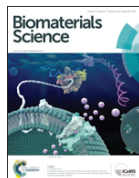


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Nanostructures for protein drug delivery

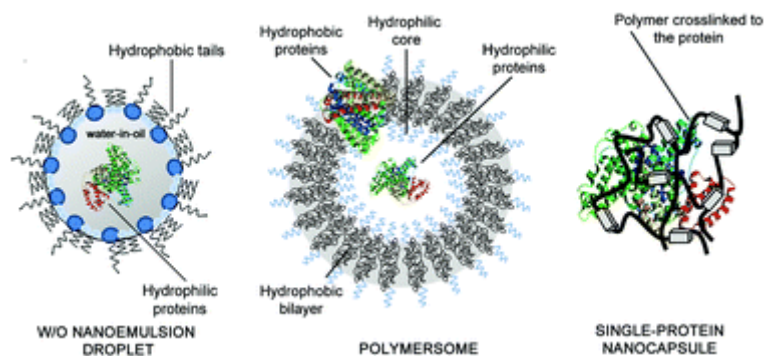
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Abstract

Use of nanoscale devices as carriers for drugs and imaging agents has been extensively investigated and successful examples can already be found in therapy. In parallel, recombinant DNA technology together with molecular biology has opened up numerous possibilities for the large-scale production of many proteins of pharmaceutical interest, reflecting in the exponentially growing number of drugs of biotechnological origin. When we consider protein drugs, however, there are specific criteria to take into account to select adequate nanostructured systems as drug carriers. In this review, we highlight the main features, advantages, drawbacks and recent developments of nanostructures for protein encapsulation, such as nanoemulsions, liposomes, polymersomes, single-protein nanocapsules and hydrogel nanoparticles. We also discuss the importance of nanoparticle stabilization, as well as future opportunities and challenges in nanostructures for protein drug delivery.



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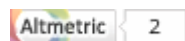
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