

## ENCAPSULAE

Encapsulae is a technological spin-off of the Spanish National Research Council. The company is committed to development of functional additives for active and intelligent food packaging.



### The problem

The growing population and rapid urbanization have substantially increased the generation of garbage. The World Bank has predicted that the waste worldwide will increase by 70% by 2050, unless urgent measures are taken. The dominant categories of waste are organic waste and plastics. One aspect related to both problems is plastic packaging for the food industry. The packaging industry needs to evolve towards functional, intelligent and sustainable active packaging. Our goal is to contribute to this by designing functional additives that can be added to the polymer to increase food safety. The focus is on two aspects: to control oxidation (directly related to exposure to UV radiation) and the risks of diseases transmitted or transported by food (which is increased in the presence of pests).

Indeed, the existing solutions in terms of compounds aimed at pest control and protection against UV radiation of packaging are very limited, as they are toxic substances, with possible carcinogenic and/or highly polluting effects on the environment. Therefore, our focus is on benign inorganic materials that can be used as safer and more sustainable alternatives.

### Case study objectives

- To develop a new range of functional additives, based on natural components, that provide active solutions to polymeric materials with action against pests, avoiding the use of ecotoxic substances
- To assess how the modified nanomaterials are released from the packaging and transformed throughout the life cycle, thereby affecting exposure and toxicity
- To increase the recyclability of the final product
- To increase the safety and shelf life of food products
- To contribute to food preservation and sustainability by reducing organic and plastic waste

### Materials

- The objectives are addressed through the use of nanomaterials under safe and sustainable designs routes.

