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## Encapsulated essential oils in Mesoporous silica nanoparticles to control *Fusarium avenaceum* and its production of enniatins

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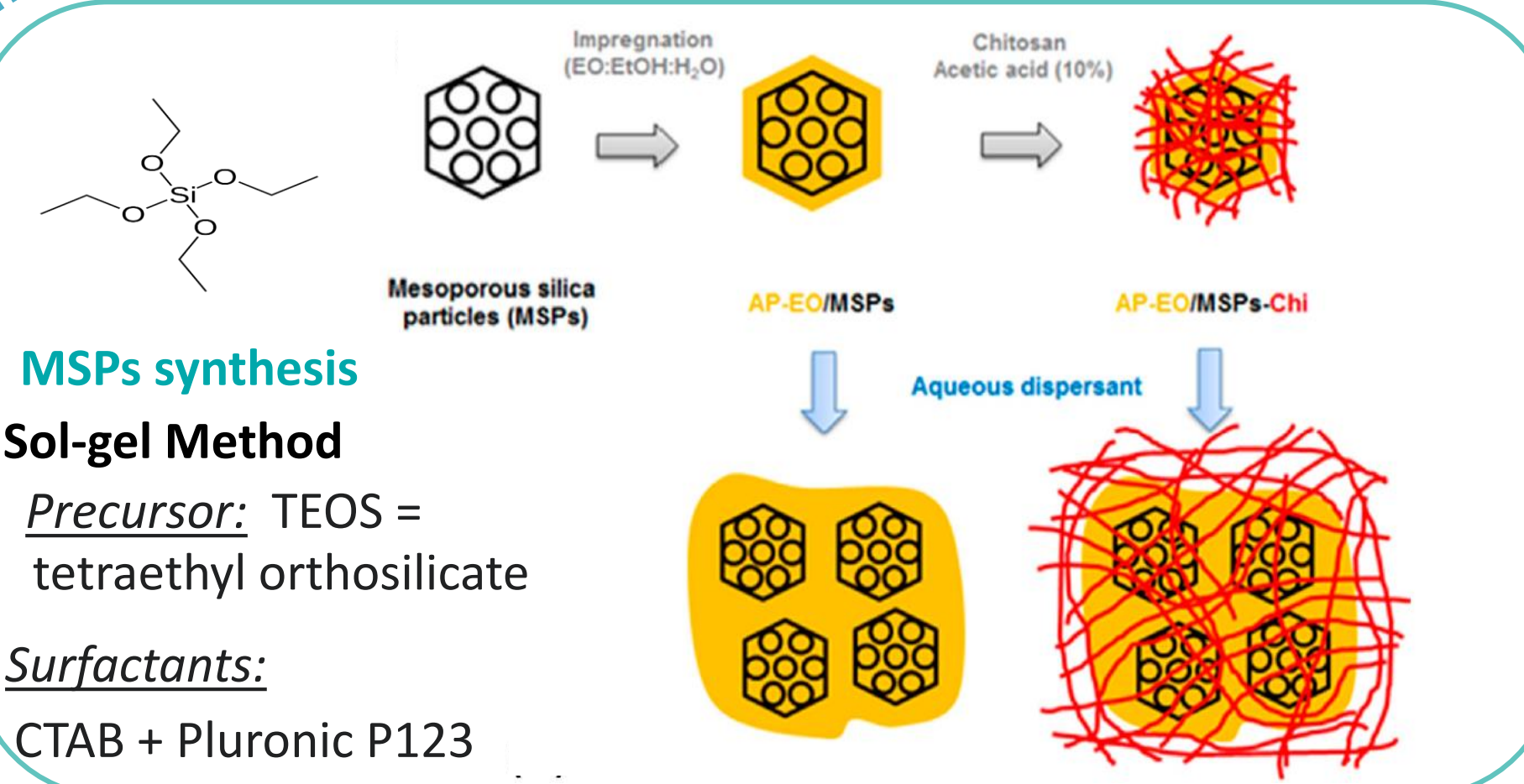
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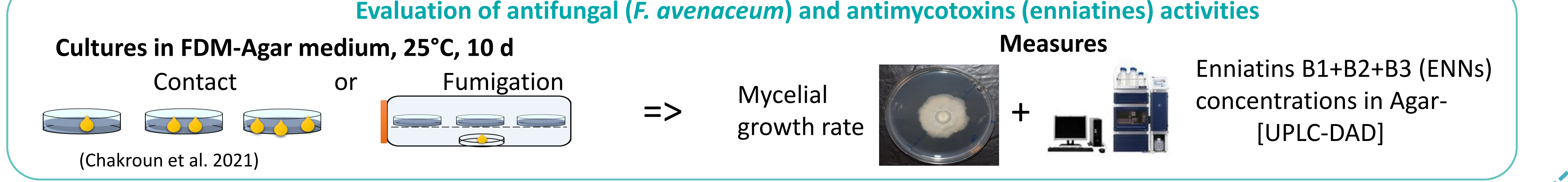
# Encapsulated essential oils in Mesoporous silica nanoparticles to control *Fusarium avenaceum* and its production of enniatins

## Methods

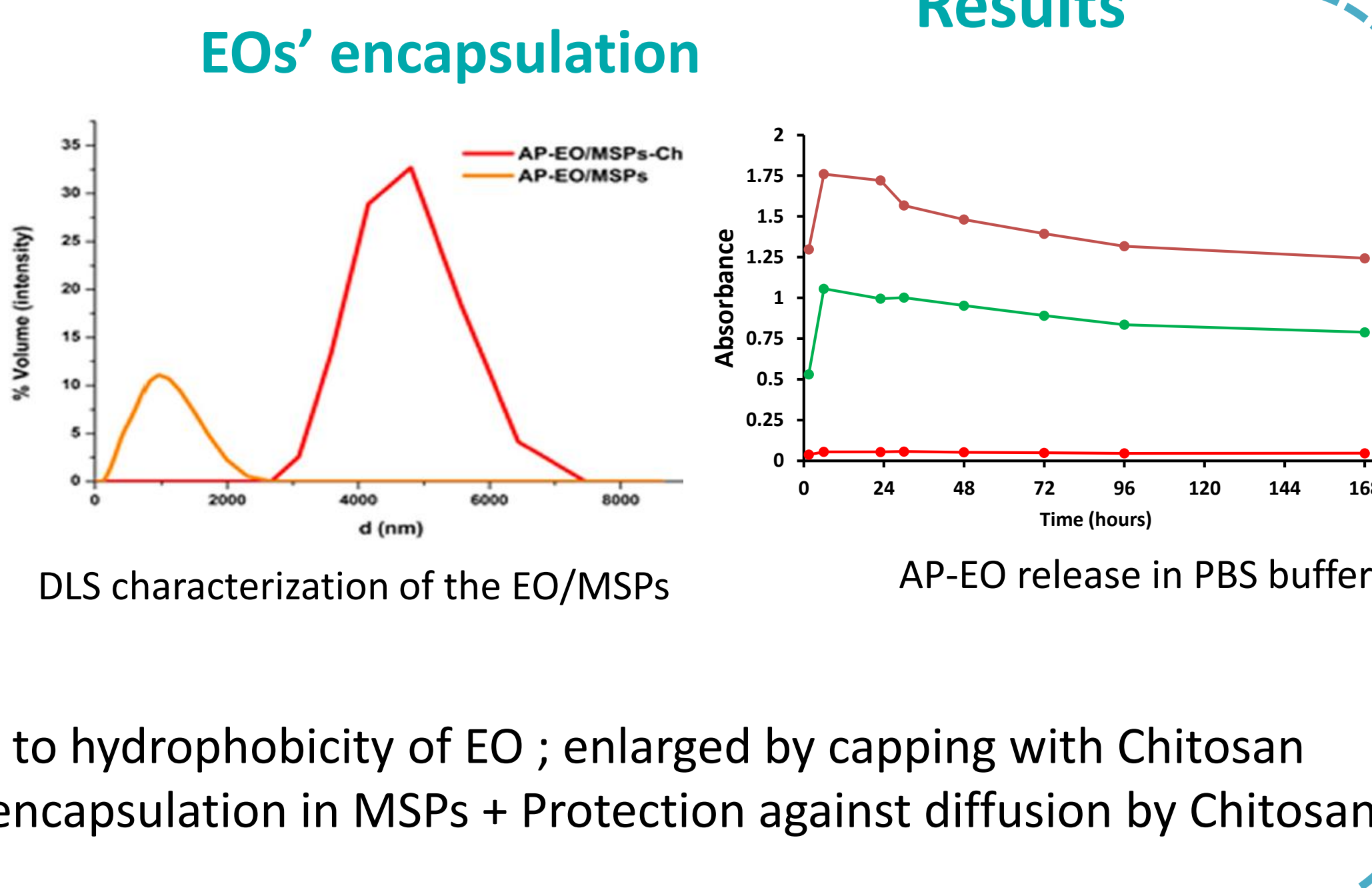
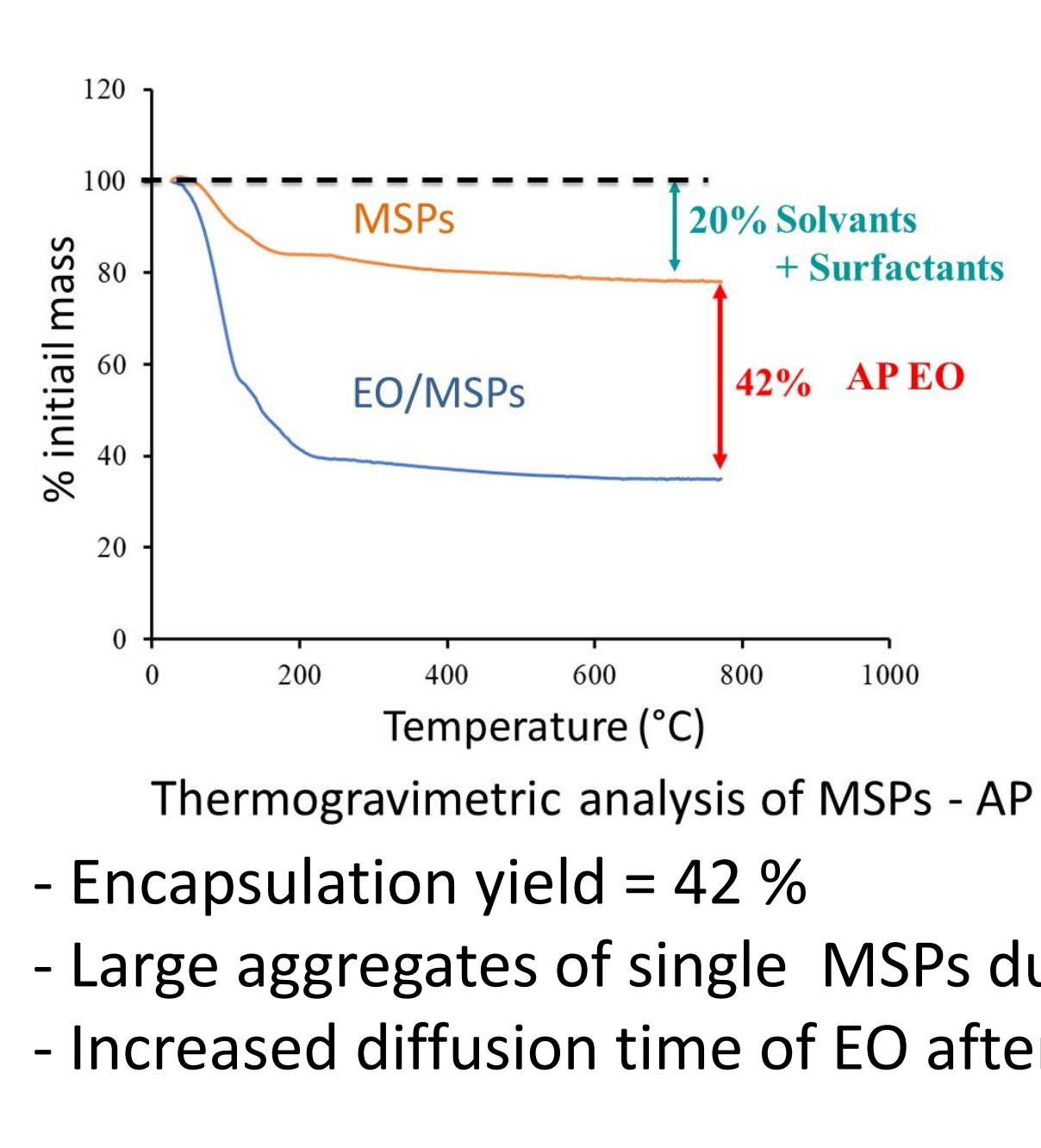
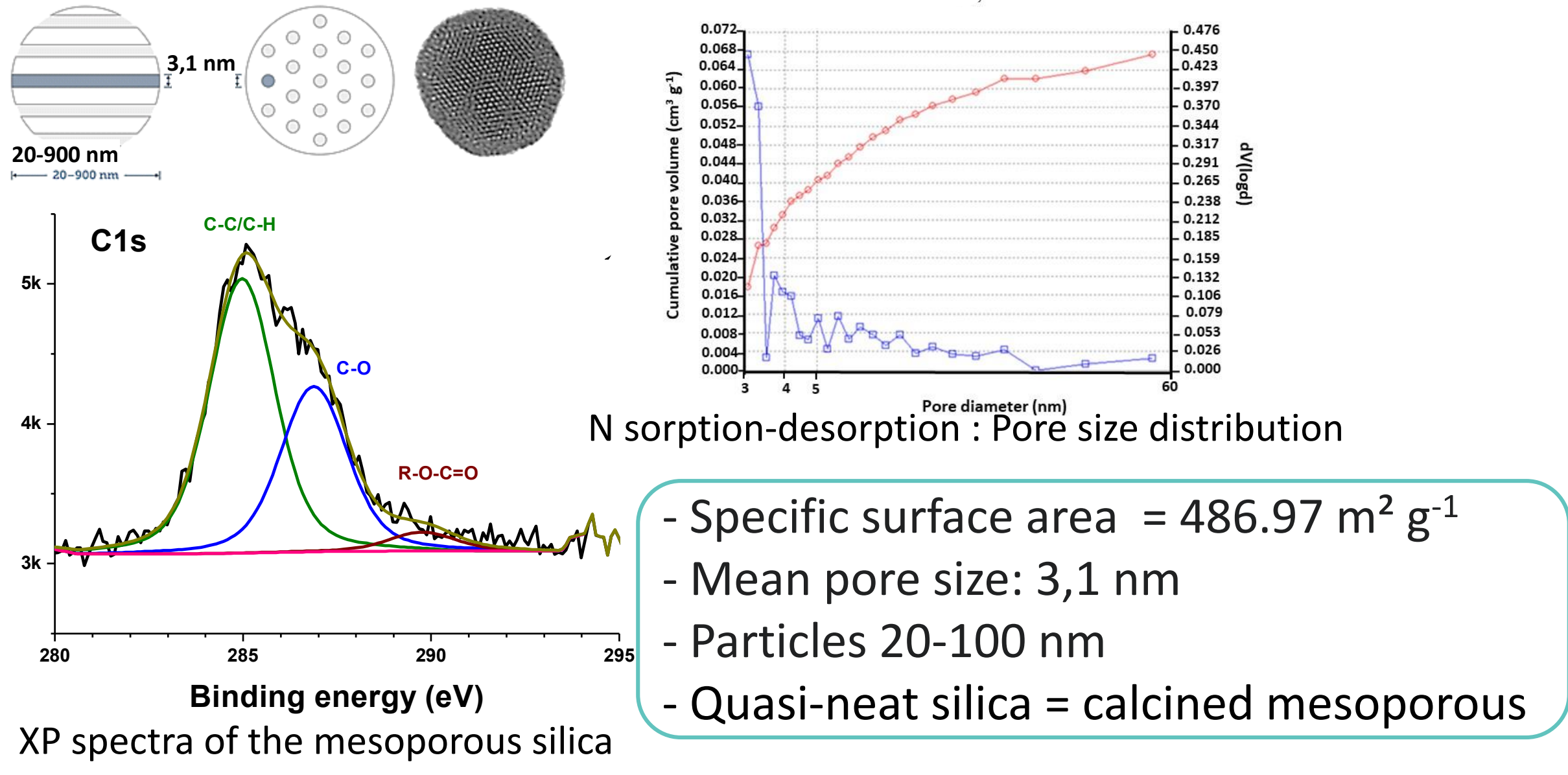


**Impregnation of Essential oil**  
EOs : Hydrodistillation of *Ammoides pusilla* (AP) [aerial parts]  
EOs dissolution in hydroalcoholic solution  
Addition drop by drop to MSPs  
Evaporation of the solvent at 25°C

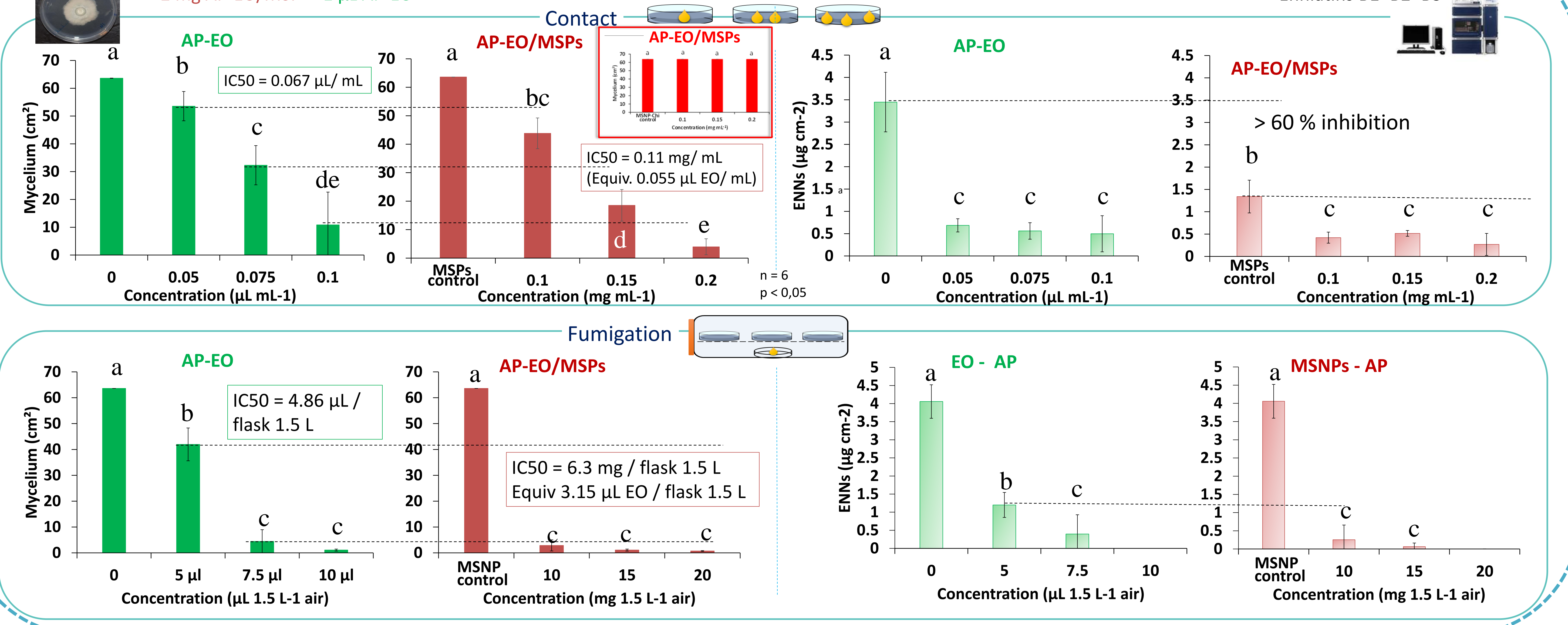
**Caracterisation of the nanoproducts**  
**N2 physisorption measurements at 77K:**  
\* Specific surface area: Brunauer-Emmett-Teller (BET)  
\* Pore size distribution: Barrett-Jorner-Halenda (BJH)  
**DLS Characterization**      **Thermogravimetric Analyse**  
**XPS for surface chemical composition**      **SAXS pattern**  
**In vitro release of EO in liquid and evaporation**



## Mesoporous silica nanoparticles characterization



## Antifungal and antimycotoxin activities



MSPs (without EO) in contact inhibited significantly the accumulation of enniatins by *Fusarium avenaceum*

Encapsulation in MSPs improved the antifungal and anti-enniatiens activity of *Ammoides pusilla* essential oil on *Fusarium avenaceum*

Coating with chitosan improved the shelf life