The release of perillyl alcohol from the different kind of vehicles

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Terpenoids are the largest group of natural bioactive compounds exhibiting multiple nutriceutical activities, they are also known as active cosmetic ingredients [1]. They exhibit unique biological and pharmacological activities such as: anti-inflammatory, antimicrobial, antiviral properties, cytotoxic effects, against cancer and cardiovascular diseases [2].

One of the promising anticancer monoterpene is perillyl alcohol (POH). Peryllil alcohol is isolated from the essential oils of lavende, peppermint, spearmint, cherries and several other plants. So far published studies have indicated that topical application of POH may improve a skin cancer chemoprevention therapy [3]. In animal studies it has been shown to be therapeutic for pancreatic, mammary and liver tumors. It has also been shown to inhibit photocarcinogenesis and UVB-induced skin carcinogenesis [4]. Moreover perillyl alcohol exhibits chemopreventive properties for colon, skin, breast and lung cancer. Its activity is associated with a selective inhibition of isoprenylation of oncoprotein P21, which regulates cell division [5].

A review of the literature shows that there are very few information concerning the release of perillyl alcohol. Gupta et al. [6] were working on determination the influence of several factors on the stability of POH in solution and develop a topical formulation of POH. Farazudin et al. [7] obtained a novel poly-lactic glycolic acid(PLGA)-based microparticle formulation of perillyl alcohol.

The aim of this work is to study the release kinetic of perillyl alcohol from the various kind of vehicle (oil, macroemulsion, gel, nanoemulsion, NLC) using the selected mathematical models. The aim of this work is also reference the physicochemical properties of obtained formulations to the process of bioavailability of the carrier from the group of monoterpenes with antitumor activity.

Macroemulsion, nanoemulsion and nanostructured lipid carriers contained Polysorbate 80 as emulsifiers and caprylic/capric triglyceride as the oils phase. The water – glycol gel was stabilized by carbomer. The active release study of the actives was carried out using the Spectra/Por Standard Regenerated Cellulose (RC) membrane, at the temperature T=32^{o}C. The concentration of active agents in the receptor solution was analyzed by HPLC analysis. The results have shown that nanoformulations are the promising carriers for controlled release of perillyl alcohol. The physicochemical properties of obtained formulations have a high impact on the mechanism of drug release process.

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