Docket #: S21-227

Natural Bacteriophages for Environmentally-friendly Protection from Ultraviolet Irradiation

Stanford inventors have engineered a bacteriophage as a novel class of UV-absorbing particles. These agents may provide an environmentally friendly alternative to current sunscreen products, which are synthetically produced with petroleum products and damaging to marine life. Phages are natural occurring virus that target bacteria with extreme specificity that can be produced with structural precision and scalability, which limit production and quality control challenges. Phages absorb UV irradiation in the liquid phase and when deposited as thin film, such that absorbance measurements demonstrate comparable UV-C, UV-B, and UV-A protection relative to commercially available SPF50 sunscreen.

Stage of Development
The inventors show in a proof of concept that bacteriophages can be engineered to absorb UV rays.

Applications

- Personal skin care and protection products
- UV blocking materials
- Material surface coatings

Advantages

- Current UV-blocking personal care products are environmentally damaging to marine life
- Phages offer an environmentally-friendly active ingredient alternative

Publications

- Jordan, Rob. Safer Sunscreen: Stanford researchers explore novel approach to sustainable sun protection. *Stanford Woods Institute for the Environment News* 2024.

Patents

- Published Application: WO2023044068
- Published Application: 20250134802

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