

Semi-Quantitative Molecular Detection of 5 Bacterial Pathogens and 47 Antibiotic Resistance Genes in Urine Specimens

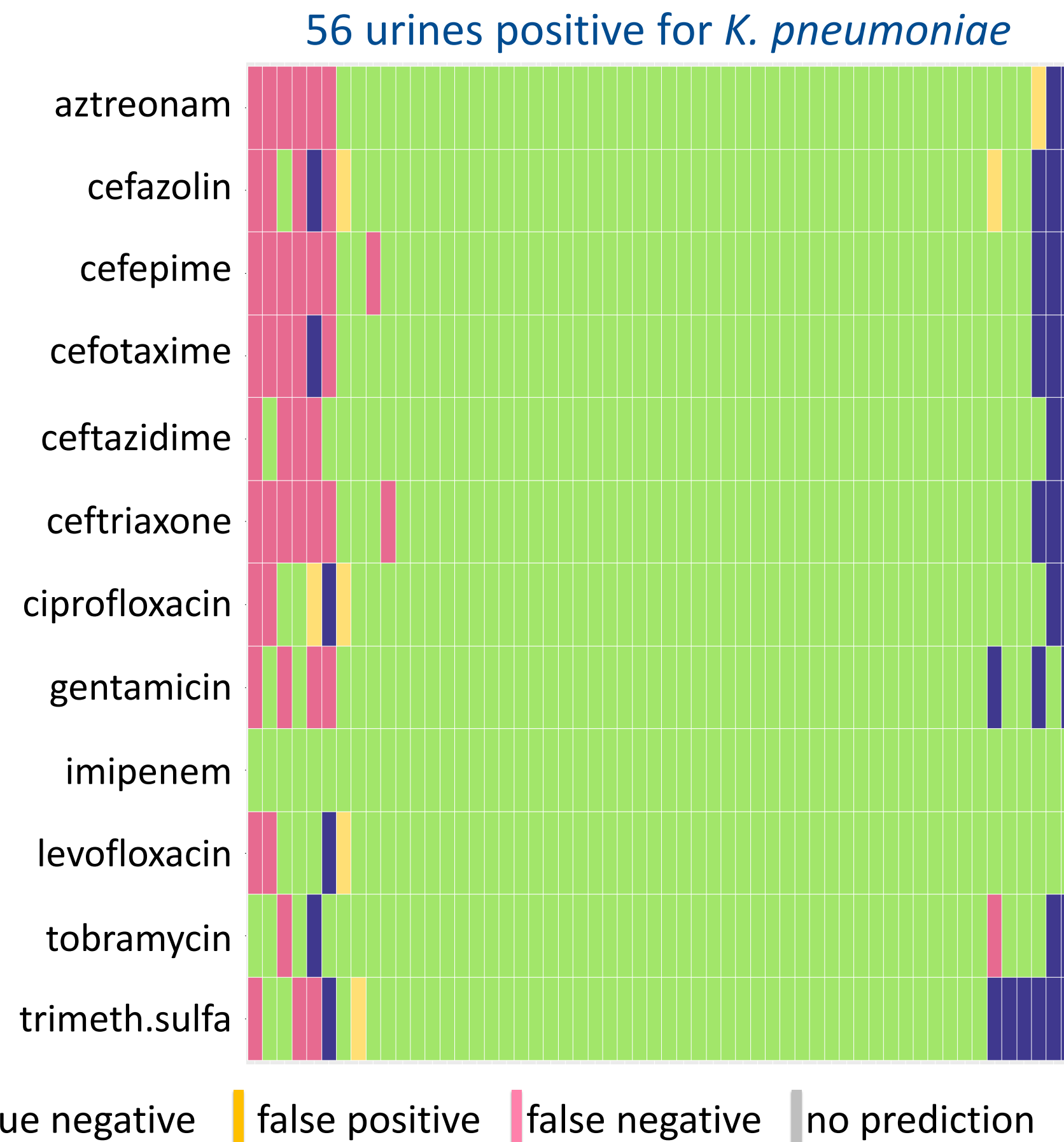
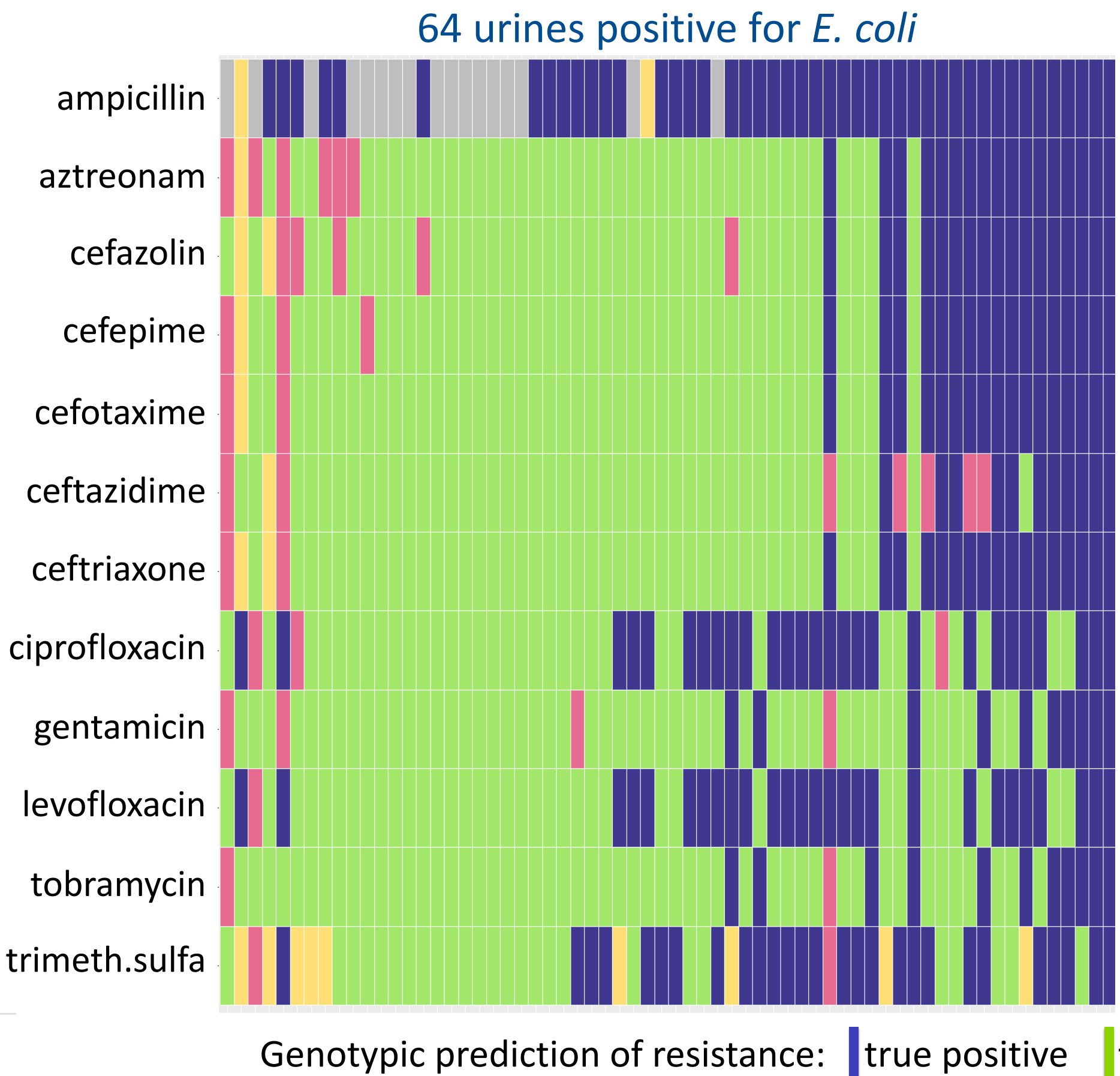
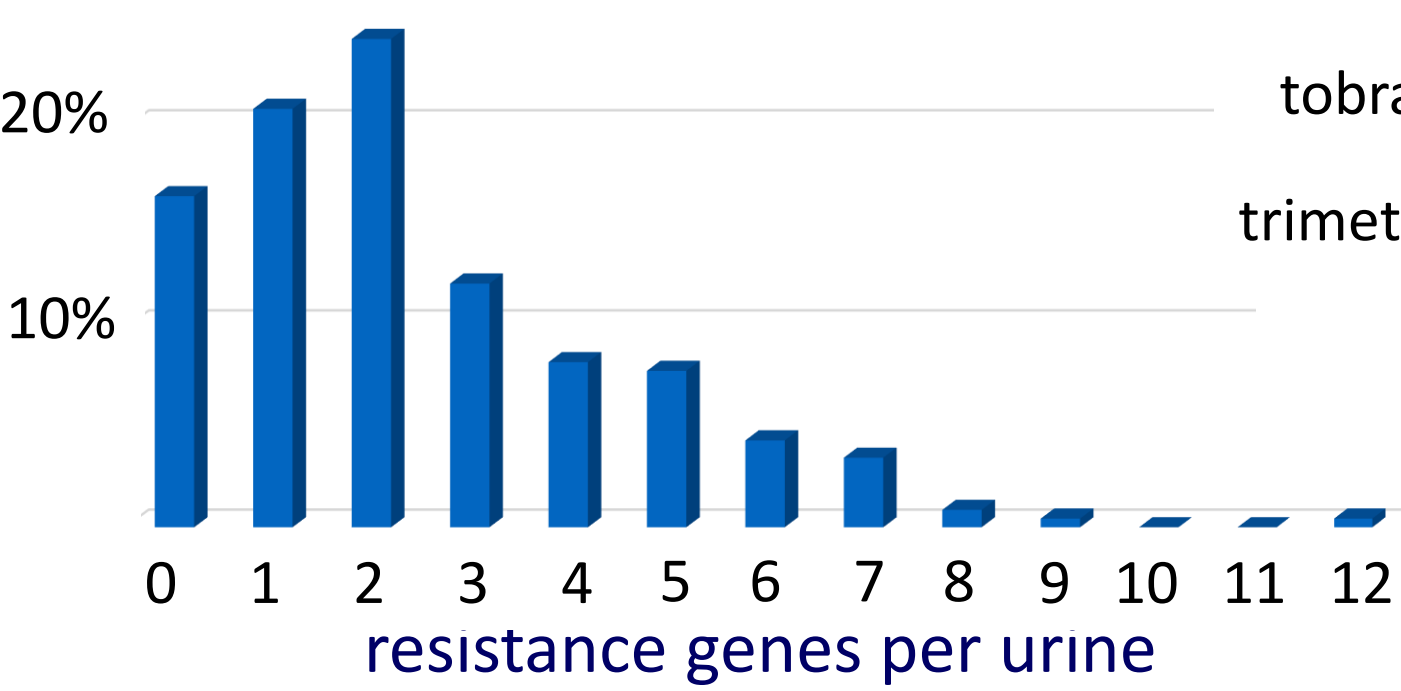
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Background: Molecular tests rapidly detect bacteria but do not comprehensively predict antibiotic resistance compared with conventional antibiotic susceptibility testing.

Methods: We developed the Acuitas[®] AMR Gene Panel u5.47 (RUO)* for semi-quantitative detection of *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Proteus mirabilis* and *Enterococcus faecalis* plus 47 antibiotic resistance genes from urine or bacterial isolates using automated DNA extraction and real-time multiplex PCR with results in 2.5 hours.

We tested 229 remnant urine specimens and predicted phenotypic resistance to 12 antibiotics using statistical algorithms from Acuitas Lighthouse[®] Software (RUO)* for comparison with measured resistance from antibiotic susceptibility testing.



Acuitas Lighthouse accurately predicts antibiotic resistance from resistance genes (% accuracy) → *E. coli* (92%) *K. pneumoniae* (91%)
P. mirabilis (92%) *P. aeruginosa* (100%)

Results: *E. coli*, *E. faecalis*, *K. pneumoniae*, *P. mirabilis* and *P. aeruginosa* were detected at >10⁴ organisms per milliliter of urine with decreasing prevalence. 20% of the urines exhibited mixed infections.

Conclusions: Acuitas AMR Gene Panel u5.47 (RUO)* rapidly detects 5 pathogens and 47 resistance genes in urine specimens and culture isolates. Rapid and accurate detection of antibiotic resistance can improve antibiotic therapy and outcomes in patients with bacterial infections.
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