

Technology Offer

CSIC/AH/046

Treatment to prevent or treat the formation of bacterial biofilms



New nanostructured lipid carriers have demonstrated inhibition of bacterial biofilm formation. They are useful for treating or preventing chronic infections such as those associated with prosthetic implants and recurrent respiratory infections.

Intellectual Property

Priority patent filed

Stage of development

Proof of concept in ex vivo animal model

Intended Collaboration

Licensing and/or co-development

Contact

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Market need

In 2050, bacterial infections will be the leading cause of death worldwide if effective measures are not taken. Bacterial biofilms are 10 to 1000 times more resistant to antibiotics.

The presence of bacterial biofilms is associated with the chronicity of different mucosal infections, such as hidradenitis suppurativa, infections associated with medical devices such as prosthetic implants, and recurrent respiratory infections associated with other pathologies such as chronic obstructive pulmonary disease (COPD) and cystic fibrosis. There is a need for treatments to prevent the formation of biofilms of pathogenic bacteria.



CSIC solution

Nanostructured lipid carriers have been developed that have been shown to inhibit the formation of biofilms of non-typeable *Haemophilus influenzae* (in clinical strains isolated from patients with COPD), *Pseudomonas aeruginosa* and *Chromobacterium violaceum*. The inhibitory effect on bacterial biofilms has also been demonstrated in an ex vivo porcine lung model.

The nanocarriers consist of a lipid core composed of a mixture of solid and liquid lipids and a shell consisting of a layer of surfactant that allows their stabilization in water.

Competitive advantages

- They are more stable than other lipid nanosystems (emulsions or vesicles).
- They do not produce a bactericidal effect.
- They are useful for treating or preventing chronic bacterial infections with the presence of biofilms and also for inhibiting the formation of biofilms on implants or surfaces.
- The formulations are versatile, which allows optimizing their anti-biofilm effect against a broad spectrum of bacterial strains.