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Advancement of All-Trans Retinoic Acid Delivery Systems in Dermatological Application

[Cosmetics](#) • [Review](#) • [Open Access](#) • 2022 • DOI: 10.3390/cosmetics9060140

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Abstract

Dermatological conditions, such as acne, photoaging, psoriasis, and wounds, have been treated topically with all-trans retinoic acid (ATRA) for many years owing to its anti-inflammatory activity, comedolytic effect, and ability to increase collagen production. However, common side effects of ATRA known as the retinoid reaction can occur. These side effects are countered by ATRA encapsulation in solid lipid nanoparticles (SLN), nanostructured lipid carriers (NLCs), and liposomes. Liposomes used to encapsulate ATRA include niosomes, ethosomes, and transfersomes. Side effects involving inflammatory reactions, such as irritation, redness, and erythema, were diminished using these approaches. The use of such carriers enhanced the efficacy of ATRA by enhancing its permeation into skin. These formulations have been compared in terms of improving the activity of ATRA and the ability to relieve the side effects. Further research into different delivery systems for ATRA using various formulations will improve the future of topical ATRA delivery. © 2022 by the authors.

Author keywords

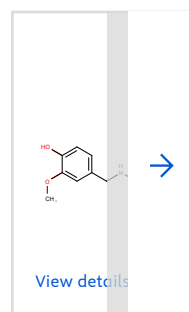
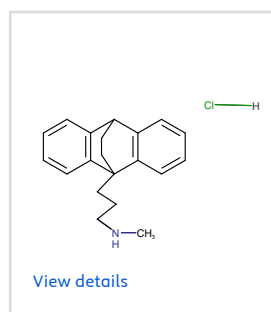
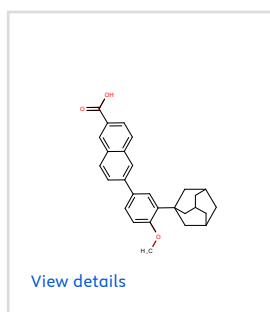
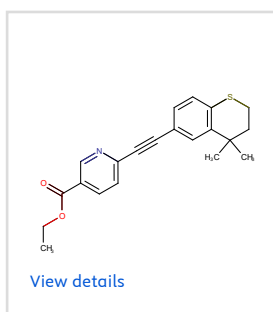
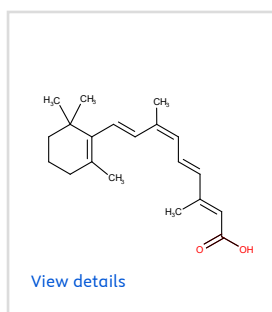
liposomes; NLC; retinoids; retinol; SLN; tretinoin

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