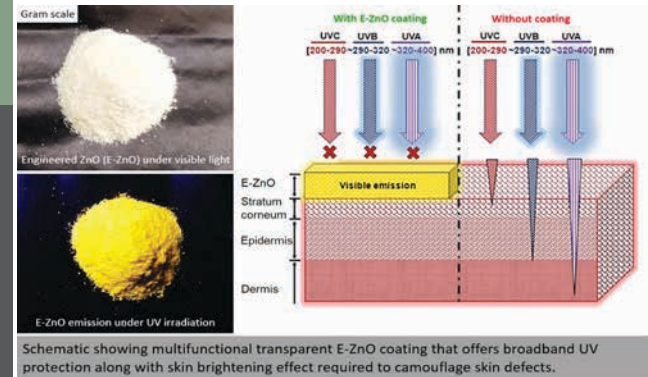


## Shiny Skin™: A Transparent Multifunctional Sunscreen



**Problem Statement:** Rapid ozone layer depletion has expedited the increase in skin cancer in recent times. Skincare products viz. sunscreen lotions help prevent skin cancer and allied skin disorders while also enriching the aesthetic appeal of the skin and rendering the skin wrinkle-free. The researchers came up with a solution that achieves these goals through a novel and multifunctional defect engineered ZnO (E-ZnO) based ultraviolet radiation (UVR) filter that acts as an active ingredient for skincare products.

**Uniqueness of the Solution:** This innovative solution highlights the potential of E-ZnO as a safe and multifunctional UV filter for skincare. E-ZnO is UVR absorbent and exhibits properties of excellent photostability (>4 hrs) enriched by its unique surface chemistry and has high molar absorptivity and broadband UVR attenuation (400 nm to 250 nm). In addition, it has visible emission matching human in vivo skin emission

colour that provide desired skin sensorial properties. In vitro evaluation also shows biocompatibility and antioxidant potential that mitigates skin oxidative stress, thereby minimising the risk of skin cancer. Since it is a patented technology, there are no products of similar property available currently.

### **Current Status of Technology:**

Researchers have achieved ideation, feasibility check, validation, and proof of concept. They have accomplished automation and developed the technology; the next step is to achieve an industrial scale of production and test the product in a relevant environment.

**Societal Impact:** The use of E-ZnO as a multifunctional UVR absorbent is cost-effective, scalable for large-scale production and can achieve maximum health security pertaining to skin melanoma and related skin diseases. Persons working in the construction sector are typically more prone to

occupational skin melanoma, but most labourers cannot afford the expensive treatment. Therefore, the researchers envisage indigenous production of nanotechnology-based sunscreen products that populations below the poverty level can use to help prevent skin cancers.

**Patent(s):** Filed & Granted

**Relevant Industries:** Sunscreen, Pharmaceutical, Cosmetics, Materials.

**Faculty:** Prof. Ajit Kulkarni, Metallurgical Engineering & Materials Science.