

Joint Webinar on
7th World Conference on
Applied Microbiology and Beneficial Microbes
&
3rd International Conference on Applied Microbiology
February 21-22, 2022 | Webinar

Characterization of r-pyocin activity against gram-positive pathogens for the first time with special focus on *S1*

Aim: This study is aimed at characterization of both antimicrobial and anti-biofilm activity of R-pyocin from clinical *Pseudomonas aeruginosa* against Gram-positive pathogens including *Staphylococcus aureus*.

Methods and Results: Pyocinogenic *P. aeruginosa* was detected using reverse-side method, and pyocinogeny typing was confirmed using revised-spotting method. Transmission Electron Microscopy (TEM) was used for morphological characterization of R-pyocin and for detection of changes in membrane of R-pyocin-treated *S. aureus*. SDS-PAGE analysis was used for detection of the molecular weight of R-pyocin protein-subunits and Poisson-killing-distribution assay for burst-size calculation. Lipoteichoic-acid (LTA) adsorption-assay was used to confirm whether LTA in Gram-positive bacteria served as R-pyocin receptor. Moreover, R-pyocin production at 10–60°C was assessed herein. Host-range of activity of R-pyocin was tested against antimicrobial resistant (AMR) pathogens. The anti-biofilm activity of R-pyocin was detected against sensitive bacterial strains. Chemical, enzymatic, pH and thermo-stability of R-pyocin were evaluated. TEM micrographs revealed a typical morphology of myotailocins indicating the production of R-pyocin designated as RPU15.

TEM revealed pores formation in *S. aureus* membrane, and bacteriophage-like plaques were obvious on plates of R-pyocin-treated *S. aureus*. R-pyocin activity was neutralized by LTA of *S. aureus* and *Listeria monocytogenes*. *Pseudomonas aeruginosa* PU15 produced ~428 non-inducible R-pyocin particles. RPU15 sheath and tube protein-subunits exhibited a molecular weight of 38 and 23 kDa, respectively. RPU15 possessed activity against *S. aureus*, *L. monocytogenes*, *Bacillus cereus* and *Candida albicans* and reduced biofilm-biomasses of tested AMR strains.

Biography

Alzhraa Ali Mohamed is a PhD student with her MSc in Microbiology; currently she is working as Faculty of Science department of Microbiology and Botany, Zagazig University, Egypt. She is scientific content Creator on YouTube and Reviewer at Letters in Applied Microbiology Journal.

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