

TECH OFFER

Acne And Melasma Treatment Using Ionised Tretinoin



KEY INFORMATION

TECHNOLOGY CATEGORY:

Healthcare - Pharmaceuticals & Therapeutics

Personal Care - Cosmetics & Hair

TECHNOLOGY READINESS LEVEL (TRL): **TRL7**

COUNTRY: **SOUTH KOREA**

ID NUMBER: **TO174988**

OVERVIEW

Tretinoin is a vitamin A derivative under the family of Retinoids which functions by exfoliating the surface of the skin to allow regeneration of the skin epidermis and acts as an anti-aging treatment through reduction of wrinkles fine lines. Tretinoin is the most used substance for acne and photoaging treatment. While retinol is an Over the Counter (OTC) product, Tretinoin is a prescription strength drug with faster regeneration for the epidermis layer compared to retinols which must be converted twice to its active form retinoic acid. The current Tretinoin, though effective, may produce strong and irritation side effects for individuals who are more sensitive with the possibility of a Tretinoin purge escalating an increased initial outbreak before subsiding and reaching a long-term control of acne outbreaks. In the market, moisturizing cosmetics products are mixed with Tretinoin for the purpose of whitening effect which is not ideal.

The technology provider has developed a derivative of Tretinoin, a synthetically modified new compound called Tretinoin Potassium Salt without the side effects of peeling skin and is tested to be more effective and safer than Tretinoin in both efficacy and toxicity. Besides its application in cosmetics, Tretinoin Potassium Salt (potassium all-trans retinoate) has also shown to inhibit

apoptosis and metastasis in neuroblastoma, breast cancer and lung tumors. Non-clinical trials tests were conducted and concluded.

The technology company is seeking for partners to conduct clinical trials for FDA OTC Monograph certification and license Tretinoin Potassium Salt as an active ingredient for cosmetic and pharmaceutical purposes.

TECHNOLOGY FEATURES & SPECIFICATIONS

Tretinoin Potassium Salt has a higher absorption rate and skin residual rate than Tretinoin in a comparative animal application test of the same dose, exhibit improved skin inflammatory protein and related gene inhibitory effect with no eye irritation, and a skin irritation index (P.I.I) of less than 3.

The non-clinical trials include:

1. *In vitro*: Acne bacteria application test, cancer cell (breast cancer & neuroblastoma) MTS cell survival assay, Migration, Invasion
2. *In vivo*: API oral pharmacokinetics (PK)
3. Regulation (*In vivo*): Skin pharmacokinetics (PK), Skin pharmacodynamics (PD), Local toxicity (TK), Formulation (substance is soluble in water).
4. CMC: GMP standards and test methods for APIs

POTENTIAL APPLICATIONS

A new substance is needed to prevent misuse of Tretinoin, which is used in combination with cosmetics. Tretinoin Potassium Salt was developed as a solution, and when registered as an OTC Monograph, it can be sold as an OTC drug for melasma treatment and whitening functional cosmetics at retail marts, pharmacies, department stores, and duty-free shops around the world. The technology company holds four synthetic and drug use patents for Tretinoin Potassium Salt. Upon registration with OTC Monograph and International Cosmetic Ingredient Dictionary (ICID), there are plans to license the patent to major production and sales countries for normal use and sales rights.

MARKET TRENDS & OPPORTUNITIES

Total Addressable Market (TAM) for the whitening market is \$12 billion. This new ingredient has a dual function of anti-acne and melasma which could expand the ballpark Service Available Market (SAM). The core ingredient is about 10% of the sales price of cosmetics and there are plans for earning 5% of sales from granting license rights.

UNIQUE VALUE PROPOSITION

There are a total of six substances (Mulberry Extract, Arbutin, Ethyl Ascorbyl Ether, Oil-soluble licorice Extract, Ascorbyl Glucoside, Magnesium Ascorbyl Phosphate) registered in the OTC Monograph as raw materials for cosmetics and pharmaceuticals for whitening purposes. However, all are Tyrosinase Inhibitors related to melanin pigment. Tyrosinase inhibitors work by blocking the enzyme tyrosinase. Because melanin can absorb, scatter, and reflect light, it protects the skin and maintains body temperature by controlling the number of ultraviolet rays absorbed by the skin. Long-term blockage of melanin production through tyrosinase inhibition has a skin whitening effect, but on the other hand, light can lower immunity and cause side effects

on the skin.

This technology of ionised Tretinoin Potassium Salt promotes cellular turnover activity that regenerates cells from the dermal layer to the epidermal layer in just 14 days compared to the usual 28 days cycle which increases with age till a 60-day cycle. Validation studies have shown the newly discovered compound to be of high skin absorption, retention improvement, low hydrophobicity, little irritation on direct application and can be administered orally.