All isolates 496
All isolates 987
Ceftriaxone
Levofloxacin
activity against Gram-positive organisms including SPN and MDR-SPN and is increasing globally and rapidly in some countries, including the USA. Ceftaroline the United States (USA). Antimicrobial resistance in SPN and MDR-SPN are
pneumoniae
resistant to the commonly used antimicrobials penicillin, ceftriaxone, (21.5% vs. 14.2% in Europe). Ceftaroline was very active against isolates
Ceftaroline MIC50, MIC90, and MIC range (all mg/L) against all isolates
determined by resistance to 3 or more classes of antimicrobials.
Currently under review for approval in the USA.
Ceftaroline fosamil (formerly PPI-0903 and TAK-599) is an N-
for penicillin-binding proteins (PBPs) 1a, 2a, 2b, and 2x, ceftaroline
against all isolates with an MIC range of
Introduction
Ceftaroline (formerly PM-0092 and TAK-599) is an N-
phosphonamidase, which possesses potent spectrum activity. Its bioactive, ceftaroline, is
released in vivo upon hydrolysis of the phospho group.
Ceftaroline has bactericidal activity against Gram-positive pathogens as well as many Gram-negative bacilli. As a result of its high affinity
for penicillin-binding proteins (PBPs) 1a, 2a, 2b, and 2x, ceftaroline demonstrates potent in-vitro activity against multidrug-resistant
Streptococcus pneumoniae (MRS) and multi-resistant Streptococcus pneumoniae (MDR-SPN).
Ceftaroline is currently under review for approval in the USA (Table 1). Encouraging results have been reported from phase III
complicated skin and skin structure infection (cSSSI), as well as community-acquired and hospital-acquired pneumonia (CABP). In the
CABP trials, ceftaroline was efficacious for the treatment of pneumonia including those strains resistant to β-lactams, such as
pneumoniae (SPN) as well as common Gram-negative species, including Pseudomonas aeruginosa, Enterobacteriaceae and
Antimicrobial resistance in SPN continues to increase globally and is a rapid pace in some countries, including the USA. The present study was conducted to evaluate the comparative in vitro activity of ceftaroline and selected comparator agents against recent (2009) SPN and MDR-SPN isolated in Europe and
USA.
Results
Bacterial isolates A total of 987 consecutively significant clinical SPN isolates were

collected in 2009. A total of 485 isolates from 24 medical centers in the USA were tested. Criteria for MDR-SPN included resistance to 3 or more classes of antimicrobials. Nearly 50% of the US isolates were highly resistant to penicillin (MIC ≥ 2 mg/L), the antimicrobial resistance in SPN was low. However, the resistance to other classes of antimicrobials such as β-lactam, carbapenem, fluoroquinolone, macrolide, and TMP/SMX was high (Table 2).

The prevalence of antimicrobial resistance among SPN, including MDR isolates, was high among the collection of respiratory isolates from both the USA and Europe (higher in the USA than in Europe). These elevated rates confirmed the need for new antimicrobials for respiratory infections such as CAPB.
Ceftaroline demonstrated potent high activity against recent pneumococcal isolates, regardless of MDR status, resistance phenotype, or geographic location (Europe or USA).
These data suggest a potentially important clinical role for ceftaroline in the treatment of infections caused by S. pneumoniae, including those sporadically resistant to β-lactams and other commonly used antimicrobials

Materials and Methods
Susceptibility Testing

Broth microdilution methods were performed according to the Clinical and Laboratory Standards Institute (CLSI) M07-A6 (2009) to determine the antimicrobial susceptibility of each organism. Validated MIC panels manufactured by TREK Diagnostics (Cleveland, Ohio, USA) were used. All strains were tested in cation-adjusted Mueller-Hinton (MH) broth supplemented with 2.5% (w/v) yeast hemolymph blood. Susceptibility results were reported as the lowest concentration of antibiotic that inhibited bacterial growth (MBC).

Criteria as published by the CLSI [2010] for ‘Penicillin parenteral (non-meningitis)’ (Susceptible) were used. All strains were tested in cation-adjusted Mueller-Hinton (MH) broth supplemented with 2.5% (w/v) yeast hemolymph blood. Susceptibility results were reported as the lowest concentration of antibiotic that inhibited bacterial growth (MBC).

Conclusions: Antimicrobial resistance in SPN and MDR-SPN continues to increase globally and is a rapid pace in some countries, including the USA. The present study was conducted to evaluate the comparative in vitro activity of ceftaroline and selected comparator agents against recent (2009) SPN and MDR-SPN isolated in Europe and
USA. These data suggest a potentially important clinical role for ceftaroline in the treatment of infections caused by S. pneumoniae, including those sporadically resistant to β-lactams and other commonly used antimicrobials

References