

عنوان مقاله:

Designing bilayer lipid encapsulated mesoporous Silica nanostructures : Review on structural and functional features of protocell

محل انتشار:

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خلاصه مقاله:

The word "protocell" refers to lipid bilayer-coated mesoporous silica nanoparticles (LB-MSNs) which have recently come to light as a new-generation cargo transport vehicle that combines the special features of both organic and inorganic components. LB-MSN can regulate biodistribution effectively due to the presence of bilayer encapsulation while high payload capacity was due to the presence of porous nature of silica core. The MSN can be fine-tuned to generate various sizes, shapes, and surfaces while multiple cargos can be easily encapsulated with physical interaction. The bilayer coating avoids the premature release of chemotherapeutics and enhances biocompatibility. The biofunctionalization of protocells provides high colloidal stability and extends surfaces for further modification. The inorganic core can accommodate and surface-engineered multiple classes of biorelevant surface tags for active targeting. The site-specific or organ-specific delivery enhances the reliability of the material while the engineered surfaces could pave a way forward in treating various diseases. The multifaceted review highlights the potential use of bilayer encapsulated MSN for therapeutic delivery and management of multiple diseases.

کلمات کلیدی:

Lipid Bilayer Coating, Mesoporous silica, Protobiont, Protocell, Surface Engineering, Surface Interaction

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