Long, dense spikes on red algae-derived metal-polysaccharide show promise for anti-microbial applications

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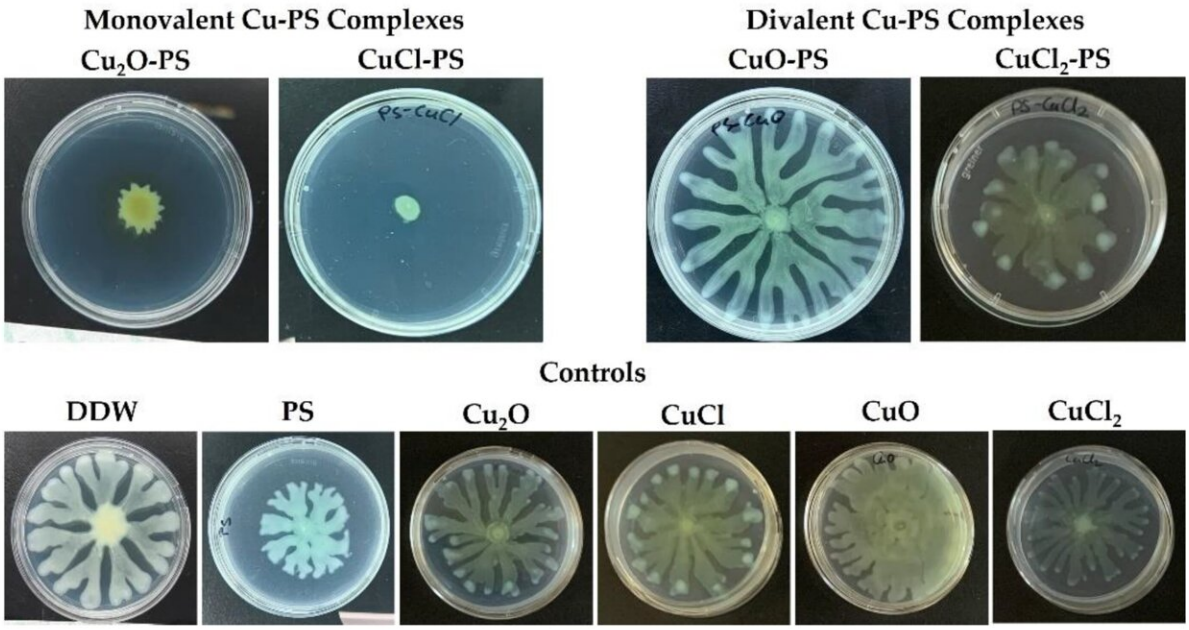

Effect of monovalent and divalent Cu–PS complexes on the swarming motility of P. aeruginosa PA14. Top row: Motility of P. aeruginosa PA14 in the presence of Cu–PS complexes. Bottom row: Controls. The bacteria were inoculated into the center of each plate consisting of M9 solidified with 0.5% (w/v) Difco agar and containing 0.1% of the relevant Cu–PS complex. Surface coverage was assessed after 24 h of growth at 37 °C. All of the Cu–PS complexes contained 0.7% polysaccharide (w/v) and 500 ppm copper. For the control treatments, the copper concentration in the copper-containing plates was 500 ppm, and the PS plate contained 0.7% Porphyridium sp. polysaccharide (w/v). Credit: *Marine Drugs* (2022). DOI: 10.3390/md20120787

Antibiotic resistant bacteria are becoming more and more of a concern as traditional sources of anti-microbial treatments become less effective. Therefore, researchers at Ben-Gurion University of the Negev are looking farther afield for promising compounds to treat wounds and infections.

Prof. Shoshana (Mails) Arad and Prof. Ariel Kushmaro, Prof. Levi A. Gheber and Ph.D. student Nofar Yehuda joined a metal and a polysaccharide together and discovered the new compound worked well against bacteria and fungus (Candida albicans) because of the longer and denser spikes on its surface that poked holes in the membrane and killed off the bacteria and the fungus.

"A polysaccharide is a carbohydrate with linked sugar molecules and by adding a metal (Cu), we were able to create an effective new material," according to the researchers.

Their findings were published recently in *Marine Drugs* as the new compound is derived from marine red microalga Porphyridium sp.

Commercialization of these new compounds could come sooner rather than later.

"In light of the increased resistance to antibiotic and antifungal agents, there is a growing need for the development of new and improved treatments. BGN Technologies holds a patent application ready for licensing in the field," say BGN's Galit Mazooz-Perlmuter and Anat Shperberg Avni. BGN Technologies is Ben-Gurion University's technology transfer company.

More information: Nofar Yehuda et al, Complexes of

Cu–Polysaccharide of a Marine Red Microalga Produce Spikes with Antimicrobial Activity, *Marine Drugs* (2022). DOI: 10.3390/md20120787