

## Evaluation of *Pseudomonas aeruginosa* Strain Specific Antimicrobial Activity of Gallium-Doped Phosphate Based Glasses

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*Pseudomonas aeruginosa* infections are increasingly complex to treat in hospitalized patients due to increasing antibiotic resistance. Hence development of alternative strategies such as the use of gallium doped phosphate-based glasses (Ga-PBGs) is of considerable interest. In this study, the antibacterial effect of Ga-PBGs on 64 well-characterised isolates of *P. aeruginosa* from an international panel. In addition, the synergistic effect of Ga-PBGs and tobramycin on a subset of strains was evaluated. A modified disc diffusion assay was used to examine the antibacterial effect of Ga-PBGs with gallium free PBGs as controls. Subinhibitory tobramycin was used in combination with Ga-PBG to determine the synergistic effect.

Ga-PBGs showed strain specific *P.aeruginosa* growth inhibition, with the largest zone of inhibition > 20 mm (STDEV= 0.816) and smallest < 10 mm (STDEV = 0.767). There was no significant difference in the activity of Ga-PBG against antibiotic susceptible isolates and multidrug resistant isolates (resistant to at least 8 different antibiotics). The inhibitory effects of Ga-PBGs were enhanced in the presence of tobramycin for PAO1 and PA14. Ga-PBGs displayed activity against all 64 *P. aeruginosa* isolates and were effective against highly antibiotic resistant isolates thus highlighting its potential use as a novel therapeutic agent.