

TECH OFFER

Protein Cage For Consumer Products And Food Formulations



KEY INFORMATION

TECHNOLOGY CATEGORY:

Foods - Ingredients

Foods - Packaging & Storage

Foods - Processes

Foods - Quality & Safety

TECHNOLOGY READINESS LEVEL (TRL): **TRL4**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174550**

OVERVIEW

Health products are used by most people for improving the quality of life and involves the use of vitamins, minerals and essential biomolecules delivered through dermal and oral routes. These active ingredients are formulated as skin care and nutraceutical products for the management of various physiological processes such as aging, pigmentation, digestion, and metabolism. The formulated active ingredients are seldom effective due to biological barriers of the human body such as the skin and the digestive tract.

To improve their effectiveness, protein nanocages (nCage) can be used to package and deliver active ingredients across the complex barriers, reaching the target site of action. The technology owner have developed the nCage delivery technology to formulate essential active molecules for skin and oral nutraceutical applications. The target users will be product developers and/or formulators of essential active ingredients from the skin care, nutraceutical, and consumer product industries as well as

raw ingredient manufacturers. The technology owner is looking for joint venture partners and licensing opportunities from the skin care and oral nutraceutical companies.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technology comprises naturally-derived, protein-based nCage carriers designed with dual purposes. These nCages are customizable to encapsulate various types of active molecules and can serve as stabilisers in the formulations of lotions, creams and gels.

Advantages of nCage delivery system :

- Improved solubility of active molecules by 10 times
- Targeted delivery to skin cells for the management of pigmentation (first nanocarrier with this property)
- Formation of stable formulations with minimal loss of loaded actives with longer shelf life than conventional carriers such as liposomes that are used for dermal applications
- Sustained release of actives over extended period of time (48 hours) for its action
- Amenability to be formulated into lotions, creams and gels for desired application without the use of additional stabilizers
- Naturally degradable by the human body and the environment leaving no toxic remains

Value propositions :

- The technology will reduce the dosage of the actives by 10 to 20 times
- Customisable for encapsulating specific active ingredients with stable formulations
- Dual purpose of encapsulation and stabilisation reducing the need for extra additives
- Provides targeted delivery to specific cells for intended action
- Nature-derived sustainable system

Technology compliance :

- Considered safe by standard skin tests according to OECD guidelines (Non-irritant and non-allergenic)
- Emulsions formed with nCage are stable over a year at room temperature without additional storage requirements

POTENTIAL APPLICATIONS

The primary area of application for this technology is skin care, health and wellness. Use cases include:

- Formulation of actives for anti-aging, pigmentation control, acne control and moisture control/retention
- Oral nutraceutical delivery: Delivery of probiotics and nutrients for gut health

Other target markets include pharmaceutical industry for the encapsulation and delivery of drugs and diagnostic agents for inflammatory disorders of the skin melanoma and oral treatment for ulcers

UNIQUE VALUE PROPOSITION

The technology will benefit B2B2C consumers looking for a delivery system to encapsulate their active molecules such as players in the skin care, oral nutraceutical, and food stabilizers industries.

Cost saving benefits :

- Reduces the cost of active ingredients needed to be applied for intended healthcare application
- Reduces cost of stabilizers/packaging materials

Environmental benefits :

- Sustainable and environmental-friendly, leaving no toxic residues
- Does not require any synthetic compounds or chemicals for production
- Clean formulations made with only one step using a homogeniser