**Balasubramanian J, Narayanan N**

1. Shield Health Care Pvt Ltd, Chennai-600095, Tamil Nadu, India
2. Jaya College of Pharmacy, Chennai, Tamil Nadu, India
3. Periyar Maniammai University, Thanjavur-613403, Tamil Nadu, India

*Corresponding author: Periyar Maniammai University, Thanjavur-613403, Tamil Nadu, India, E-mail: jvbalpharm@yahoo.co.in*

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**ABSTRACT**

Niosomes are non-ionic surfactant vesicles acquired on water of artificial nonionic surfactants, with or without development of cholesterol levels or other fats which signify a appealing medication distribution component. They existing a framework just like liposome and hence they can signify substitute vesicular techniques with regard to liposomes, due to the niosome capability to encapsulate different kind of medication within their multiple ecological framework. Niosomes are ideas to be better applicant’s medication distribution as in comparison to liposomes due to various aspects like price, balance etc. Various kinds of medication supply can be possible using niosomes like focusing on, ophthalmic, external, parental, etc.

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**1. INTRODUCTION**

At present no available medication distribution system accomplishes the site specific distribution with managed launch kinetics of medication in foreseeable way. John Ehrlich, in 1909, started the era of growth for focused distribution when he imagined a medication distribution procedure that would focus on straight to infected mobile. Since then, variety of providers were used to carry medication at the focus on organ/tissue, which include immunoglobulins, serum necessary protein, artificial polymers, liposomes, microspheres, erythrocytes, niosomes etc. Among different providers liposomes and niosomes are well recorded mediation distribution. Drug focusing on can be described as the capability to immediate a healing broker particularly to preferred website of activity with little or no connections with nontarget cells. Niosomes or non-ionic surfactant vesicles are minute lamellar components established on admixture of non-ionic surfactant of the alkyl or dialkyl polyglycerol ether category and cholesterol levels with following water in aqueous press. In niosomes, the vesicles developing amphiphile is a non-ionic surfactant such as Period – 60 which is usually stable by inclusion of cholesterol levels and little bit of anionic surfactant such as dicetyl phosphate.

The first review of non-ionic surfactant vesicles came from the aesthetic programs developed by L’Oreal. Use of vesicular (lipid vesicles and non-ionic surfactant vesicles) systems in makeup and for healing objective may offer several benefits. The vesicle revocation is water–based vehicle. This provides high individual conformity in evaluation with greasy dose types. They have an facilities made up of hydrophilic, amphiphilic and lipophilic moieties together and as a result can provide medication elements with a variety of solubilities. You will of the vesicle ingredients are varying and adjustable. Changing vesicle structure, size, utilized amount, surface charge and focus can control the vesicle features. The vesicles may act as a store, launching the medication in a managed way.

Niosomes are one of the best among these providers. The self-assembly of non-ionic surfactants into vesicles was first revealed in the 70s by scientists in the aesthetic market. Niosomes (non-ionic surfactant vesicles) acquired on water are minute lamellar components established upon mixing non-ionic surfactant of the alkyl or dialkyl polyglycerol ether category with cholesterol levels. The non-ionic surfactants type a shut bilayer vesicle in aqueous press based on its amphiphilic characteristics using some energy for example warm, actual physical frustration to type this framework. In the bilayer framework, hydrophobic areas are focused away from the aqueous solution, whereas the hydrophilic leads stay in contact with the aqueous solution. The qualities of the vesicles can be modified by different the structure of the vesicles, size, lamellarity, utilized amount, surface cost and focus. Various causes act within the vesicle, eg, van der Waals causes among surfactant elements, repugnant causes growing from the electrostatic communications among billed categories of surfactant elements, entropic repugnant causes of the head categories of surfactants, short-acting repugnant causes, etc. These causes are accountable for keeping the vesicular framework of niosomes. But, the balance of niosomes are impacted by type of surfactant, characteristics of exemplified medication, storage space warm variety, soaps, use of tissue layer comprising fats, the interfacial polymerisation of surfactant monomers in situ, addition of billed compound. Due to existence of hydrophilic, amphiphilic and lipophilic moieties in the framework, these can provide medication elements with a variety of solubility. These may act as a store, launching the medication in a managed way. The healing performance of the medication elements can also be enhanced by late approval from the movement, defending the medication from scientific atmosphere and reducing results to focus on tissues. Noisome made of leader, omega-hexadecyl- bis-[1-aza-18-crown-6] (Bola-Surfactant)-Span 80-cholesterol (2:3:1 molar ratio) is known as Bola-Surfactant containing noisome. The surfactants used in noisome planning should be eco-friendly, biocompatible and non-immunogenic. A dry product known as proniosomes may be moisturized instantly before use to generate aqueous niosome dispersions. The problems of niosomes such as gathering or amassing, combination and dripping, and provide additional comfort in transport, submission, storage space, and dosing.

Niosomes act in vivo like liposomes, extending the movement of entrapped medication and changing its body submission and metabolic balance. As with liposomes, the qualities of niosomes rely on the structure of the bilayer as well as technique of their development. It is revealed that the intercalation of cholesterol levels in the bilayers reduces the entrapment amount during ingredients, and thus entrapment performance. However, variations in features are available between liposomes and niosomes, especially since niosomes are ready from uncharged single-chain surfactant and cholesterol levels, whereas liposomes are ready from double-chain phospholipids (neutral or charged). The focus of cholesterol levels in liposomes is much more than that in niosomes. Consequently, medication entrapment performance of liposomes becomes smaller than niosomes. Besides, liposomes are costly, and its

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substances, such as phospholipids, are chemical volatile because of their temperament to oxidative degradation; moreover, these need unique storage space and managing and cleanliness of organic phospholipids is varying.

Advantages of niosomes covers:
• They are osmotically effective and constant, as well as they increase the balance of entrapped medication.
• Handling and storage of surfactants needs no special circumstances.
• They improve dental bioavailability of badly consumed medication and improve skin transmission of medication.
• They can be made to achieve the site of action by dental, parenteral as well as exterior tracks.
• The surfactants are eco-friendly, biocompatible and non-immunogenic.
• They improve the healing performance of the medication elements by late approval from the movement, defending the medication from scientific atmosphere and reducing effects to focus on tissues.
• Niosomal distribution in an aqueous stage can be emulsified in a non-aqueous stage to control the distribution rate of medication and provide normal vesicle in exterior non-aqueous stage.

2. FORMATION OF NIOSOMES FROM PRO- NIOSOMES

2.1. Ether Injection Method
In this technique, a remedy of the surfactant is made by dissolving it in diethyl ether. This remedy is then presented using an hypodermic injection (14 evaluate needle) into water or aqueous pressure containing the medication managed at 50°C. Vaporization of the ether results in the development of single padded vesicles. The compound dimension the niosomes established rely on the circumstances used, and can vary anywhere between 50-1000 μm.

2.2. Hand Shaking Method (Thin Film Hydration Technique)
In this method an assortment of the vesicle developing providers such as the surfactant and cholesterol levels are demolished in an unpredictable natural solution such as diethyl ether or chloroform in a circular base flask. The natural solution is eliminated at 70 degrees using a turning evaporator, which results in a slim movie of strong combination placed on the surfaces of the flask. This dry surfactant movie can then be rehydrated with the aqueous stage, with soothing frustration to generate multilamellar niosomes.

2.3. Reverse Phase Evaporation Technique (REV)
This technique includes the development of a remedy of cholesterol levels and surfactant (1:1 ratio) in an assortment of ether and chloroform. An aqueous stage containing the medication to be packed is included to this, and the causing two stages are sonicated at 4-5°C. A obvious gel is established which is further sonicated after the inclusion of phosphate buffered saline (PBS). After this the heat range is brought up to 40°C and stress is decreased to eliminate the natural stage. These outcomes in a sticky niosome revocation which can be watered down with PBS and warmed on water shower at 60°C for 10 minutes to generate niosomes.

2.4. Transmembrane pH gradient Drug Uptake Process
In this technique, a remedy of surfactant and cholesterol levels is created in chloroform. The solution is then disappeared under decreased stress to get a slim movie on the walls of the circular base flask, just like the side trembling technique. This movie is then moisturized using citric acidity remedy (300mM, pH 4.0) by vortex combining. The causing multilamellar vesicles are then handled to three lock up unfreeze periods and sonicated. To the niosomal revocation, aqueous remedy containing 10mg/ml of medication is included and vortexed. The pH of the example is then brought up to 7.0-7.2 using 1M disodium phosphate (this causes the medication which is outside the vesicle to become non-ionic and can then combination the niosomal tissue layer, and once within it is again alkaline thus not enabling it to quit the vesicle). The combination is later warmed at 60°C for 10 moments to provide niosomes.

2.5. The “Bubble” Method
It is a strategy which has only lately been designed and which allows the planning of niosomes without the use of natural chemicals. The effervescent device includes a circular base flask with three neck, and this is in a water shower to management the heat range. Water-cooled flow back and heat range gauge is in the first and second throat, while the third throat is used to provide nitrogen. Cholesterol levels and surfactant are allocated together in a barrier (pH 7.4) at 70°C. This distribution is combined for a interval of 15 a few moments with great shear homogenizer and instantly afterwards, it is bubbled at 70°C using the nitrogen gas to generate niosomes.

2.6. Micro Fluidization
Micro fluidization is a latest strategy used to get ready unilamellar vesicles of described dimension submission. This technique is based on sunken jet concept in which two fluidized sources communicate at super high velocities, in accurately described micro programs within the connections stage. The impingement of slim fluid piece along a common front side is organized such that the energy provided to the system continues to be within the area of niosomes development. The outcome is a higher consistency, small dimension and better reproducibility of niosomes established.

2.7. Multiple Membrane Extrusion Method
Combination of surfactant, cholesterol levels and dicetyl phosphate in chloroform is created into slim movie by water loss. The movie is moisturized with aqueous medication thermplastic membranes solution and the resulting revocation extruded through which are placed in sequence for up to 8 paragraphs. It is a good means for managing niosome size.

2.8. Sonication
A common technique of development of the vesicles is by sonication of remedy as described by Wire. In this technique an aliquot of medication remedy in barrier is included to the surfactant/cholesterol combination in a 10 ml glass vial. The combination is sensor / probe sonicated at 60°C for 3 moments using a sonicator with a titanium sensor / probe to generate niosomes.

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