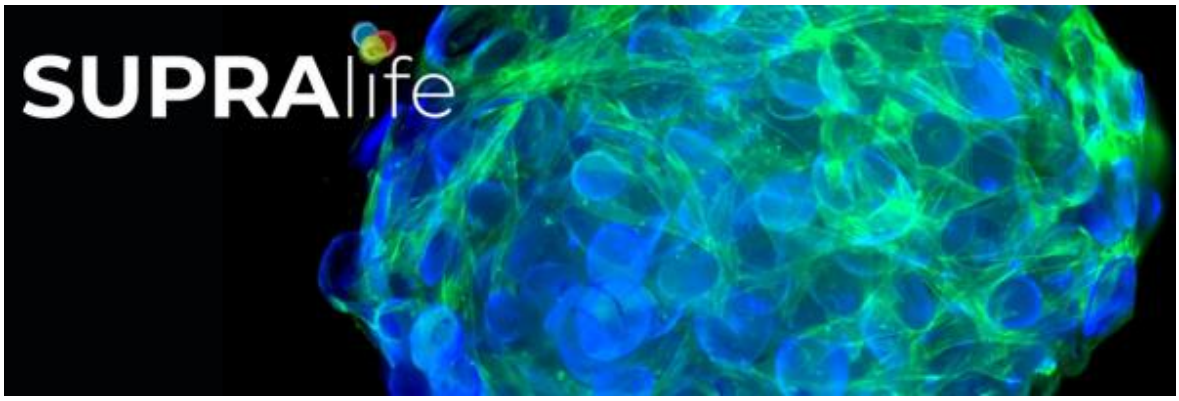


SUPRALIFE NEWSLETTER #1,
JULY 2023

Dear SupraLife Friends and Colleagues,
We are thrilled to share with you the first SupraLife Newsletter. Here you can find information about:

- The SupraLife project, including overview, motivation, objectives and expected impact
- The SupraLife Consortium
- Capacity Building, Training and Networking Activities
- Publications
- Upcoming Events

ABOUT THIS PROJECT

The **SupraLife** project, a Coordination and Support Action Twinning project funded by the European Union's Horizon Europe research and innovation programme, is coordinated by the University of Aveiro (UAVR, Portugal) with the Eindhoven University of Technology (TU/e, the Netherlands), the University of Bordeaux (UBx, France), and its affiliated entities Polytechnic Institute of Bordeaux (Bordeaux INP, France), and the French National Centre for Scientific Research (CNRS, France). UAVR's specializes in the covalent-driven chemical modification of biocompatible and biodegradable marine-origin polysaccharides to develop high added-value sustainable biomaterials/devices for solving challenges in healthcare. However, the performance of either native or covalent-based biopolymer derivatives is limited to the native properties of natural-origin polymers, showcasing limited bioactivity, stimuli-responsiveness, unsuitable mechanical properties, and non-adaptive behaviour, thus extensively limiting their use for mimicking living systems, and fulfilling healthcare needs. **SupraLife** aims to improve the knowledge and expertise of UAVR on the functionalization of biopolymers with self-assembling motifs to develop advanced supramolecular biomaterials and biomedical devices, denoting enhanced structural properties and multifunctionalities, for the benefit of human health.
The short- and long-term objectives of the project include:

- Strengthening the scientific and technological excellence and innovation capacity of UAVR in supramolecular biomaterials' chemistry field and raising the reputation and the research profile of its staff;
- Strengthening the research management and administrative skills of UAVR's staff to successfully compete for internationally competitive research funding;
- Expanding the number of collaborations with internationally leading research organizations and business stakeholders;
- Generating high-quality peer-reviewed scientific publications and intellectual property;

- Devising new research lines and jobs in the long-term to maintain and attract highly qualified researchers in a sustained manner;
- Developing translational biomaterials and biomedical products for healthcare applications;
- Ensuring the long-term sustainability of the consortium and significantly contributing to advancements in the field to have an impact on human health.

For more information about the motivation, objectives and expected impact of the project and consortium, please check the **SupraLife** website, below.

SupraLife Website

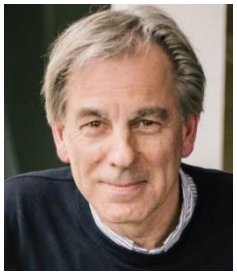
SUPRALIFE CONSORTIUM

UAVR, TU/e, UBx and its affiliated entities **Bordeaux INP** and **CNRS** join efforts to empower a long-lasting collaborative scientific and training network.

Meet the team leading the project:

Dr. João Borges is a Senior Researcher at CICECO – Aveiro Institute of Materials in the Department of Chemistry at the University of Aveiro, Portugal. His research focuses on the molecular design, synthesis, and development of soft supramolecular multicomponent biomaterials to interface with living systems. In particular, he has been developing multicomponent self-assembling biofunctional materials, by combining polysaccharides, self-assembling peptides, and nucleic acids, to be used as bioinstructive matrices to control cell functions and as platforms for controlled drug/therapeutics delivery.

Prof. João F. Mano is Full Professor at the Department of Chemistry at the University of Aveiro, Portugal, and vice-director of the Associate Laboratory CICECO – Aveiro Institute of Materials, where he is directing the COMPASS Research Group. His research interests include the use of advanced biomaterials and cells towards the progress of multidisciplinary concepts to be employed in regenerative and personalized medicine. In particular, he has been applying biomimetic and nano/micro-technology approaches to polymer-based biomaterials and surfaces to develop biomedical devices with improved structural and (multi)functional properties, or in the engineering of microenvironments to control cell behavior and organization, to be exploited clinically in advanced therapies or in drug screening.



Prof. E.W. "Bert" Meijer is Distinguished University Professor in the Molecular Sciences and Professor of Organic Chemistry at the Eindhoven University of Technology, the Netherlands. He is the head of the Meijer lab, specializing in the design, synthesis, and characterization of new functional supramolecular polymers and architectures with unconventional properties and functions. He has been combining the principles of synthetic organic and polymer chemistry with challenges in materials and life sciences towards understanding the fundamental rules of self-assembly and self-organization of molecular architectures into non-covalent functional and complex ordered multicomponent supramolecular materials and structures aimed at uncovering nature's mysteries, and, ultimately, emulate living systems.

Prof. Sébastien Lecommandoux is Full Professor at Bordeaux INP, France, and Director of the Laboratoire de Chimie des Polymères Organiques (LCPO), a joint research unit of the University of Bordeaux, Bordeaux INP, and CNRS. He is the head of the group "Polymer Self-Assembly and Life Sciences", specializing in the design and synthesis of bioinspired polymers that can simultaneously encode supramolecular self-assembly, stimuli-responsiveness and tailored bioactive properties for biomaterials design and tissue engineering applications, especially based on polypeptide, protein and polysaccharide-based amphiphilic block copolymers self-assembly; in the design of polymersomes for drug delivery and theranostics; as well as on biomimetic approaches toward the design of synthetic viruses and artificial cells.

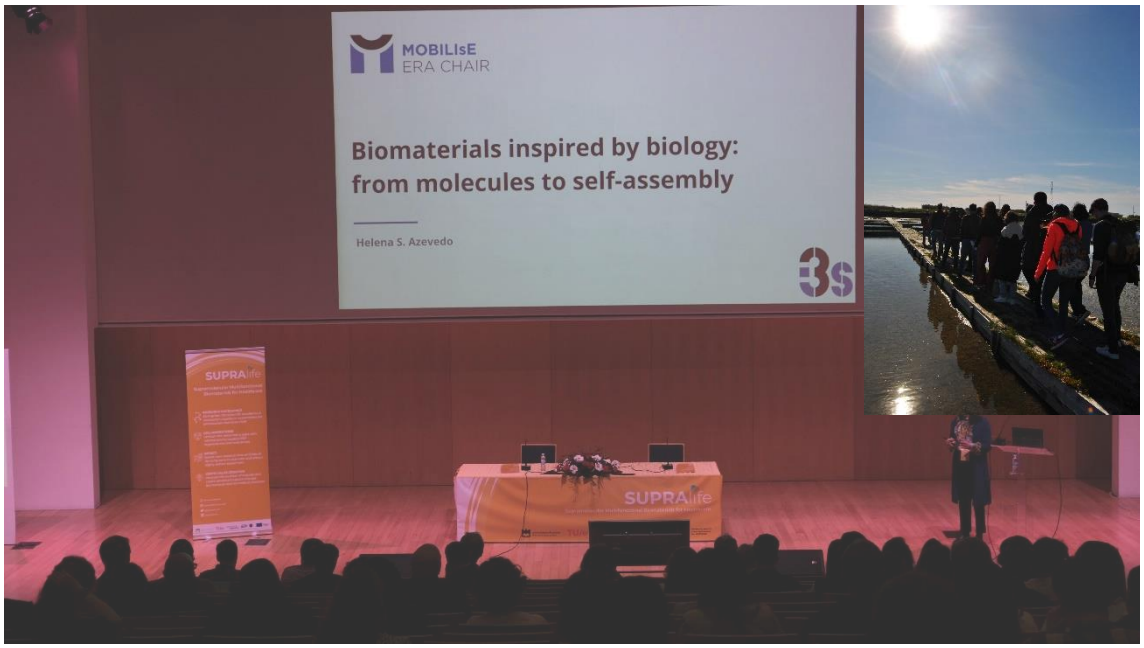
CAPACITY BUILDING, TRAINING AND NETWORKING ACTIVITIES

The **SupraLife** collaborative network will promote the transfer of knowledge and expertise and foster collaborations and networking by organizing a series of yearly capacity building, training and networking activities, including summer school-type events, "hands-on" workshops, symposia in international conferences, scientific retreats, a final international conference, short-term on-site training activities and staff exchanges, and other events devoted to diverse audiences, including the civil society.

SUPRALIFE FIRST SCHOOL | AVEIRO | 19-24th MARCH 2023

The **SupraLife First School** was the very first event organized by the **SupraLife** consortium which took place last March at the University of Aveiro, Portugal. Entitled "*Functional Supramolecular Polymeric Biomaterials*", the event brought together renowned scientists from 8 different European countries who shared their experience and expertise and delivered plenary/tutorial lectures on various topics related to the supramolecular and biomaterials chemistry fields.

The event included poster sessions devoted to students and early-career researchers who could present and share their work and interact with peers and experts. Three best poster awards were given on the occasion. The School also offered workshops on soft transferable skills, including on *grant writing*, *career development*, *science communication*, and *scientific writing and publishing* aiming to advance the professional development and widen the career perspectives of students and researchers to outperform in their professional duties and career paths. This event marked the commencement of the training activities of the **SupraLife** EU-funded Twinning project, which began on January 1st, 2023.


MOBILISE
ERA CHAIR
Biomaterials inspired by biology:
from molecules to self-assembly
Helena S. Azevedo
3S
SUPRAlife


MACROMOLECULES
Thank you
LCP
POL
L'OREAL
MedinCell
SUPRAlife

The **SupraLife First School** also organized a social program to enhance the participants' experience and reinforce the networking in an informal environment. The program included a visit to the renowned Aveiro saltpans "Salinas de Aveiro", where the participants could get to know about the history and explore the fascinating salt pans, as well as enjoy a delightful boat ride on the traditional “moliceiros” boats in the Ria de Aveiro. These enjoyable activities allowed attendees to discover the local culture and natural beauty of the region.

SupraLife First School

INTERNATIONAL SYMPOSIA

We will be organizing a series of symposia in major international conferences in the chemistry and biomaterials fields!

Tanja Weil

Max Planck Institute for Polymer Research, DE

Matthew Webber

University of Notre Dame, USA

Patricia Dankers

Eindhoven University of Technology, NL

Don't miss our *Focus Session* **"Bringing supramolecular materials to life"**, to be chaired by Dr. João Borges (University of Aveiro, Portugal), Prof. Roxanne Kieltyka (University of Leiden, the Netherlands), and Prof. Matthew Baker (University of Maastricht, the Netherlands), **at the 49th IUPAC World Chemistry Congress combined with the 11th edition of CHAINS (IUPAC|CHAINS 2023),** the largest chemistry conference worldwide, to be held in The Hague, the Netherlands from 20-25th August 2023. Join us on August 22nd from 15:10 to 16:40 CEST (Alexia room), for an insightful session on supramolecular polymeric biomaterials for healthcare, and get inspired, exchange ideas and network with world-renowned speakers, namely Prof. Tanja Weil (Max Planck Institute for Polymer Research, Germany), Prof. Patricia Dankers (Eindhoven University of Technology, the Netherlands), and Prof. Matthew Webber (University of Notre Dame, USA). More details about the *Focus Session* can be found here.

Learn more about IUPAC|CHAINS 2023

Mark Tibbitt

ETH Zurich, CH

Still in 2023, we will be at **the 33rd Annual Conference of the European Society for Biomaterials (ESB 2023)** one of the premier biomaterials' conference in Europe, to be held in Davos, Switzerland, from 4-8th September, and will be organizing a symposium entitled **"Dynamic self-assembling biomaterials"** on September 5th from 16:00 to 17:30 CEST. Chaired by Prof. João F. Mano and Dr. João Borges from the University of Aveiro, Portugal, the symposium will feature Prof. Mark Tibbitt (ETH Zurich, Switzerland) as our keynote speaker and will include selected oral communications submitted by participants. Join us in exploring the wonders behind engineering dynamic supramolecular hydrogels and their applications in encapsulation, release, 3D printing, and thermal stabilization of biologics. Stay tuned for the symposium date and keep an eye on our social media channels. Don't miss this opportunity to connect, engage, and network with us at ESB 2023! More information about the symposium can be found here.

Learn more about ESB 2023

Catherine Picart

University of Grenoble Alpes
France

João Borges

University of Aveiro
Portugal

Martina Stenzel

University of New South Wales
Australia

In 2024, we will be at the **12th World Biomaterials Congress (WBC 2024)**, the largest biomaterials' conference in the world, to be held in Daegu, Republic of Korea, from 26th-31st May 2024, with our symposium on **"Self-assembling polymeric biomaterials for healthcare"**. Chaired by Prof. João F. Mano (University of Aveiro, Portugal) and Dr. Zaida Álvarez (Institute for Bioengineering of Catalonia, Spain), the symposium features Dr. João Borges (University of Aveiro, Portugal), Prof. Catherine Picart (University of Grenoble Alpes, France), and Prof. Martina Stenzel (University of New South Wales, Australia), as keynote and invited speakers, respectively. Join us in exploring the molecular design, synthesis, and development, as well as the multifunctional properties of self-assembled polymeric biomaterials for biomedicine, biotechnology, and healthcare applications and discover the latest advancements in nanostructured multilayered films, supramolecular hydrogels, and glycopolymer-based nanoparticles for 3D cell culture, drug delivery, tissue engineering, and regenerative medicine. Don't miss the opportunity to submit your abstract until September 30th and exchange ideas and network with us at WBC 2024. More information about the symposium can be found here.

Learn more about WBC 2024

OUTREACH & PUBLIC ENGAGEMENT ACTIVITIES

Last February, Dr. João Borges (University of Aveiro, Portugal) had the pleasure to engage in science outreach activities by actively participating in the "Meet the scientist" initiative promoted by the Aveiro Fábrica Ciência Viva Science Center. João had the pleasure and a lot of fun sharing the fascinating aspects and the key role of Chemistry in our everyday life, as well as some of the work developed in the framework of SupraLife with children from a primary school from Aveiro.

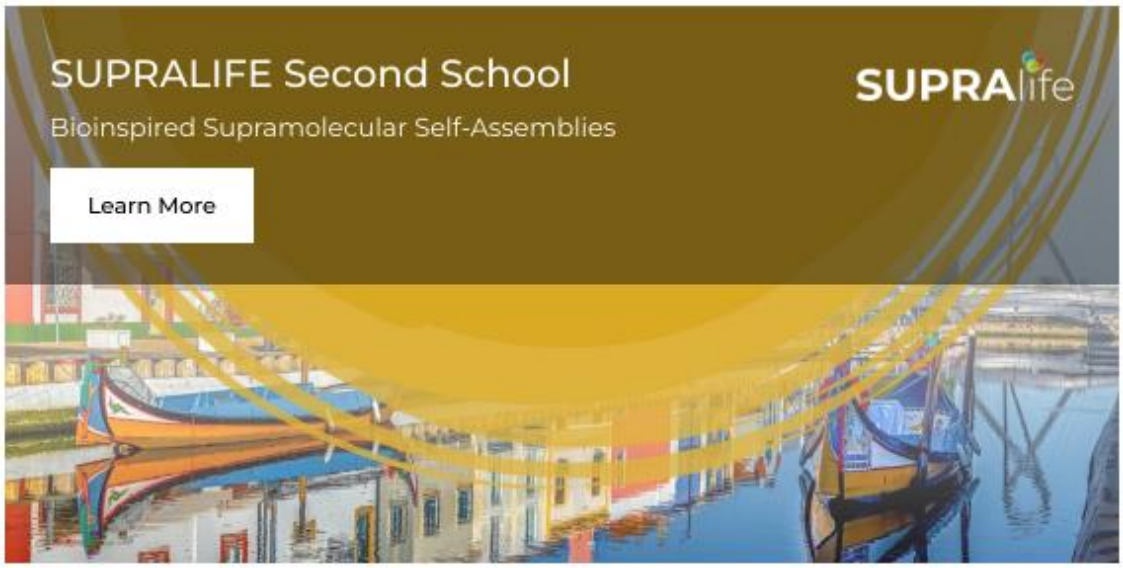
These young minds are the next generation of scientists, and it was a joy to inspire their curiosity and passion for science. The main take-home message was crystal clear: Chemistry is everywhere and vital in our life!

PUBLICATIONS

- Maria C. Gomes*, Ana Rita Pinho, Catarina Custódio, João F. Mano*, Self-Assembly of Platelet Lysates Proteins into Microparticles by Unnatural Disulfide Bonds for Bottom-up Tissue Engineering, *Advanced Materials* **2023**, 2304659. DOI: 10.1002/adma.202304659.
- Cristiana F. V. Sousa, Luís P. G. Monteiro, João M. M. Rodrigues, João Borges*, João F. Mano*, Marine-origin polysaccharides-based free-standing multilayered membranes as sustainable nanoreservoirs for controlled drug delivery, *Journal of Materials* Chemistry B **2023**, 11, 6671-6684. DOI: 10.1039/D3TB00796K (Open Access).
- Vera Sousa, Adérito J. R. Amaral, Edgar J. Castanheira, Igor Marques, João M. M. Rodrigues, Vítor Félix, João Borges*, João F. Mano*, Self-Supporting Hyaluronic Acid-Functionalized G-Quadruplex-Based Perfusable Multicomponent Hydrogels Embedded in Photo-Cross-Linkable Matrices for Bioapplications, *Biomacromolecules* **2023**, 24, 7, 3380-3396. DOI: 10.1021/acs.biomac.3c00433 (Open Access).
- Maria Lopes, Marília Torrado, Daryl Barth, Sofia D. Santos, Melike Sever-Bahcekapili, Ayse B. Tekinay, Mustafa O. Guler, Franck Cleymand, Ana P.

Pêgo, João Borges*, João F. Mano*, Supramolecular presentation of bioinstructive peptides on soft multilayered nanobiomaterials stimulates neurite outgrowth, *Biomaterials Science* **2023**, 11, 5012-5024. DOI: 10.1039/D3BM00438D (Open Access).

- Pedro M. S. Ouro, Dora C. S. Costa*, Adérito J. R. Amaral, João F. Mano*, A Supramolecular Injectable Methacryloyl Chitosan-Tricine-Based Hydrogel with 3D Printing Potential for Tissue Engineering Applications, *Macromolecular Bioscience* **2023**, 2300058. DOI: 10.1002/mabi.202300058.



The **SupraLife Second School** entitled **"Bioinspired Supramolecular Self-Assemblies"** will be held at the **University of Aveiro, in Aveiro, Portugal, from 10-15th March 2024**. It will encompass a strong **scientific program** (10-12th March) which will consist of plenary/tutorial lectures to be delivered by world-renowned scientists (see below) and oral and poster presentations selected from contributed abstracts submitted by participants in fields that include: bioinspired polymers; functional supramolecular self-assemblies; adaptive, dynamic, responsive and interactive soft materials and molecular systems; compartmentalized structures; life-like systems; and their use in nanomedicine, diagnostics, theranostics, biosensing, drug/therapeutics delivery, soft robotics, *in vitro* disease models, tissue engineering or regenerative medicine. This event will also include a **soft transferable skills' training program** (13-15th March) which aims to advance the professional development and widen the career perspectives of students and early-career researchers, irrespectively on their background and research domain. The topics of the training sessions will be announced soon.

Submit your abstract for oral or poster presentation until November 15th, 2023. Don't miss this unique opportunity to share your work, exchange ideas, learn from and engage with renowned speakers and peers, and enjoy an informal and relaxed atmosphere.

We are looking forward to welcoming you in the beautiful city of Aveiro!

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