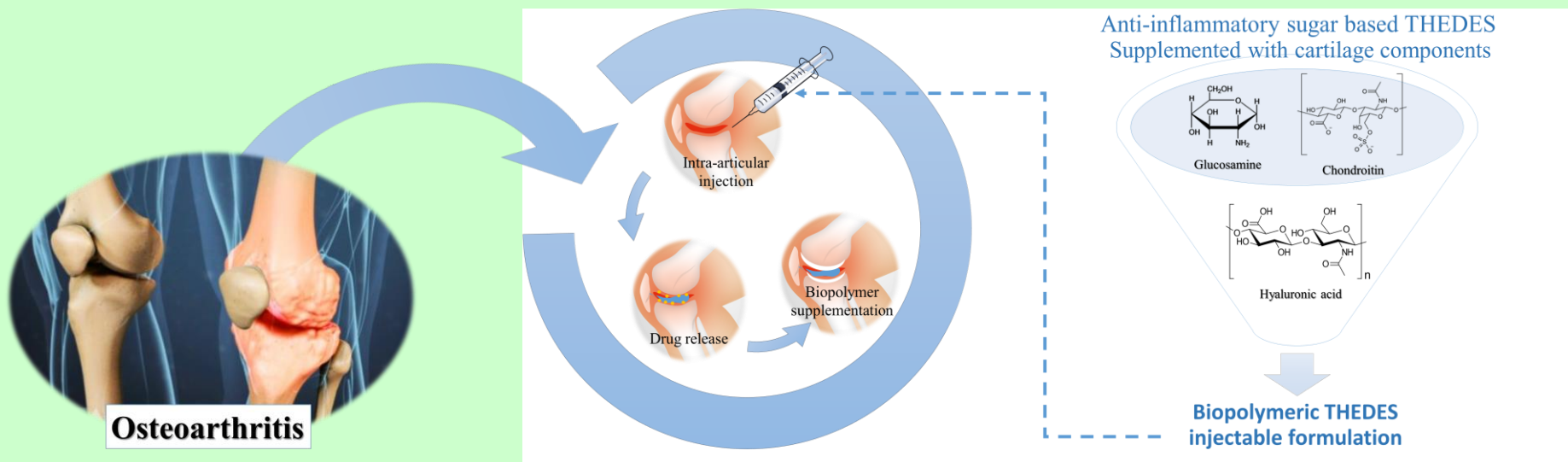




Ongoing work - Glucosamine/Chondroitin-based THEDES for osteoarthritis treatment



Osteoarthritis is a severe condition that causes cartilage thinning and destruction, leading to inflammation, pain and loss of function. Symptomatic therapies include anti-inflammatories and cartilage supplements, namely oral drugs and intra-articular injections, that present drawbacks such as impaired bioavailability, short term effect, time-limited number of applications, and accelerated clear rates. In this context, THEDES can be seen as an alternative, once they can have the following properties: mimic synovial fluid, carry therapeutic components, increase drug bioavailability, present high viscosity and prolonged residence time, ensure retarded/sustained drug release and higher therapeutic dosage. The ongoing work in this area focus on the synthesis, optimization, and characterization of anti-inflammatory sugar based THEDES, that can be supplemented with cartilage components and create biopolymeric THEDES injectable formulations.



NOVA STEAM Academy is a Summer School for elementary and high school students, that comprises Science, Technology, Engineering, Arts and Mathematics. In July 2019, Des.solve team members participated in this event, where they taught several groups of students how to prepare two different Deep Eutectic Systems: menthol:lauric acid (2:1) and fructose:sucrose:glucose (1:1:1). This kind of events is very useful to demonstrate what is being done in science and academia and to attract future students to university education and scientific courses.

<https://novasteamacademy.fct.unl.pt>

Participation in conferences

- Natural Products in Drug Discovery and Human Health, Lisboa, Portugal (July 2019)
- 4th International Conference on Ionic Liquids in Separation & Purification Technology 2019, Sitges, Spain (September 2019)
- 2nd Food Chemistry Conference, Seville, Spain (September 2019)
- I Bioactive Natural Products Research Meeting 2019, Lisbon, Portugal (September 2019)
- 2nd International Workshop on Advanced Materials for Healthcare Applications, Funchal, Madeira, Portugal (October 2019)
- Society for Slow Temperature Biology Meeting 2019, Seville Spain (October 2019)
- TERM STEM 2019, Braga, Portugal (November 2019)
- IC3TC 2019 (3rd International Caparica Christmas Conference on Translational Chemistry), Caparica, Portugal (December 2019)

Publications

- "Development of innovative medical devices by dispersing fatty acid eutectic blend on gauzes using supercritical particle generation processes", Materials Science & Engineering.
- "Unveil the Anticancer Potential of Limonene Based Therapeutic Deep Eutectic Solvents", Scientific Reports.
- "Polymer Science and Engineering Using Deep Eutectic Solvents", Polymers.
- "Simple and Global Correlations for the Physical Properties of Deep Eutectic Solvents", Journal of Molecular Liquids.
- "Preparation of Binary and Ternary Deep Eutectic Systems", Journal of Visualized Experiments.
- "A closer look in the antimicrobial properties of deep eutectic solvents based on fatty acids", Sustainable Chemistry and Pharmacy.
- "Therapeutic role of deep eutectic solvents based on menthol and saturated fatty acids on wound healing", ACS Applied Bio Materials.

Des.solve members Liane Meneses, Filipa Santos, Ana Rita Gameiro, Alexandre Paiva and Ana Rita Duarte performed a practical experiment "Preparation of Binary and Ternary Deep Eutectic Systems", which was published in the Journal of Visualized Experiments.

