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NEW ERYTHROCYTE-RELATED DELIVERY SYSTEMS FOR BIOMEDICAL APPLICATIONS

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Abstract:

In recent decades, carrier erythrocytes have emerged as a potential alternative to other traditional delivery systems. Research in this field has recently expanded, developing erythrocyte-related systems with interesting improvements to their properties.

A wide range of different structures have been studied, from simple modifications in engineered erythrocyte ghosts to vesicles obtained from them by means of different methods, the so-called nanoerythroosomes. Combinations of these systems with other traditional delivery systems such as liposomes and nanoparticles have also been studied. Furthermore, synthetic structures trying to mimic erythrocyte properties have been obtained with the aim of reaching the unique biocompatibility of these innate biological systems.

Applications of these new systems cover a wide variety of fields as carriers of different types of molecules, from drugs to contrast agents, that can be used in theranostics. Molecules included in these systems can also be stimuli-responsive which presents new and wider opportunities in the vectorization of active molecules such as antineoplastic drugs or contrast agents to specific target organs or tissues.

Nevertheless, these systems are currently in an early stage of development and, although promising, are not yet fully developed and there are still challenges to overcome in their production and complete characterization.

Keywords: drug delivery systems, RBC ghosts, nanoerythroosomes, theranostics

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