL AT THE UNIVERSITY OF AVEIRO | AVEIRO, PORTUGAL | 9-14 MARCH 2025

The Third School of the SUPRALIFE project entitled "Supramolecular Multifunctional Biomaterials" took place at the UAVR, Portugal, from March 9 to 14, 2025.

This event included an excellent scientific program featuring twelve plenary lectures delivered by distinguished scientists from eight European countries: E.W. “Bert” Meijer (Eindhoven University of Technology, The Netherlands), Mark Tibbitt (ETH Zurich, Switzerland), Matthew Baker (Maastricht University, The Netherlands), José Carlos Rodríguez-Cabello (University of Valladolid, Spain), Elisabeth Garanger (University of Bordeaux, France), Aránzazu del Campo (Leibniz Institute for New Materials, Germany), Anna Rising (Karolinska Institute, Sweden), Sandra Camarero-Espinosa (POLYMAT, Spain), Sander Wezenberg (Leiden University, The Netherlands), Sandra Van Vlierberghe (Ghent University, Belgium), Laura De Laporte (Aachen University, Germany), and Cristina Barrias (Institute for Research and Innovation in Health, University of Porto, Portugal).



The lectures focused on topics including dynamic, adaptive, self-healing and injectable polymeric hydrogels; (multi)stimuli-responsive soft biomaterials; 3D and 4D (bio)printed multifunctional (bio)materials; multiscale/hierarchical biomaterials; bioinstructive surfaces and structures; biomimetic and bioinspired supramolecular structures and molecular systems; and their use in nanomedicine, drug/therapeutics delivery, biosensing, tissue engineering or regenerative medicine.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The scientific program also included oral and poster presentations by PhD students and early-career researchers, with over 112 participants. Awards were given for the best oral presentation (Cátia Monteiro, University of Aveiro, Portugal), sponsored by Metatissue, a spin-off of the University of Aveiro, and for the three best posters (Hugo Brummer, University of Groningen, The Netherlands; Chloé Manseau, University of Bordeaux, France; Andreia Malafaia, University of Aveiro, Portugal), sponsored by the scientific journals, *Journal of Materials Chemistry B, Biomaterials Science, Chemical Communications and Materials Advances* from the Royal Society of Chemistry, UK.

The scientific program also included an activity entitled "Meet the Mentor", where plenary speakers were invited to share their career paths and research experiences, as well as interact with and answer young scientists' questions in an informal setting over lunch time.

The event also hosted a soft transferable skills training program which featured twenty-seven invited speakers and over 345 registered participants. This program aimed to support capacity building, professional development, and career advancement for students and early-career researchers, regardless of their field of study or research domain. It included workshops and panels on topics including job hunting in science; CV clinics/coaching; roads to leadership; roads to success; strategies for success; networking and career development; the power of volunteering to advance your career; regeneration into action for the greater good; social media for science; innovation and money making; and artificial intelligence tools in practice. This program was developed by the SUPRALIFE project team in collaboration with two other Twinning projects – EPIBOOST (Grant Agreement No. 101078991) and FONDA (Grant Agreement No. 101079134) – and with the ERA Chair project BESIDE (Grant Agreement No. 951389), all of which are ongoing and coordinated by the University of Aveiro.


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This project has received funding from the European Union's Horizon Europe research and innovation programme
under Grant Agreement No. 101079482
EPIBOOST
FONDA


Catarina Custódio
Hugo Prazeres
FONDA

Participants highlighted, as in the first and second schools, the excellence of the event, the opportunity to learn, share their work, and interact with internationally renowned speakers in the field of multifunctional supramolecular biomaterials, as well as the value of the soft transferable skills training program for widen their career perspective and advancing their personal and professional development.

More information about the SUPRALIFE Third School, SUPRALIFE project and upcoming training activities can be found here: https://www.supralife.eu/thirdschool; https://www.supralife.eu.

INTERNATIONAL SYMPOSIUM AT TERMIS-EU CONGRESS 2025 | FREIBURG, GERMANY | 20-23 MAY 2025

The SUPRALIFE consortium participated in the TERMIS-EU Congress 2025, held in Freiburg, Germany, from 20-23 May 2025.

As part of the scientific program, Patricia Dankers (Eindhoven University of Technology, The Netherlands) and João Borges (University of Aveiro, Portugal) chaired our own symposium entitled “Designing advanced bioinspired materials by merging natural macromolecules with supramolecular chemistry”, which featured João Borges as an invited speaker. During his talk, João shared his team efforts on the molecular design, synthesis and development of bioinspired supramolecular materials to interfaced with living systems.

In addition, João F. Mano (University of Aveiro, Portugal) delivered two invited talks focusing on the (i) design of cell compartments towards the development of hierarchical tissue engineering constructs and (ii) human-based protein biomaterials as advanced platforms for 3D cell culture.

In addition to the invited lectures, a series of oral communications selected from contributed abstracts showcased diverse and innovative research across the field. Among these, researchers from the University of Aveiro shared their latest advances in biomaterials and regenerative medicine.

João Rodrigues (University of Aveiro, Portugal) had the opportunity to deliver an oral presentation focused on the development of customized gelatin-based cryogels with cell-adhesion and injectable properties aiming for bone tissue regeneration.

Manuel Pires-Santos (University of Aveiro, Portugal) delivered an oral communication focusing on human protein-based ultrathin membranes to support the self-assembly of cell aggregates for bone tissue regeneration.

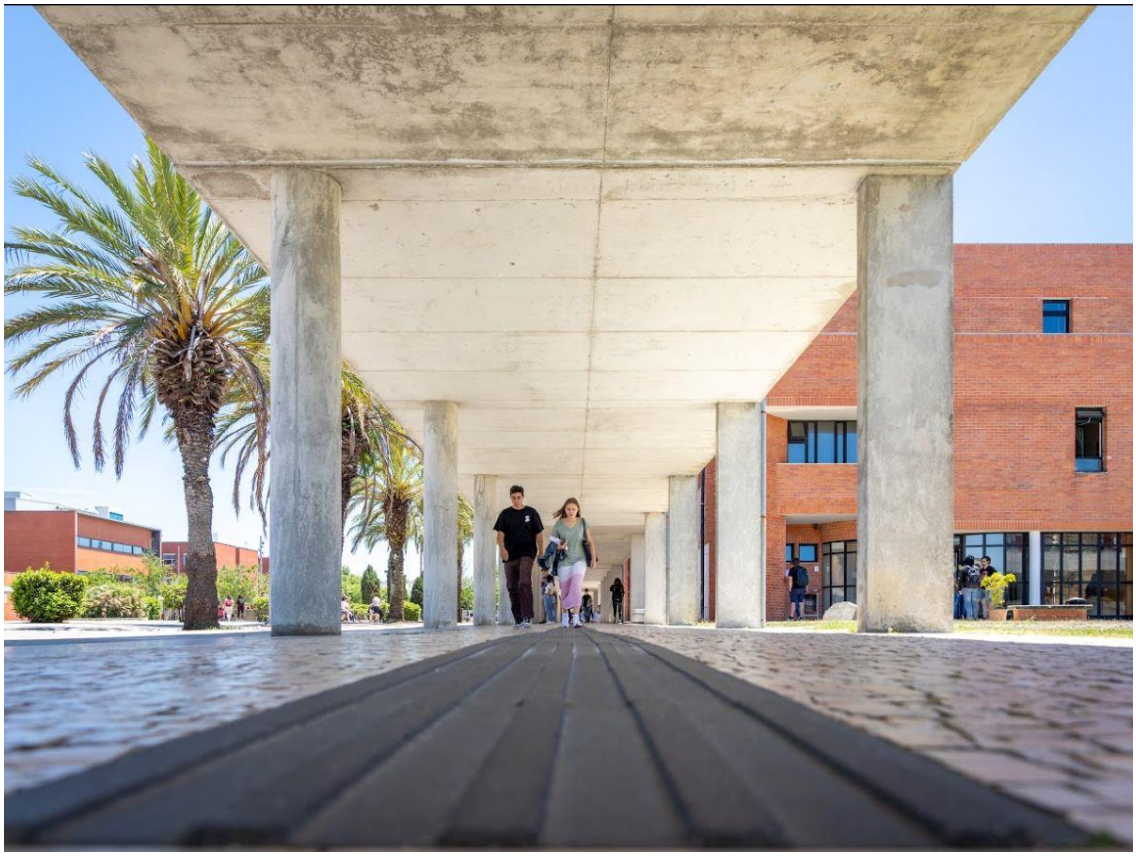
In addition, Bruno Ladeira (University of Aveiro, Portugal) presented an oral communication on the development of injectable systems for cell delivery by applying principles of supramolecular assembly to decellularized human extracellular matrices.

These contributions reflect the innovative work being developed within the SUPRALIFE consortium and the commitment to pursuing next-generation biofunctional materials for tissue engineering and regenerative medicine strategies.

This event was a unique opportunity to share our research, foster meaningful connections, and engage in fruitful scientific exchanges with the broader biomaterials, tissue engineering and regenerative medicine communities, fostering fruitful scientific collaborations and driving progress toward next-generation therapies in tissue engineering and regenerative medicine.

UPCOMING SUPRALIFE'S CAPACITY BUILDING AND TRAINING ACTIVITIES

HANDS-ON WORKSHOP AT THE UNIVERSITY OF AVEIRO | AVEIRO, PORTUGAL | 24-26 SEPTEMBER 2025



We are pleased to announce that the third and final SUPRALIFE hands-on thematic workshop is scheduled to take place at the University of Aveiro, Portugal, from 24 to 26 September 2025. This event follows the successful editions previously hosted by the Eindhoven University of Technology (2023) and the University of Bordeaux (2024), and represents a key milestone in the project's training and knowledge exchange activities.

The workshop will feature invited lectures delivered by experienced researchers, alongside practical hands-on sessions focused on the multi-scale processing and advanced characterization of supramolecular biomaterials and biomedical devices. These activities are designed to share knowledge and expertise, foster interdisciplinary collaboration, and strengthen technical competencies among participants. To enhance the engagement and learning outcomes by the participants, lab-rotation schemes will be implemented.

In addition to its scientific and technical objectives, the workshop will stimulate plenty of networking opportunities among participants and also enable them to get a flavour of the Portuguese culture and academic environment of the University of Aveiro.

SUPRALIFE FINAL INTERNATIONAL CONFERENCE AT THE UNIVERSITY OF AVEIRO | AVEIRO, PORTUGAL | 29 SEPTEMBER-3 OCTOBER 2025

The SUPRALIFE Final International Conference, under the theme "Supramolecular Multifunctional Biomaterials and Systems for Biomedical and Healthcare Applications" will be held at the University of Aveiro, Portugal, from 29 September to 3 October 2025.

The conference will include a strong scientific program consisting of fifteen plenary lectures by world-leading experts in the supramolecular and biomaterials' chemistry fields. The topics to be covered include biomimetic and bioinspired supramolecular systems, functional supramolecular polymers, dynamic stimuli-responsive soft polymeric materials and hydrogels, self-assembled supramolecular (bio)materials and structures, self-assembled multilayered nanofilms, multiscale biomaterials, injectable systems, and bioinstructive surfaces and structures for drug/protein/cell delivery, drug screening, biosensing, theranostics, tissue engineering and regenerative medicine strategies.

The program will also include oral and poster presentations by young scientists selected from contributed abstracts on the aforementioned topics.

Awards will be given to the best oral and poster communications.

The participants will have the unique opportunity to interact closely and exchange knowledge with the plenary speakers, as well as network with peers.

We cordially invite you to attend the SUPRALIFE Final International Conference and we look forward to welcoming and meeting you next September/October in Aveiro in shaping the future of supramolecular biomaterials and systems for biomedical applications and healthcare!

Registration is open at: https://www.supralife.eu/finalconference/#registersection
Please note the early-bird registration deadline is set to **31st July 2025**.

THEMED COLLECTION ON BIOINSPIRED FUNCTIONAL SUPRAMOLECULAR SYSTEMS | JOURNAL OF MATERIALS CHEMISTRY B | ROYAL SOCIETY OF CHEMISTRY | 2025

We are pleased to present an insightful Editorial introducing our *Journal of Materials Chemistry B* themed collection on "Bioinspired Functional Supramolecular Systems". The Editorial has been written by the guest editors João Borges (University of Aveiro, Portugal), Patricia Y.W. Dankers (Eindhoven University of Technology, The Netherlands), Sébastien Lecommandoux (University of Bordeaux, France) and João F. Mano (University of Aveiro, Portugal) and includes 45 peer-reviewed articles, showcasing the latest advancements in the field. This collection provides a broad platform for sharing the latest developments in supramolecular research, from the fundamental concepts on the supramolecular design and synthesis to the application of the bioinspired supramolecular (bio)materials in drug/gene/protein/therapeutics/cell delivery, biosensing, diagnostics, theranostics, tissue engineering, regenerative medicine, among others. In addition, it also aims to encourage more interdisciplinary research and collaborative efforts at the intersection of supramolecular chemistry, (bio)materials science, and biology to inspire breakthrough research in the fascinating field of bioinspired supramolecular systems aimed at more closely emulating the complexity and dynamics of natural biological systems and creating life-like materials/systems.

Find out more about the Editorial and articles published here: Introduction to bioinspired functional supramolecular systems - Journal of Materials Chemistry B (RSC Publishing).

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