

TECH OFFER

## Novel Anti-Microbial Agent For Preventing Dental Caries



### KEY INFORMATION

TECHNOLOGY CATEGORY:

Healthcare - Pharmaceuticals & Therapeutics

Chemicals - Bio-based

Sustainability - Sustainable Living

TECHNOLOGY READINESS LEVEL (TRL): **TRL3**

COUNTRY: **HONG KONG**

ID NUMBER: **TO174145**

### OVERVIEW

The cause of caries (tooth decay) is a formation of biofilm lying on the teeth and subsequently becoming mature. The acid created by specific bacteria (*S. mutans*) dissolves the hard tissues of the teeth (enamel), which can result in pain and difficulty with eating or even tooth loss and infection.

Severe dental caries can impair quality of life but is preventable by maintaining good oral hygiene such as using fluoride toothpaste with brush and dental floss or toothpick to clean between the teeth. However, small children, older adults or people with severe disabilities may find it hard to apply.

Besides, Fluorosis may be resulted if there is overexposure to fluoride. People with Fluorosis will develop white opaques on their tooth surface, which affect the appearance.

In addition, some mouthwash products contain chemicals like alcohol and chlorhexidine to help kill bacteria. The use of these chemicals has some potential drawbacks like altered taste sensation and staining of teeth.

Our new compounds, dihydro-resveratrol or its derivatives can be used for preventing the formation of biofilm and inhibit the growth of bacteria which are cost-effective and very safe to use as they are herbal extracts, which have fewer harmful effects in comparison with those chemical-based products.

## TECHNOLOGY FEATURES & SPECIFICATIONS

Dihydro-resveratrol or its derivatives have a significant inhibitory effect on the growth of bacteria, particularly *S. mutans*. Moreover, the solubility of the said compounds was at least 5 times higher than that of the traditional product, trans-resveratrol. Furthermore, by assessing the mitochondrial metabolic rates of acini, the cytotoxicity of our compounds was approximately 500  $\mu\text{M}$  while the traditional product was roughly 250  $\mu\text{M}$ . That means our compounds were much safer.

These facts demonstrated that our compounds can be good for anti-microbial agents.

## POTENTIAL APPLICATIONS

The said compounds can be used at least twice a day, in the form of toothpaste, oral gel, toothbrush sanitiser, mouthwash or chewing gum for the management of oral hygiene to prevent dental caries. Since our compounds are non-toxic and natural, it would not cause health issue unless a large amount is swallowed.

## MARKET TRENDS & OPPORTUNITIES

Tooth decay or caries is one of the most prevalent conditions and a major public health problem globally. According to the 2017 World Health Organization (WHO)'s Global Burden of Disease Study, caries has become a common problem for different age groups. It is estimated that 2.3 billion people (~30% of the world population) suffer from caries. Among these, 620 million people with primary teeth were affected. Besides, it has been reported that there is a correlation between caries in primary teeth and caries in permanent teeth.

## UNIQUE VALUE PROPOSITION

Since there are abundant quantities of raw materials in nature, dihydro-resveratrol or its derivatives can be largely produced at a minimal cost. Besides, they are easily synthesized with simple steps and will not lead to environmental issue due to disposal. Furthermore, there is no concern of safety, unless a large amount of the compounds are consumed by an individual. Last but not least, our compounds have no smell and they are tasteless so that clients can customize the favour according to their preference.