

Functional Pearl-like Multilayer Nanomaterials

Efficient and Eco-friendly Mass Production via Yeast and Koji Mold Fermentation

Overview

This invention presents a new platform for creating organic- CaCO_3 composite materials with pearl-like multilayer nanostructures using a bio-manufacturing process involving yeast and koji mold.

Building on prior research into the bio-mineralization of *Pteria penguin* pearls, the inventors have successfully expressed the related proteins and enzymes in yeast to produce highly controlled multilayer CaCO_3 crystals.

◆ High-Performance Materials : By optimizing the expression of matrix proteins and enzymes, the crystal structure and material properties can be precisely controlled.

◆ Sustainability : The fermentation-based production process enables large-scale manufacturing with minimal environmental impact and low cost.

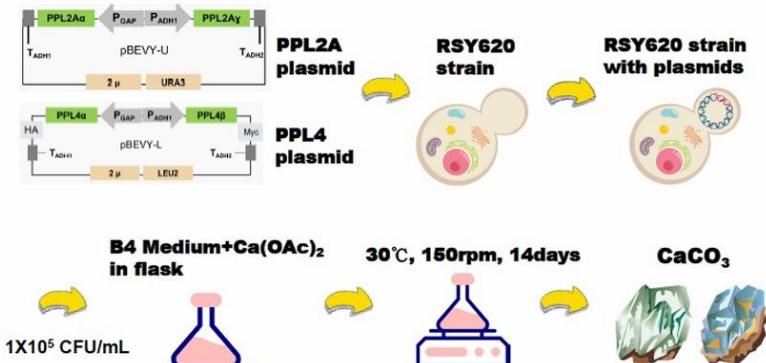
Product Application

- Cosmetics (glossy pigments)
- Optical and Photonic Materials
- Coatings
- Other High-Performance Materials

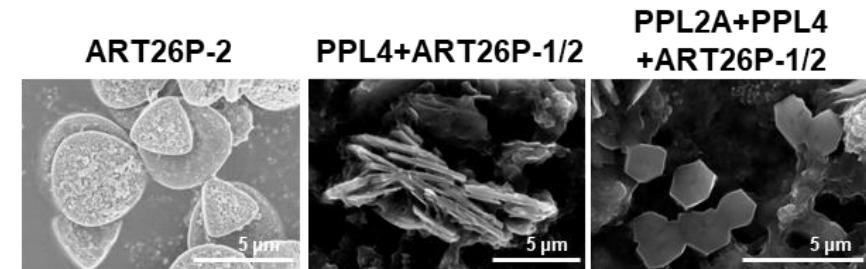
IP Data

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Fermentation Production Scheme



SEM images of CaCO_3 from Yeast Expressing *Pteria penguin* Proteins



ART26P : 26 kDa ADP ribosyl transferase-like proteins
PPL2A/PPL4 : Jacalin-related lectins

Pearl-like multilayer structures and uniquely shaped crystals are formed.

Let's explore how our multilayer nanocrystals can elevate your products!

Tohoku Techno Arch Co., Ltd.
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