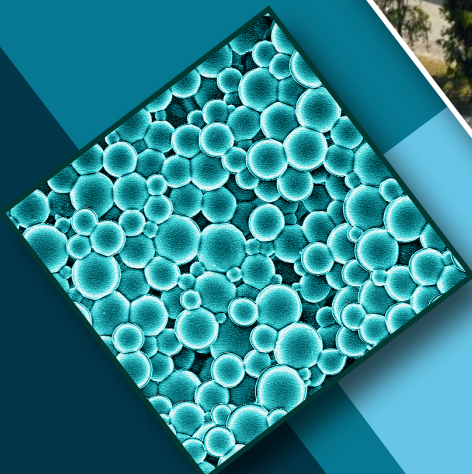


BUSINESS OPPORTUNITIES

Biodegradable and biocompatible
nano- and micro-encapsulation
technologies for microplastic
replacement



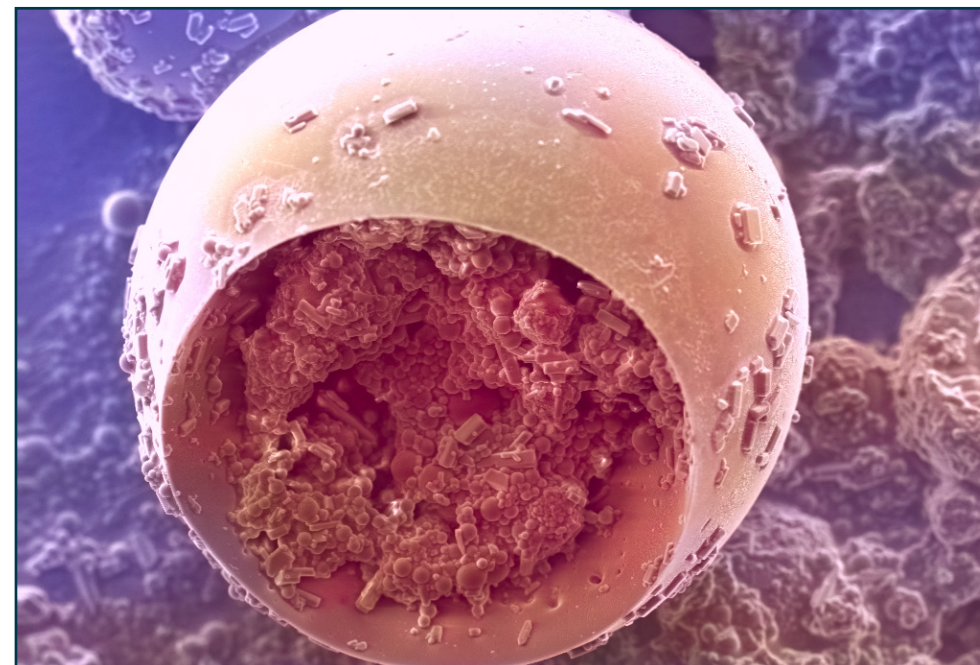
ICN2^R

Institut Català
de Nanociència
i Nanotecnologia

APPLICATION LANDSCAPE AND NEED

Microplastics are a major environmental issue due to their persistence and potential harmful effects on wildlife and human health. The widespread use of non-biodegradable plastic products in various industries such as packaging, textiles, and cosmetics has led to the accumulation of microplastics in water bodies, soil, and food chains.

The urgent need to tackle this problem has led to the search for alternative biodegradable materials that can replace traditional polymeric plastics and reduce their impact on the environment, as recommended by the European Chemicals Agency (ECHA) in the guidelines published in 2019.



INNOVATION

The Catalan Institute on Nanoscience and Nanotechnology (ICN2) has developed novel platforms for the production of biodegradable nano- and micro-particles in which a great variety of active molecules can be encapsulated for application in multiple sectors.

These technologies are customizable, scalable, sustainable (biodegradability in conformity with the OECD guidelines), and they ensure a long-lasting release of the active components in a bio-source delivery system at the optimum time and site for maximum performance.

Rather than conventional plastics, these capsules are made of polymers (or mixtures) from natural or renewable carbon sources. A wide range of materials, both hydrophobic and hydrophilic, can be loaded into them. These technologies provide complete active protection of the encapsulated molecules, minimizing instability and degradation in extreme and demanding conditions.

APPLICATIONS

Nutraceuticals, medicaments, cosmetics, and household products, among others.

KEY ADVANTAGES

- ▶ **Customizable, advanced, and sustainable** technologies
- ▶ **Long-lasting active release** in a biodegradable and bio-source delivery system at the optimum time and site for maximum performance
- ▶ Complete active protection; Elimination of instability and degradation in harsh conditions
- ▶ Fully scaled solution
- ▶ Supports customers in meeting their sustainability goals
- ▶ Combination of biodegradable and renewable carbon source material, delivering long-lasting experience appreciated by both customers and consumers
- ▶ Capsules with more than 60% renewable carbon material and a **biodegradability complying with OECD guidelines**

STAGE OF DEVELOPMENT

Technologies have already been applied in various sectors such as nutraceuticals, medical, cosmetics, and home care.

BUSINESS OPPORTUNITY

The ICN2 is looking for partners interested in research collaboration or license agreements.

Being experts of micro- and nano-encapsulation technologies, we offer our **know-how, facilities and equipment** to help private companies and other research institutions **to develop encapsulation-related products and processes**, including assistance in the **scale-up** of industrial fabrication. We also offer our services for the characterization of nanomaterials.



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