Research & Reviews: Journal of Pharmaceutics and Nanotechnology e-ISSN: 2347-7857
P-ISSN: 2347-7849

Properties of Liposomes and Significant Impact on How they are Distributed *in vivo*

Richard Merg*

Department of Chemical & Biomolecular Engineering, University of Tennessee Knoxville, Knoxville, USA

Perspective

Received: 30- May-2022, Manuscript No. JPN-22- 68518; **Editor assigned:** 2-Jun-2022, Pre QC No. JPN-22- 68518 (PQ); **Reviewed:** 16-Jun-2022, QC No. JPN-22- 68518; **Revised:** 23-Jun-2022, Manuscript No. JPN-22-68518 (A); **Published:** 31-Jun-2022, DOI:10.4172/23477857.10.1.005.

***For Correspondence:**
Richard Merg, Department of Chemical & Biomolecular Engineering, University of Tennessee Knoxville, Knoxville, USA
E-mail: rechardom@mail.edu

DESCRIPTION

Liposomes can be produced using a variety of techniques. They can differ in size, composition (various amounts of phospholipids and cholesterol), charge (due to the charges of the phospholipids forming them), and structure (multilamellar liposomes consisting of several concentric bilayers, separated by aqueous compartments or unilamellar liposomes, consisting of only one phospholipid bilayer surrounding one aqueous compartment) for a thorough explanation of the chemistry and technology behind liposomes.

The properties of liposomes have a significant impact on how they are distributed *in vivo*. By covalently attaching monoclonal antibodies or other suitable proteins to the outer surface of the liposomes, it is possible to target medications contained in liposomes to specific cells or tissues. Incorporating the phospholipid molecule phosphatidylethanolamine in the phospholipid bilayers is one potential method for creating such immunoliposomes. By exploiting the amino groups of protein molecules, this molecule can be covalently joined to them.

Once supplied to mammals, the majority of typical liposomes naturally undergo phagocytosis. Therefore, one of the *in vivo* uses of liposomes is the control of macrophage function by liposomes. Muramyl Dipeptide (MDP) and Muramyl Tripeptide (MPT), two liposome-encapsulated immunomodulatory compounds, can be utilised to activate macrophages, which can then destroy metastatic tumour cells (for instance, in the liver) and demonstrate an

improved capacity to eradicate diverse pathogens. It is unknown whether the Natural Killer (NK) cells or other cells operate as a conduit for the activated macrophages' ability to kill these cells and germs directly.

On the other hand, some medications that are liposome-encapsulated can be utilised to lower macrophage activity or even totally eliminate macrophages from tissues or organs. Studies aimed at elucidating macrophage functions *in vivo* are increasingly choosing this method.

Using liposomes with lengthy half-lives in the circulation can inhibit or even prevent absorption and clearance by macrophages when liposomes are chosen to function as a depot for medications (storage and gradual release) or when liposomes are intended for targeting of drugs to nonphagocytic cells. By encapsulating liposomes with polyethylene glycol polymers or other compounds that prevent opsonization of the liposomes, one can produce such long-circulating liposomes.

By including cationic phospholipids in the bilayers, cationic liposomes can be produced. Due to the large yield of DNA incorporated, these liposomes may be better suited for gene and antisense treatment. Delivering encapsulated chemicals into the target cells' cytoplasm may be more effective with pH-sensitive liposomes, which destabilise and become fusion-active at mildly acidic pH. The majority of liposomes and the material they are encapsulating typically travel through the lysosomal pathway where it is exposed to a wide range of lytic enzymes.

It needs to be noted that combining different liposomal characteristics may result in a product that is even better suited to meet the needs of, say, precise targeting or gene therapy. Long circulating immunoliposomes are therefore clearly more effective at directing encapsulated molecules to nonphagocytic cells since they are better able to evade the cells of the mononuclear phagocyte system. Additionally, cationic liposomes that are pH-sensitive may be expected to be more effective DNA carriers in gene therapy. Due to their positive charge and pH-dependent behaviour, the later liposomes enable high-yield DNA incorporation and facilitate the release of DNA into the cytoplasm.