



Intellectual Property Status

Patent Filed

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Licensing and Marketing

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Nanoparticles as Skin Cancer Chemopreventive Agents

Non-Confidential Summary

BACKGROUND

Sunscreens are considered an over-the-counter drug and are regulated by the FDA. Sunscreen is used for the protection of UV radiation contained in sunlight. Over the past several years, awareness of skin cancers caused by sunlight has increased, and more attention is being paid to the importance of sunscreen and how it works. The American Cancer Society, Skin Cancer Foundation, and many other health authorities recommend the use of sunscreen. The top three companies in this market account for an estimated 44.0% of total industry revenue in 2016. Edgewell Personal Care, the industry largest operator, owns leading sunscreen brands Banana Boat and Hawaiian Tropic. Additionally, Bayer AG controls the company that produces Coppertone products, while Johnson & Johnson offers sunscreen through its Neutrogena brand. The global sun care product market is projected to reach \$11.1 billion by 2020 with the largest market being Europe. Growth in the coming years will be driven by the development of more effective sun care formulations featuring natural and organic ingredients.

BREAKTHROUGH IN SKIN CANCER CHEMOPREVENTIVE AGENTS

Researchers at the University of South Alabama have developed the use of nanoparticles in sunscreen and cosmetics for the protection and reversal of ultraviolet (UV) damaged skin cells and melanomas. Using cell culture experiments these scientists had identified that silver nanoparticles protect human keratinocytes against UV radiation-induced DNA damage and apoptosis indicating that silver nanoparticles may serve as a chemopreventive agent that could be added to skin care solutions. In addition, these researchers have identified that the size of the silver nanoparticle is a critical determinant of the UV-protective efficacy of silver nanoparticles in human keratinocytes. Only smaller silver nanoparticles (10-40 nm) were effective in protecting skin cells from UV-induced DNA damage and apoptosis, while no protection was observed when larger silver nanoparticles (60-100 nm) were used. Moreover, these scientists have compared the relative potential of silver, Zinc-oxide and titanium-dioxide nanoparticles against UV-induced DNA damage for the prevention of skin carcinogenesis. Data raise concerns about the safety of using Zinc-oxide and titanium-dioxide nanoparticles and establish superior protective efficacy of silver nanoparticles.

COMPETITIVE ADVANTAGES

- **More effective protection from UV skin damage**
- **Increased repair and reversal of UV skin damage**