

Nanoemulsion-based chitosan nanocapsules as antibiotic delivery system

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The combination of nanoemulsion method and chitosan coating presented in this work has been proved to be a promising strategy to obtain a versatile multi-pocket nanocarrier.

The use of antibiotics produces important side effects, thus reducing the dose of administration and targeting the infection sites are issues of important concern.[1]

Nanotechnology represents an important tool to improve the residence and blood circulation time of the delivered drugs so allowing the reduction of the dose and possibly the side effects.[2,3]

In the past few decades, many kinds of nanocarriers have been developed for delivery and targeting of therapeutic or diagnostic agents for medical treatments, thanks to some important advantages that they offer depending on their physico-chemical properties[4,5]

Different antibiotics active both against MRSA (Methicillin-resistant *Staphylococcus aureus*) and MRTB (Multi-resistant *Mycobacterium tuberculosis*) have been successfully encapsulated in nanoemulsion-based chitosan nanocapsules. In particular, bedaquiline, amikacin, active against *Mycobacterium tuberculosis*, and daptomycin, against *Staphylococcus aureus*.

The encapsulation of the selected antibiotics is reported, in terms of optimization of the drug loading and encapsulation efficiency of the process. The systems obtained have been fully characterized and their antimicrobial effect has been tested, proving the maintenance of the drug activity once the antibiotic is encapsulated.

References

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