Small molecule constituents found in camphor oil can be used as topical therapy for non-melanoma skin cancer

Current non-surgical approaches to non-melanoma skin cancers rely on systemic administration of therapeutics. Attempting to target hyperproliferative cells in the epidermis, these approaches often introduce the risk of severe side effects. To this end, this technology identifies the topical application of camphor oil as a safe and effective therapy for squamous cell carcinoma (SCC). Camphor oil, well-documented as a therapy for numerous health-related problems, provides an agonists for transient receptor potential channel (TRPV3) receptors. These receptors, expressed in squamous cells and influential in cell proliferation and differentiation, are overexpressed in SCC. Further, moderate TRPV3 activation has been found to arrest proliferation and reduce tumor size in preclinical models. This technology identifies components of camphor oil, a safe and efficient therapy for numerous health-related applications, as a low-cost, non-invasive, topical agent for treatment of SCC.

An essential tree oil as a low-cost, non-invasive, topical agent for non-melanoma skin cancer prevention and tumor size reduction

This technology has identified components found in camphor oil that may be active in modulating squamous cell carcinoma via TRPV3. These small molecule constituents, known as terpenes, have been shown to reduce premalignant tumor burden with minimal side effects to neighboring healthy skin. Currently, no SCC therapies focus on TRPV3 activation. The incorporation of terpenes into topical creams and/or solutions may unlock a relatively simple, safe, and localized method for administering an anti-cancer therapy. This technology may also be added to sunscreens and lotions as a prophylactic, directly targeted the cause of the majority of SCC cases, chronic exposure to UV radiation from the sun. Daily use of such creams may provide a significant reduction in the incidence of different types of non-melanoma skin cancers.

Several terpene constituents have been found to significantly reduce premalignant tumor progression in a mouse chemical skin carcinogenesis model.
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Applications:

- Localized treatment of Squamous Cell Carcinoma, avoiding systemic adverse effects
- Pre-surgical reduction of tumor size
- Post-surgical adjuvant tumor therapy
- Prevention of malignancy in precancerous lesions, possibly by incorporation into sunscreens or lotions
- Treatment of other non-melanoma skin cancers such as Basal Cell Carcinoma
- Treatment of Actinic Keratosis

Advantages:

- Camphor oil is a widely used, natural substance that is FDA approved to be applied to the skin
- Reduced toxicity can lead to greater therapeutic window and patient compliance
- All other approved Squamous Cell Carcinoma treatments are systemic and have severe side effects

Patent information:

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