Activity of Tebipenem against *Escherichia coli* collected from Urinary Tract Infections in Europe in 2020

Ian A. Critchley1, Nicole Cotroneo1, Michael J. Pucci1, and Rodrigo Mendes2

1Spero Therapeutics, Cambridge, MA; 2JMI Laboratories, North Liberty, IA

**Background**

- *Escherichia coli* is frequently implicated in urinary tract infections (UTIs) where increasing antibiotic resistance threatens empiric utility of oral agents such as the cephalosporins, fluorquinolones and trimethoprim-sulfamethoxazole (TMP-SMX).
- The increase in antibiotic resistance to oral agents makes the management of UTIs increasingly difficult outside the hospital setting that may result in hospitalization of otherwise healthy patients.1,2

**Methods**

- In total, 764 isolates of *E. coli* were collected from UTI patients in 18 countries in Europe during 2020 as part of the STEWARD Surveillance Program.
- All isolates were shipped to a central laboratory (JMI Laboratories, North Liberty, IA, USA) for identification confirmation, antimicrobial susceptibility testing by broth microdilution in accordance with CLSI guidelines and in combination with high co-resistance to fluoroquinolones and TMP-SMX.1,2

**Results**

- From UTIs, including organisms that exhibit high-levels of co-resistance to fluoroquinolones and TMP-SMX.1,2
- The most prevalent ESBL's include CTX-M variants, which are present in strains of clonal complex ST131 that are resistant to currently available oral agents.2,3

**Conclusions**

- Majority of ESBL, levofloxacin-resistant and TMP-SMX-resistant were 16.5%, 20.9%, and 10%, respectively.
- Among ESBL phenotypes of *E. coli*, high co-resistance: >40% to levofloxacin and TMP-SMX were clearance.
- Among all ESBL isolates, the MICs for tebipenem, tigecycline and meropenem were <0.015 mg/L, ≤0.03 mg/L, and ≤0.015 mg/L, respectively. The MICs for tebipenem ranged from <0.015 to 0.03 mg/L against all resistant subsets including ESBL, levofloxacin-resistant, TMP-SMX-resistant, MDR, and MDR-ESBL-ST131 including isolates with high co-resistance to oral agents such as levofloxacin and TMP-SMX.

**References**