Induction of Resistance Against
Antipseudomonal Agents: Comparison
of Novel -Lactam/ -Lactamase
Inhibitor Combinations and Other
-Lactam Agents

INTRODUCTION

- Mutation is the main driver of -lactam (BL) resistance among Pseudomonas aeruginosa isolates.
- New -lactam/ -lactamase inhibitor (BL/BLI) combinations, such as ceftazidime-avibactam, ceftolozane-tazobactam, and imipenem-relebactam, exhibit good activity against most *P. aeruginosa* isolates from US hospitals.
- Limited information is available regarding the potential for these new -lactam/ -lactamase inhibitor combinations to induce resistance in P. aeruginosa compared to older agents.
- We subjected 7 *P. aeruginosa* isolates to a 10-day serial passage with 6 antipseudomonal agents to evaluate resistance levels and mechanisms in terminal mutant strains.

MATERIALS AND METHODS

- Seven P. aeruginosa isolates susceptible to antipseudomonal -lactam agents were subjected to passaging experiments.
- Serial passaging was performed in broth microdilution panels produced according to the CLSI M07 (2018) guidelines.
- The broth from the highest concentration of each antimicrobial agent that displayed visible growth after overnight incubation was used to prepare a new 0.5 McFarland standard (5 x 105 CFU/mL) bacterial inoculum.
- This process was repeated for 9 days.
- Antimicrobial agents used for passaging were ceftazidime-avibactam, imipenem-relebactam, ceftolozane-tazobactam, meropenem, cefepime, and piperacillin-tazobactam.
- All BLIs were added to wells at a 4 mg/L fixed concentration.