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SKIN CANCER: NEW FORMULATION STRATEGIES FOR TOPICAL TREATMENT

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The incidence of skin cancer is increasing worldwide, with surgical or invasive procedures representing the most widely employed treatments. Since anticancer drugs administered orally or by intravenous route are associated with serious side effects, topical therapy could represent an effective alternative treatment for superficial skin cancer, firstly actinic keratosis (AK) and basal cell carcinomas (BCC). To date, a very limited number of molecules, for both chemotherapy and immunotherapy, have been topically administered to skin cancer lesions. Researchers have focused on developing new drugs and new combination of molecules, such as conventional cancer chemotherapeutics and phytochemical compounds promising as anti-cancer drugs or as lead compounds in the synthesis of new drugs. The physicochemical properties of molecules, such as size and LogP, are important issues in selecting a candidate for topical delivery. In recent years, nanotechnology-based delivery systems have been studied to enhance drug bioavailability in terms of topical drug delivery and skin distribution. Moreover, as the target sites to treat skin cancer are the different skin layers, new drug delivery systems should improve selective tissue distribution into the stratum corneum-epidermis and epidermis-dermis, minimizing side effects and reducing the required dose. Delivery of chemotherapeutic drugs using nanotechnologies, such as nanocrystals and nanocarriers (liposomes, SLNs, polymeric micelles, niosomes, etc.), not only can improve drug stability, but also can increase the local drug concentration by overcoming the stratum corneum, main barrier to penetration. The assessment of the drug penetration profile into the skin layers can be performed with in vitro penetration studies on porcine ear skin, allowing the determination of the amount of penetrated drug within the stratum corneum, epidermis and dermis and hair follicles and the relative penetration depth.

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