Copper-polysachharide complex with anti-fungal, anti-bacterial and anti-biofilm activities

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Technology

Prof. Arad and Prof. Kushmaron developed novel anti-fungal agent composed from copper-polysachharide (PS-Cu). The polysachharide is purified from red microalga, followed by addition of copper (in range of declared safety usage) to form the PS-Cu complex. The complexes form a stable needle-like structures. Chemical and physical characterization indicated that the Cu is covalently bound to the polysachharide. It was demonstrated that complex have antifungal (*Candida albicans*) and antimicrobial (*Acinetobacter baumannii*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus aureus* and *Bacillus subtilis*) activities. While comparing standard of care anti-fungal approved drug, it was shown to have better efficacy *in intro* measurement. The complex also demonstrated strong anti-biofilm activity. These nano-structures are hypothesized to prevent bacterial attachment wither physically or via bacterial membrane damage, thus forecasting a broad-spectrum anti-biofilm application in both medical and other industrial settings. One the advantage of this complex is high temperature resistance (121^0C) that enables autoclave sterilization and stability in aqueous solutions in high pH values.

Application

The complex can be used for various infections, including fungal and bacterial. There is high prevalence of co-infection of fungal and bacterial, so dual activity is necessary. This can be used for topical administration, coating medical device as well as for other applications like in the food industry.

Advantages

- Dual-activity
- Additional anti-biofilm activity
- Highly stable – temperature and pH
- Indication that the complex is covalently bound, important to prevent leakage
- Can be sterilized in autoclave
- Complex is easy to produce
- Polysaccharide itself have anti-inflammatory characteristic
- Polysaccharide being commercially available (based on previous Prof. Arad's license technology)

Patents

US 8647635B2; WO2022/162656A1