

Phytosomes: A Modernistic Approach for Novel Herbal Drug Delivery - Enhancing Bioavailability and Revealing Endless Frontier of Phytopharmaceuticals

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Abstract

Phytopharmaceuticals are healing the world from millions and billions of years even though their clinical validation is questioned by virtue of their impediments like low lipid solubility, poor stability, large size moiety and needless metabolism in gut. Phytosome technology has emerged as committed and promising targeting novel drug delivery with improved efficacy, quality and target ability of active plant constituents. Novel herbal formulation techniques have assured the researchers to deliver the plant based secondary metabolites to their systemic targets. This review highlights the unique properties of phytophospholipid complex along with their application in the novel natural drug delivery. Various methods employed in phytosomal preparation and characterization along with the phytosomal advantages over conventional herbal extracts is described in the present review. The prospectus of phytosome technique can suggest new directions and endless frontier as novel drug regimen.

Keywords

NDDS; Phospholipids; Phytosome; Bioavailability

Introduction

Phytomedicine are accepted as natural healers in the whole world and were even used by lords in divine era. Advanced herbal drug delivery system such as phytosomes has demarcated the undefined bioavailability of lipid insoluble secondary metabolites [1]. Lipid insoluble herbal extracts

can be redesigned into lipid compatible therapeutic candidate by chemically assimilating herbal extracts into phospholipids in specific ratio [2]. Cellular vesicles produced by phytosome technique prevent destruction of water soluble phytoconstituents such as terpenoids, glycosides, flavonoids and phenolics by gastric secretion and microflora of gut [3]. Numerous advantages of phytosome such as hepatoprotective action, reduced dose to produce desired therapeutic effect [2] improved stability due to chemical linkage, ability to permeate through skin [4,5] systematic targeting to transit from hydrophilic to lipophilic environment has revolutionized the phytomedicine industry. Nano size of Phytosomes has resolved the obstacles originating due to poor solubility and permeability of large size hydrophilic phytoconstituents across biological membranes [6]. The present study overlooked on phospholipids based drug administration can enlighten modern pathways in the formulation of novel herbal dosage forms.

Anti-solvent precipitation process

Specific amount of herbal extract and phospholipids is refluxed with 20 ml of organic solvents such as acetone at specific experimental conditions below 50°C for 2-3 h. The reaction mixture is concentrated to minimum volume up to 10 ml and then on addition of solvent with low polarity such as n-hexane with stirring, precipitates are obtained. Filtered precipitates are stored in desiccators. The dried precipitates are pulverized and powdered complex are stored in dark amber colored glass bottle at room temperature

Rotary evaporation process

Specific weight of herbal extract and phospholipids were mixed in 30 ml water miscible organic solvent such as acetone in round bottom glass container followed by stirring

for 2 hours at a temperature less than 50°C in rota evaporator. Antisolvent such as n-hexane can be added to thin film which is obtained after uninterrupted stirring using a stirrer [15]. Precipitate of phytosomes so obtained can be stored in amber colored glass container at controlled temperature under specified humidity.

Safe and synergistic

Additives used in the phytosome formulation are approved ensuring it as safe and secure concept as phosphatidylcholine used in complexation is essential part of cell membrane. Synergistic effect has been observed on complexation with hepatoprotective drugs as phosphatidylcholine itself possess hepatoprotective action. Synergistic advantages are vividly seen in protecting the skin against exogenous or endogenous toxin in stressful environmental conditions. Phytosome concept assures increased duration of action at low dose with low risk profile due to upgraded absorption of the active constituent.

Conclusion

Phytophospholipid complex technique has evolved as advanced frontier aspect in defining systemic absorption of herbal extracts. This technique has effectively resolved the irrational queries of plant based drugs. Aimed with predetermined lipid penetration at higher concentration with sustained and constant therapeutic levels in plasma, allows more quantity of active biomarkers to reach at desired site of action. However, it needs more emphasis including complete characterization with optimization, quantitative and qualitative exploration the lipid based system and its impact in different pathological states. However these novel complexes can act as reliable candidates for improved drug dosage therapy. As seen phytomedicines have been healing the world long back time and presently have major acceptance. Initially the phytosome complexes as used in cosmetics, but they are now widely utilized in therapies such as antioxidants, cardioprotective, antiinflammatory, liver protective, antitumor and anti-cancer. With this emerging formulation tool phytosomes has re-explained the relevance of herbals in modern drug targeting approaches.

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