BACTERICIDAL ACTIVITY OF PYOCINS AGAINST CLINICALLY IMPORTANT CARBAPENEMASE-PRODUCING *Pseudomonas aeruginosa*

Turano, H.¹; Gomes, F.²; Netto, L.E.S.²; Lincopan, N¹

¹Departamento de Microbiologia, Instituto de Ciências Biomédicas, Universidade de São Paulo, São Paulo, Brasil; ²Departamento de Genética e Biologia Evolutiva, Instituto de Biociências, Universidade de São Paulo, São Paulo, Brasil

*Pseudomonas aeruginosa* is an opportunistic pathogen causing acute and chronic infections in immunocompromised patients. In this regard, carbapenemase-producing *P. aeruginosa* has been rapidly increasing among hospital-acquired infections. Since therapeutic options are limited, the research of new therapies is essential. A therapeutic alternative is to utilize bacteriocins defined as antimicrobial compounds produced by some bacterial species. Therefore, pyocins (bacteriocins produced by *P. aeruginosa* that are active against other bacteria of the same species) is worthy of investigation. The aim of this study is to evaluate the bactericidal activity of pyocins against clinically important carbapenemase-producing *P. aeruginosa*. In brief, pyocins production was screened in a collection of twenty *P. aeruginosa* strains, including multidrug-resistant (MDR) strains [i.e., carbapenemase (SPM-1, GIM-1, VIM-1, IMP-1, KPC-2 and GES-5)-producing *P. aeruginosa* strains], and antimicrobial activity of pyocins was evaluated by using a conventional pyocin typing method. Additionally, the pyocin production was induced by adding mitomycin C to cultures of pyocin-producing *P. aeruginosa* strains and pyocins were then sedimented by ultracentrifugation. Crude pyocin fractions extracted from three different *P. aeruginosa* isolates displayed the highest killing activity against metallo- and serino-carbapenemase-producing *P. aeruginosa* strains. In summary, pyocins displaying bactericidal activity against carbapenemase-producing *P. aeruginosa* can become an alternative therapy for the treatment of associated infections.

Acknowledgements: CNPq, FAPESP, CAPES

Key words: carbapenemase, *Pseudomonas aeruginosa*, pyocin