Introduction

Biosurfactants are amphiphilic biological compounds generated by yeast, bacteria, and filamentous fungi in extracellular or cell membrane parts. They are composed of a hydrophilic moiety and a hydrophobic moiety. The biosurfactants' advantages include biodegradability, low toxicity, biocompatibility, and digestibility, availability of raw materials and specificity. The medical application of biosurfactants includes antimicrobial activity by affecting cell membrane permeability, anti-cancer activity, the use of microbial extracellular glycolipids as reagents for cancer cell treatment, antiviral activity, and the use of sophorolipid surfactants as a potent spermicidal and virucidal agent.

Abstract

Biosurfactants are amphiphilic biological compounds generated by yeast, bacteria, and filamentous fungi in extracellular or cell membrane parts. They are composed of a hydrophilic moiety and a hydrophobic moiety. The biosurfactants' advantages include biodegradability, low toxicity, biocompatibility, and digestibility, availability of raw materials and specificity. The medical application of biosurfactants includes antimicrobial activity by affecting cell membrane permeability, antitumor activity, the use of microbial extracellular glycolipids as reagents for cancer cell treatment, antiviral activity, the use of sophorolipid surfactants as a potent spermicidal and virucidal agent, anti-adhesive agents, the use of surfactin solution for inhibiting pathogenic microbe adhesion to solid surfaces or infection sites, and antifungal activity.

Keywords: Biosurfactant, medical applications, microorganism

Medical application of biosurfactant

Antimicrobial activity

Biosurfactants having antimicrobial activity against bacteria and multi-drug resistant strains [5].

Anti-cancer activity

Several microbial glycolipids generate cell differentiation and proliferation in human promyelocytic leukemia cell line. Developing activity of acetylcholine esterase and disconnecting the cell cycle at G1 phase that formed after exposure of PC-3 cells to MEL due to overgrowth of neurites and neuronal cellular differentiation, which is the best work for using of microbial extracellular glycolipids as reagents for cancer cell treatment [8].

Antiviral activity

The inhibiting of HIV virus growth in leukocyte induced by biosurfactants. The inhibiting for presence HIV in women, by controlling, and using safe vaginal topical microbicide. C. bombicola, Sophorolipids have structural analogues similar to sophorolipid diacetate ethyl ester which is a potent spermicidal and virucidal agent.

Anti-adhesive agents

The biosurfactant having ability for inhibition for pathogenic microbe to solid surfaces or infection site. Using of surfactin solution by running with pre-coating vinyl urethral catheter before inoculation with media causing to decreasing in biofilm formation by many bacteria Rodrigues et al. recorded the C. albicans adhesion inhibiting about 85% was recorded after pretreatment of silicone rubber with S. thermopiles surfactant [11].

Anti-Fungal Activity

Antifungal activity for biosurfactant against human pathogens was...
tested. Flocculosin is a glycolipid produced by *P. flocculosa* which having antifungal activity against pathogenic yeasts and human mycoses [10].

**Immunological adjuvants**
Bacterial lipopolysaccharides when mix with classic antigens having active nontoxic, non pyrogenic immunological adjuvants. The increasing of humoral response was explained when Iturin AL antigen and herbicolin A [5]

**Gene delivery**
Many methods for gene transfection, lipofection [15] utilize cationic liposomes to transmit foreign gene to aim cells even side effects. The liposomes rely on biosurfactants having higher efficiency for gene transfection than cationic liposomes trading use [6].

**Results**
1. **Biosurfactants** are amphiphilic biological compounds produced in extracellular or cell membrane part by a different of yeast, bacteria and filamentous fungi.
2. **Many advantages for biosurfactant** include Biodegradability, generally low toxicity, Biocompatibility and digestibility, Availability of raw materials and Specificity.
3. **There are many medical application** for Microbial biosurfactant include antimicrobial activity, anticaner activity, antiviral activity, antiahesive agents, immunological adjuvants, gene delivery.

**Conclusions and recommendations:** Biosurfactants play an important role in industrial applications.

**References**