Covalent Immobilisation of Xanthorrhizol onto Materials Surfaces (A Possible New Antibacterial Coating)

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INTRODUCTION

Problem and Strategy

Nosocomial Infections associated with biomedical devices continue to cause serious problems in human health care. These complications cause significant morbidity and mortality. United State's budget for biomedical device reaches $ 11 billion/ year.

Strategy to hinder the problem is by developing biomedical devices that are resistant to bacterial colonisation and biofilm formation.

Approach - Coatings

Covalent surface immobilization approach to antibacterial compounds onto biomedical devices is preferred rather than diffusive release of antibacterials such as for silver coatings.

Compounds derived from the plants that have been known as traditional medicine are the main focus for investigations on surface coatings.

Advantage

With the increasing incidence of bacterial resistance to established antibiotics, it may be preferable to utilize novel antibacterial compounds for the fabrication of coatings, in order to delay the onset of resistance problems.

Traditional medicine assumed has high compatibility to the host body

TEMULAWAK (*Curcuma xanthorrhiza R.*)

Overview

- Temulawak is a native Indonesian herb.
- It is a *Zingiberaceae family* which grows in most kind of areas. In addition, the plant's rizhome grows well in fertile land and good soil.
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Traditional Usage and Scientific Report

- Traditional usage usually in the form of healthy beverage believed to raise appetite both for adults and children
- Temulawak consists of many bioactive compounds such as xanthorrhizol, l-turmeron, etc
- Reports Testify; bioactive compounds are applicable for anti-inflammation, anti-microbes, cholesterol reducing agent, and anti cancer.
- Xantorrhizol has antibacterial activity (MIC $\leq$2.5 ug/ml).

Xanthorrhizol

- Structurally, xantorrhizol has asymmetrical double bond and aromatic-hydroxyl group.

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