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Biocompatibility and Biological Half Life of Liposomes

George Orwell*

Department of Pharmaceutics, University of Tennessee Knoxville, Knoxville, USA,

Commentary

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***For Correspondence:**
George Orwell, Department Pharmaceutics, University of Tennessee Knoxville, Knoxville, USA
E-mail: George@mail.edu.com

ABOUT THE STUDY

Liposomes have been utilised to improve the therapeutic index of new and old medications by changing drug absorption, lowering metabolism, extending biological half-life and decreasing toxicity. The features of the carrier rather than the physicochemical properties of the medicinal ingredient then usage of drug dispersion. Liposomes can be produced from natural or synthetic lipids and liposome contents are not limited to lipids; new generation liposomes can also be formed from polymers. Liposomes, whether made of natural or synthetic lipids or polymers are biocompatible and biodegradable making them suitable for biomedical research.

Liposomes are distinguished by their ability to compartmentalise and solubilize both hydrophilic and hydrophobic molecules. Liposomes has unique properties combined with their biocompatibility and biodegradability make them particularly appealing as drug delivery vehicles. Hydrophobic medications entrap themselves within the liposome's bilayer, while hydrophilic drugs entrap themselves within the aqueous core or at the bilayer interface. Because of changes in bio distribution, liposomal formulations improve medication therapeutic efficiency in preclinical models and in humans as compared to traditional formulations.

Liposome binding medications are intended to be transferred without significant degradation and with few side effects to the target because liposomes are made up of biodegradable, physiologically inactive and non-immunogenic lipids. Furthermore, they have low toxicity and no pyrogenic or antigenic responses. As a result of these qualities, as well as the ease with which the surface may be modified to bear the targetable properties, liposomes are more

preferable molecules for use as drug-delivery vehicles than other drug-carrying systems such as nanoparticles and micro emulsions.

Liposomes were introduced as drug delivery vehicles in the 1970s, but the initial clinical features were unsatisfactory due to colloidal and biological instability as well as inadequate encapsulation of drug molecules. Liposomes are efficient and advanced Nano delivery devices for a variety of physiologically active substances. The ultimate amount of the encapsulated medicine is influenced by the type of preparation used which can produce liposomes of varying sizes and physicochemical features. The trapping of medicines both hydrophilic and hydrophobic into liposomes is utilised to avoid the drug's frequent generic toxicity, which is common in cancer therapies.

As a result, it represents a highly effective approach for enhancing the drug's therapeutic efficacy. Liposome alteration allows for either passive or reactive tumour targeting. This ability causes an efficient medication payload into tumour malignant cells while affecting non-malignant cells minimally.

The advantages and disadvantages of liposome drug carriers are heavily influenced by physicochemical and colloidal properties such as size, composition, loading efficiency, and stability, as well as their biological interaction with cell membranes. There are four ways in which cells and liposomes interact with each other. The most common interaction is either simple adsorption or subsequent endocytosis. Adsorption occurs when attractive forces overcome repulsive forces and this form of interaction is directly dependent on the surface characteristics of liposomes. Liposomes and their contents enter the cytoplasm indirectly through endocytosis delivery. Fusion with cell membranes, or the transfer of liposomal material directly into the cell by the fusion of liposome lipids into the membrane, is much more difficult. The lipid exchange is a long-range contact that involves the transfer of bilayer ingredients such as lipids, cholesterol and membrane bound compounds with cell membrane components.