

# NANOPARTICLES LOADED WITH JASMONATE TO FORTIFY AND INDUCE NATURAL DEFENSES IN PLANTS

## Technology for Licensing

### Keywords:

Methyl-jasmonate, calcium phosphate, nanoelictor, nanoparticles, nanocomposites

### Description:

Methyl jasmonate (MeJ) is a plant hormone involved in defense mechanisms, acting as an elicitor, in addition to participating in different plant development pathways. It is a natural and clean alternative to the use of pesticides. However, the low solubility, thermal stability and cytotoxicity of MeJ limits its application, and it can even become toxic.

To overcome these drawbacks, amorphous calcium phosphate (ACP) nanoparticles have been used, a biocompatible and biodegradable material that, once loaded with MeJ, protects the compound against thermal degradation, ensures prolonged retention thereof on the surface of the leaves, and allows a controlled release of the hormone. All this contributes to prolonging its action in the long term, guaranteeing a more efficient treatment in the field.

The preparation method comprises the formation of a precipitate of calcium phosphate nanoparticles, their subsequent suspension in an aqueous medium in which the MeJ is dissolved, with the adsorption of the molecule taking place on the surface of the nanoparticles. The resulting nanocomposite is stable for long periods of time and, furthermore, has shown less cytotoxicity than free MeJ.

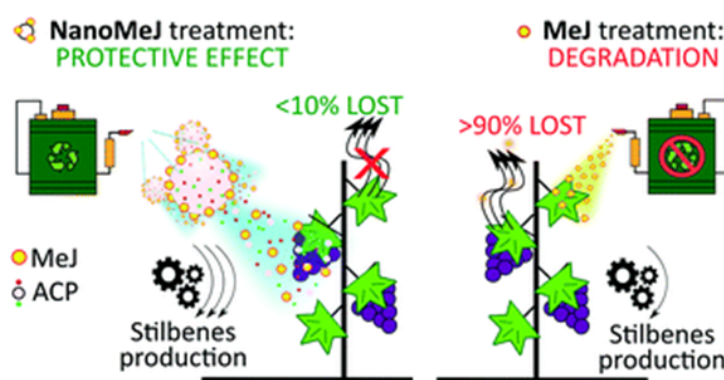
Thanks to the use of these nanoparticles, the frequency of application could be reduced compared to current products, and contribute to the lower use of pesticides, generating a positive impact on many levels.

Actuación en el marco del Proyecto ILIBERIS: Actuaciones Singulares de Transferencia de Conocimiento en el CEI Biotic. Objetivo prioritario OP.01 "Potenciar la investigación, el desarrollo tecnológico y la innovación"

A method for the production of calcium phosphate nanoparticles loaded with jasmonate for the induction of defense mechanisms in plants has been developed. The resulting product allows a controlled release of methyl jasmonate, ensuring efficient and long-term protection.

## Advantages and Benefits

- » Prolonged action  
The nanoparticles ensure a slow and controlled release of the MeJ elicitor
- » Stability  
Nanocomposites are stable for more than 175 days
- » Low cytotoxicity  
The nanoelictor has less toxicity than the free elicitor
- » Natural and clean  
ACP-MeJ Nanoparticles represent an alternative to the use of pesticides, much more polluting and dangerous substances
- » Comfort  
The long duration of the product's action makes it possible to reduce the frequency of its application



**Protective effect of the use of ACP nanoparticles loaded with MeJ compared to the conventional method that applies MeJ in solution**

### Patent status:

European Patent application number: EP21382662.1  
Priority date: 21/07/2021

### Contact:

Oficina de Transferencia de Resultados de Investigación (OTRI) - Universidad de Granada

[patentes@ugr.es](mailto:patentes@ugr.es)

[www.otri.ugr.es](http://www.otri.ugr.es)