ECCMID 2017
Poster #P1253

In vitro Activity of Omadacycline and Comparators against Gram-Negative Bacterial Isolates Collected from Patients in European Medical Centres (2016): Results from the SENTRY Antimicrobial Surveillance Program

MD Huband, PR Rhomberg, HS Sader, JE Schuchert, RK Flamm
JMI Laboratories, North Liberty, Iowa, USA

Contact Information:
Michael D. Huband, B.S.
JMI Laboratories
345 Beaver Kreek Centre, Suite A
North Liberty, IA 52317
Phone: (319) 665-3370
Fax: (319) 665-3371
Email: michael-huband@jmilabs.com

REVISED ABSTRACT

Background: Omadacycline is a broad-spectrum aminomethylcycline of the tetracycline family in late-stage clinical development for community-acquired bacterial pneumonia and acute bacterial skin and skin structure infections (intravenous and oral formulations). Omadacycline has shown potent *in vitro* activity against key bacterial pathogens, including gram-negative bacterial isolates expressing resistance to β-lactams, fluoroquinolones, and/or common tetracycline-resistance mechanisms. This study evaluated the *in vitro* antibacterial activity of omadacycline and comparators against gram-negative bacterial isolates collected from patients in European medical centres that participated in the 2016 SENTRY surveillance program.

Methods: A total of 4,019 clinically significant *Enterobacteriaceae*, 358 *Haemophilus influenzae*, 162 *Moraxella catarrhalis*, and 297 *Acinetobacter baumannii calcoaceticus* species complex (*A. baumannii*) isolates representing multiple infection types were collected during 2016. One isolate/patient/infection episode was included. Species identification confirmation and antimicrobial susceptibility testing was performed in a central laboratory according to reference (CLSI) broth microdilution methodology and results interpreted per EUCAST/CLSI breakpoints.

Results: Gram-negative isolates were collected from bloodstream infection (BSI; 30.4%), pneumonia in hospitalized patients (PIHP; 22.1%), urinary tract infection (UTI; 16.5%), skin and skin structure infection (SSSI; 14.1%), intra-abdominal infection (IAI; 7.5%), respiratory tract infection (RTI; 9.1%), and other infection types (0.3%). Against *Enterobacteriaceae*, omadacycline ($MIC_{50/90}$ 1/8 mg/L) was very active, inhibiting 87.1% of isolates at ≤4 mg/L; corresponding susceptibilities (EUCAST/CLSI) to levofloxacin, ceftazidime, piperacillin-tazobactam, and tetracycline were 73.4%/73.4%, 74.5%/79.1%, 80.4%/85.0%, and —/60.1%, respectively. Where treatment options may be limited, omadacycline remained active against resistant organisms/groups, including ESBL phenotype *Escherichia coli* ($MIC_{50/90}$ 1/2 mg/L) and *Klebsiella pneumoniae* ($MIC_{50/90}$ 2/8 mg/L; 76.9% inhibited at ≤4 mg/L), ceftazidime-nonsusceptible *Enterobacter cloacae* species complex (*E. cloacae*, $MIC_{50/90}$ 2/8 mg/L; 88.5% inhibited at ≤4 mg/L), and *A. baumannii* ($MIC_{50/90}$ 4/8 mg/L; 64.6% inhibited at ≤4 mg/L). *Haemophilus influenzae* and *M. catarrhalis* isolates were also very susceptible to omadacycline with $MIC_{50/90}$ values of 0.5/1 mg/L and 0.25/0.25 mg/L, respectively.

Conclusions: Omadacycline was very active against contemporary gram-negative isolates from Europe, including resistant strains. Omadacycline inhibited ≥90% of *Enterobacteriaceae*, *A. baumannii*, *H. influenzae*, and *M. catarrhalis* isolates at ≤8, 8, 1, and 0.25 mg/L, respectively. These data support further clinical investigation, especially where resistant pathogens may occur.

Organism	# tested	Omadacycline MIC (mg/L)		Tetracycline MIC (mg/L)		%S EUCAST / CLSI
		MIC_{50}	MIC_{90}	MIC_{50}	MIC_{90}	
Enterobacteriaceae	4,019	1	8	2	>16	— [a] / 60.1
Escherichia coli	1,849	1	2	2	>16	— / 60.6
E. coli (ESBL phenotype)	422	1	2	>16	>16	— / 36.0
Klebsiella pneumoniae	830	2	8	2	>16	— / 63.1
Enterobacter cloacae	323	2	4	2	>16	— / 81.4
A. baumannii	297	4	8	>16	>16	— / 17.8
H. influenzae	358	0.5	1	0.5	1	100.0 / 100.0
M. catarrhalis	162	0.25	0.25	0.25	0.5	100.0 / 100.0

[a] EUCAST breakpoints unavailable

INTRODUCTION

- Omadacycline is a broad-spectrum aminomethylcycline antibacterial of the tetracycline family in late-stage clinical development (intravenous and oral formulations) for community-acquired bacterial pneumonia (CABP) and acute bacterial skin and skin structure infections (ABSSSI)
- Omadacycline has demonstrated potent *in vitro* antibacterial activity against gram-negative bacterial pathogens expressing resistance to β-lactams, fluoroquinolones, and common tetracycline-resistance mechanisms
- This study evaluated the *in vitro* antibacterial activity of omadacycline and comparators against gram-negative bacterial isolates collected from patients with multiple infection types in European medical centres participating in the 2016 SENTRY surveillance program

MATERIALS AND METHODS

- A total of 4,987 gram-negative bacterial isolates composed of 315 *Acinetobacter* spp., 4,019 *Enterobacteriaceae*, 358 *Haemophilus influenzae*, 162 *Moraxella catarrhalis*, and 133 *Stenotrophomonas maltophilia* were collected from patients with multiple infection types in 38 medical centres in 18 European countries and Israel during 2016. Only one isolate per patient/ infection episode is represented
- Bacterial isolates were initially identified by the submitting laboratories and confirmed by JMI Laboratories using matrix-assisted laser desorption/ionization-time of flight mass spectrometry (Bruker Daltonics, Bremen, Germany)
- Susceptibility testing was performed according to CLSI (M07-A10, 2015) reference broth microdilution methodology, and results were interpreted using EUCAST (2017) breakpoint interpretive criteria. CLSI quality control (QC) reference strains (M100-S27, 2017) were tested concurrently and included *Escherichia coli* ATCC 25922, ATCC 35218 and NCTC 13353, *Klebsiella pneumoniae* ATCC 700603, ATCC BAA-1705 and ATCC BAA-2814, *Haemophilus influenzae* ATCC 49247 and ATCC 49766, and *Pseudomonas aeruginosa* ATCC 27853

RESULTS

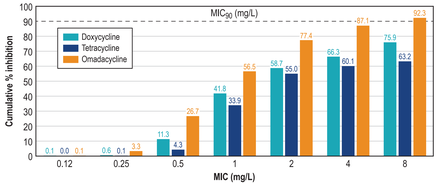
- Overall, 15.7% of the *Enterobacteriaceae* isolates and 15.2% of the *Acinetobacter baumannii calcoaceticus* species complex (*A. baumannii*) isolates obtained in 2016 from European patients were associated with skin and skin structure infections (SSSI; Table 1). The percentages increased to 19.9% and 54.5%, respectively, in patients hospitalized with pneumonia (PIHP; Table 1). Similarly, 12.8% and 63.2% of *Stenotrophomonas maltophilia* isolates were associated with either SSSI or PIHP infections, respectively (Table 1)
- Cumulative percent inhibition data are presented in Table 2 for omadacycline against *Enterobacteriaceae*, nonfermenters (*Acinetobacter* spp. and *S. maltophilia*), and fastidious gram-negatives (*H. influenzae* and *M. catarrhalis*). Figure 1 displays cumulative percent inhibition data for omadacycline and comparator tetracyclines versus *Enterobacteriaceae*. Omadacycline was significantly more active than either doxycycline or tetracycline at each MIC concentration tested (Figure 1)

Table 1 Gram-negative organism counts collected during the 2016 omadacycline surveillance study in Europe stratified by infection type

Organism / organism group	Total	Infection type						
		BSI	RTI	PIHP	SSSI	IAI	UTI	Others
Enterobacteriaceae	4,019	1,406	0	800	631	361	810	11
Escherichia coli	1,849	795	0	185	194	194	478	3
ESBL phenotype	422	170	0	53	54	48	96	1
Klebsiella pneumoniae	830	277	0	226	98	62	165	2
ESBL phenotype	386	126	0	101	48	34	76	1
Klebsiella oxytoca	192	58	0	59	30	15	28	2
Enterobacter cloacae	323	85	0	94	80	32	32	0
Ceftazidime-nonsusceptible	87	24	0	21	21	6	15	0
Enterobacter spp.	102	18	0	40	23	8	12	1
Citrobacter spp.	144	29	0	43	33	18	19	2
Proteus mirabilis	236	56	0	43	75	12	48	0
Indole-positive *Proteus* spp.	130	27	0	24	49	12	18	0
Serratia marcescens	153	38	0	62	41	5	6	1
Other *Serratia* spp.	8	0	0	4	3	0	1	0
Acinetobacter baumannii	297	77	0	162	45	5	8	0
Other *Acinetobacter* spp.	18	3	0	4	9	1	1	0
Stenotrophomonas maltophilia	133	21	0	84	17	5	6	0
Haemophilus influenzae	358	9	303	44	0	0	0	2
β-lactamase-positive	60	2	50	8	0	0	0	0
β-lactamase-negative	298	7	253	36	0	0	0	2
Moraxella catarrhalis	162	1	149	10	0	0	0	2
Totals	**4,987**	**1,517**	**452**	**1,104**	**702**	**372**	**825**	**15**

Abbreviations: BSI, bloodstream infection; RTI, respiratory tract infection caused by *H. influenzae* or *M. catarrhalis*; PIHP, pneumonia in hospitalized patient; IAI, intra-abdominal infection; SSSI, skin and skin structure infection; UTI, urinary tract infection

Figure 1 Cumulative % inhibition results for omadacycline and comparators against 4,019 *Enterobacteriaceae* isolates collected in European medical centres during 2016



- Omadacycline demonstrated good *in vitro* activity against *Enterobacteriaceae* isolates ($MIC_{50/90}$ 1/8 mg/L; 87.1% inhibited at ≤4 mg/L) and was most active against *E. coli*, *E. coli* exhibiting an ESBL phenotype, and *Klebsiella oxytoca* isolates ($MIC_{50/90}$ values, 1/2 mg/L; Table 2). Omadacycline inhibited 93.8% of *Enterobacter cloacae* species complex (*E. cloacae*), 88.5% of ceftazidime-nonsusceptible *E. cloacae*, 95.8% of *Citrobacter* spp., 86.6% of *K. pneumoniae*, 76.9% of ESBL-phenotype *K. pneumoniae*, and 83.0% of *Serratia marcescens* isolates at ≤4 mg/L (Table 2)
- *Enterobacteriaceae* susceptibilities (EUCAST/CLSI) to comparators composed of levofloxacin, ceftazidime, piperacillin-tazobactam, and tetracycline were 73.4%/73.4%, 74.5%/79.1%, 80.4%/85.0%, and —/60.1%, respectively (Table 3)

Table 2 Antimicrobial activity of omadacycline tested against the main organisms and organism groups of isolates included in this study

Organisms / organism group	No. of isolates at MIC (mg/L); cumulative % [a]												MIC$_{50}$	MIC$_{90}$
	≤0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	>		
Enterobacteriaceae (4,019)			0 0.0	3 0.1	128 3.3	943 26.7	1,198 56.6	937 77.4	393 87.1	**287** **92.3**	162 96.3	108 99.0	40 100.0	1	8
Escherichia coli (1,849)			0 0.0	2 0.1	121 6.7	798 49.8	561 80.2	**202** **91.0**	88 96.5	22 99.7	3 99.9	2 100.0		1	2
ESBL phenotype (422)				0 0.0	13 3.1	109 28.9	161 67.1	**102** **91.2**	27 97.6	9 99.8	0 99.8	1 100.0		1	2
Klebsiella pneumoniae (830)			0 0.0	2 0.2	46 5.8	272 38.6	269 71.0	130 86.6	**66** **94.6**	27 97.8	16 99.8	2 100.0	2	8
ESBL phenotype (386)			0 0.0	2 0.5	25 7.0	68 24.6	101 50.8	101 76.9	**54** **90.9**	20 96.1	13 99.5	2 100.0	2	8
Klebsiella oxytoca (192)			0 0.0	1 0.5	24 13.0	127 79.2	**21** **90.1**	12 96.4	6 99.5	1 100.0			1	2
Enterobacter cloacae (323)				0 0.0	7 2.2	108 35.6	146 81.4	**40** **93.8**	8 96.3	8 98.8	4 100.0		2	4
Ceftazidime-nonsusceptible (87)				0 0.0	1 1.1	20 24.1	37 66.7	19 88.5	**6** **95.4**	3 98.8	1 100.0		2	8
Other *Enterobacter* spp. (102)				0 0.0	11 10.8	46 57.8	31 88.2	**5** **93.1**	2 95.1	5 100.0			1	4
Citrobacter spp. (144)			0 0.0	1 0.7	44 31.2	**56** 70.1	26 88.2	**11** **95.8**	4 98.6	2 100.0			1	4
Proteus mirabilis (236)					—	0 0.0	5 2.1	5 4.2	27 15.7	84 51.3	82 86.0	**33** **100.0**	16	>32
Indole-positive *Proteus* spp. (130)					0 0.0	1 0.8	15 12.3	30 35.4	47 71.5	**28** **93.1**	4 96.2	5 100.0	8	16
Serratia marcescens (153)					0 0.0	2 1.3	56 37.9	69 83.0	**23** **98.0**	3 100.0			4	8
Other *Serratia* spp. (8)					0 0.0	2 25.0	3 62.5	2 87.5	1 100.0				1	—
Acinetobacter baumannii (297)			0 0.0	7 2.4	21 9.4	11 13.1	18 19.2	28 28.6	107 64.6	**81** **91.9**	19 98.3	4 99.7	1 100.0	4	8
Other *Acinetobacter* spp. (18)	0 0.0	1 5.6	— 27.8	4 72.2	0 88.9	2 **100.0**								0.25	1
Stenotrophomonas maltophilia (133)				0 0.0	1 0.8	3 3.0	15 14.3	43 46.6	47 82.0	18 95.5	3 97.7	2 99.2	1 100.0	4	8
Haemophilus influenzae (358)			0 0.0		10 3.1	169 50.3	**144** **90.5**	31 99.2	2 99.7	0 99.7	1 100.0			0.5	1
β-lactamase-positive (60)				0 0.0	1 1.7	27 46.7	**31** **98.3**	1 100.0						1	1
β-lactamase-negative (298)			0 0.0	1 0.3	9 3.4	**142** 51.0	113 88.9	**30** **99.0**	2 99.7	0 99.7	1 100.0			0.5	2
Moraxella catarrhalis (162)			0 0.0	64 39.5	**81** **89.7**	7 100.0								0.25	0.25

[a] MIC$_{50}$ values are underlined; MIC$_{90}$ values are bold

Table 3 *In vitro* activity of omadacycline and comparators against gram-negative isolates collected from patients in European medical centres during 2016

Organism (no. tested)	MIC$_{50}$	MIC$_{90}$	CLSI[a]			EUCAST[a]		
antimicrobial agent	(mg/L)	(mg/L)	%S	%I	%R	%S	%I	%R
Enterobacteriaceae (4,019)[r]								
Omadacycline	**1**	**8**	—	—	—	—	—	—
Doxycycline	2	>8	66.3	9.6	24.1	—	—	—
Tetracycline	2	>16	60.1	3.1	36.8	—	—	—
Tigecycline	0.25	1	97.8	2.1	0.1[c]	92.5	5.3	2.2
Levofloxacin	0.06	>4	73.4	0.9	25.7	73.4	0.9	25.7
Ceftazidime	0.25	>32	79.1	2.1	18.8	74.5	4.6	20.9
Piperacillin-tazobactam	2	64	85.0	5.8	9.3	80.4	4.6	15.0
Escherichia coli (1,849)								
Omadacycline	**1**	**2**	—	—	—	—	—	—
Doxycycline	2	>8	66.3	12.3	21.4	—	—	—
Tetracycline	2	>16	60.6	0.3	39.2	—	—	—
Tigecycline	0.12	0.25	99.9	0.1	0.0[c]	99.9	0.1	0.1
ESBL phenotype (422)								
Omadacycline	**1**	**2**	—	—	—	—	—	—
Doxycycline	8	>8	46.2	23.7	30.1	—	—	—
Tetracycline	>16	>16	36.0	0.2	63.7	—	—	—
Tigecycline	0.12	0.25	99.8	0.2	0.0[c]	99.8	0.0	0.2
Klebsiella pneumoniae (830)								
Omadacycline	**2**	**8**	—	—	—	—	—	—
Doxycycline	2	>8	65.0	8.6	26.4	—	—	—
Tetracycline	2	>16	63.1	4.7	32.2	—	—	—
Tigecycline	0.5	1	98.4	1.6	0.0[c]	93.4	5.1	1.6
ESBL phenotype (386)								
Omadacycline	**2**	**8**	—	—	—	—	—	—
Doxycycline	8	>8	44.0	14.8	41.2	—	—	—
Tetracycline	16	>16	40.2	7.8	52.1	—	—	—
Tigecycline	0.5	2	97.7	2.3	0.0[c]	89.4	8.3	2.3
K. oxytoca (192)								
Omadacycline	**1**	**2**	—	—	—	—	—	—
Doxycycline	1	4	92.1	3.7	4.2	—	—	—
Tetracycline	1	8	89.6	2.1	8.3	—	—	—
Tigecycline	0.25	0.5	100.0	0.0	0.0[c]	98.4	1.6	0.0
Enterobacter cloacae (323)[r]								
Omadacycline	**2**	**4**	—	—	—	—	—	—
Doxycycline	2	8	83.9	7.7	8.4	—	—	—
Tetracycline	2	>16	81.4	1.9	16.7	—	—	—
Tigecycline	0.5	0.5	99.4	0.6	0.0[c]	94.4	5.0	0.6
Ceftazidime-nonsusceptible (87)[r]								
Omadacycline	**2**	**8**	—	—	—	—	—	—
Doxycycline	4	>8	57.5	23.0	19.5	—	—	—
Tetracycline	8	>16	46.0	4.6	49.4	—	—	—
Tigecycline	0.5	2	100.0	0.0	0.0[c]	89.7	10.3	0.0
Other Enterobacter spp. (102)[r]								
Omadacycline	**1**	**4**	—	—	—	—	—	—
Doxycycline	1	4	90.2	2.0	7.8	—	—	—
Tetracycline	1	4	90.2	1.0	8.8	—	—	—
Tigecycline	0.25	0.5	100.0	0.0	0.0[c]	94.1	5.9	0.0
Citrobacter spp. (144)[r]								
Omadacycline	**1**	**4**	—	—	—	—	—	—
Doxycycline	1	4	92.4	2.8	4.9	—	—	—
Tetracycline	1	2	93.1	2.8	4.2	—	—	—
Tigecycline	0.25	0.5	100.0	0.0	0.0[c]	97.9	2.1	0.0
Serratia marcescens (153)								
Omadacycline	**4**	**8**	—	—	—	—	—	—
Doxycycline	4	8	66.0	25.5	8.5	—	—	—
Tetracycline	>16	>16	7.8	26.8	65.4	—	—	—
Tigecycline	1	1	100.0	0.0	0.0[c]	90.8	9.2	0.0
Acinetobacter baumannii (297)[r]								
Omadacycline	**4**	**8**	—	—	—	—	—	—
Doxycycline	>8	>8	42.8	2.0	55.2	—	—	—
Tetracycline	>16	>16	17.8	5.7	76.4	—	—	—
Tigecycline	2	4	—	—	—	—	—	—
Acinetobacter spp. (18)[r]								
Omadacycline	**0.25**	**1**	—	—	—	—	—	—
Doxycycline	0.12	0.5	100.0	0.0	0.0	—	—	—
Tetracycline	1	4	100.0	0.0	0.0	—	—	—
Tigecycline	0.12	0.5	—	—	—	—	—	—
Stenotrophomonas maltophilia (133)								
Omadacycline	**4**	**8**	—	—	—	—	—	—
Doxycycline	2	4	—	—	—	—	—	—
Tetracycline	>16	>16	—	—	—	—	—	—
Tigecycline	1	2	—	—	—	—	—	—
Haemophilus influenzae (358)[r]								
Omadacycline	**0.5**	**1**	—	—	—	—	—	—
Tetracycline	0.5	1	99.7	0.0	0.3	99.2	0.6	0.3
Tigecycline	0.12	0.25	95.5	—	[s]	—	—	—
Moraxella catarrhalis (162)								
Omadacycline	**0.25**	**0.25**	—	—	—	—	—	—
Tetracycline	0.25	0.5	100.0	0.0	0.0	100.0	0.0	0.0
Tigecycline	0.06	0.06	—	—	—	—	—	—

[a] Criteria as published by CLSI (2017) and EUCAST (2017).
[b] Organisms include: *Citrobacter amalonaticus* (1), *C. braakii* (2), *C. farmeri* (1), *C. freundii* (25), *C. freundii* species complex (37), *Citrobacter* species complex (11), *Enterobacter aerogenes* (101), *E. asburiae* (9), *E. cloacae* (184), *E. cloacae* species complex (129), *E. kobei* (1), *Escherichia coli* (1,849), gram-negative rods in the family Enterobacteriaceae (1), *Hafnia alvei* (21), *Klebsiella oxytoca* (192), *K. pneumoniae* (830), *Leclercia adecarboxylata* (2), *Morganella morganii* (76), *Pantoea agglomerans* (1), *Plesiomonas shigelloides* (1), *Providencia alcalifaciens* (1), *P. rettgeri* (6), *P. stuartii* (15), *Raoultella ornithinolytica* (9), *R. planticola* (3), *Serratia liquefaciens* (4), *S. marcescens* (153), *S. odorifera* (1), *S. rubidaea* (1), unspecified *Pantoea* (1), unspecified *Raoultella* (6), unspecified *Serratia* (2), *Yersinia enterocolitica* (1)
[c] Breakpoints from FDA Package Insert revised 2016
[d] Organisms include: *Enterobacter asburiae* (5), *E. cloacae* (184), *E. cloacae* species complex (128), *E. kobei* (2)
[e] Organisms include: *Enterobacter asburiae* (2), *E. cloacae* (46), *E. cloacae* species complex (39)
[f] Organisms include: *Enterobacter aerogenes* (101) and *E. aerogenus* (1)
[g] Organisms include: *Citrobacter amalonaticus* (1), *C. amalonaticus / farmeri* (2), *C. braakii* (2), *C. farmeri* (1), *C. freundii* (25), *C. freundii* species complex (37), *C. koseri* (76)
[h] Organisms include: *Morganella morganii* (76), *Proteus vulgaris* group (31), *Providencia rettgeri* (8), *P. stuartii* (15)
[i] Organisms include: *Acinetobacter johnsonii* (2), *A. junii* (1), *A. lwoffii* (4), *A. radioresistens* (3), *A. schindleri* (1), *A. soli* (1), *A. ursingii* (3), *A. vivianii* (1), unspecified *Acinetobacter* (2)
[r] Organisms include: 60 β-lactamase-positive and 298 β-lactamase-negative *H. influenzae*

- The *in vitro* activity of omadacycline and comparator compounds against *Enterobacteriaceae*, nonfermenters, and fastidious gram-negative isolates are presented in Table 3. Omadacycline ($MIC_{50/90}$ 1/8 mg/L) was ≥2-fold more active than doxycycline ($MIC_{50/90}$ 2/>8 mg/L; 66.3% susceptible [CLSI criteria]) and tetracycline ($MIC_{50/90}$ 2/>16 mg/L; 60.1% susceptible [CLSI criteria]) and four- to eight-fold less active than tigecycline ($MIC_{50/90}$ 0.25/1 mg/L; 92.5% susceptible [EUCAST]) against *Enterobacteriaceae*
- Against *A. baumannii* isolates, omadacycline ($MIC_{50/90}$, 4/8 mg/L; 64.6% inhibited at ≤4 mg/L) was slightly less active than tigecycline ($MIC_{50/90}$, 2/4 mg/L), whereas susceptibility to doxycycline ($MIC_{50/90}$, >8/>8 mg/L; 42.8% susceptible [CLSI]) and tetracycline ($MIC_{50/90}$, >16/>16 mg/L; 17.8% susceptible [CLSI]) was low (Tables 2 and 3)
- Omadacycline was active against *S. maltophilia* isolates, inhibiting 82.0% at ≤4 mg/L (Table 2)
- *Haemophilus influenzae* (including β-lactamase-producing strains) were inhibited by omadacycline, tetracycline, and tigecycline (MIC_{90} values 1, 1, and 0.25 mg/L, respectively) (Table 3)
- *Moraxella catarrhalis* isolates were inhibited by low levels of omadacycline ($MIC_{50/90}$, 0.25/0.25 mg/L; 100.0% susceptible at ≤0.5 mg/L), tetracycline ($MIC_{50/90}$, 0.25/0.5 mg/L), and tigecycline ($MIC_{50/90}$, 0.06/0.06 mg/L; Table 3)

CONCLUSIONS

- Omadacycline was active against *Enterobacteriaceae* isolates of multiple infection types, inhibiting 87.1% of all isolates tested at ≤4 mg/L
- The *in vitro* spectrum of omadacycline included ESBL-phenotype isolates of *E. coli* ($MIC_{50/90}$ 1/2 mg/L) and *K. pneumoniae* ($MIC_{50/90}$, 2/8 mg/L; 76.9% inhibited by ≤4 mg/L) and ceftazidime-nonsusceptible isolates of *E. cloacae* ($MIC_{50/90}$, 2/8 mg/L; 88.5% inhibited by ≤4 mg/L)
- Omadacycline was active against nonfermenters, inhibiting 64.6% of *A. baumannii* and 82.0% of *S. maltophilia* isolates at ≤4 mg/L
- *Haemophilus influenzae* (including β-lactamase-positive) and *M. catarrhalis* isolates were inhibited by low levels of omadacycline (MIC_{90}, 1 and 0.25 mg/L, respectively)
- The results of this surveillance study support the continued development of omadacycline in infections where susceptible and drug-resistant gram-negative isolates composed of *Enterobacteriaceae*, *A. baumannii*, *S. maltophilia*, *H. influenzae*, and *M. catarrhalis* are likely to occur, including CABP and ABSSSI

ACKNOWLEDGEMENTS

This study and abstract presentation were funded by a research grant from Paratek Pharmaceuticals, Inc.

REFERENCES

Clinical and Laboratory Standards Institute (2015). *M07-A10. Methods for dilution antimicrobial susceptibility tests for bacteria that grow aerobically; Approved standard – tenth edition.* Wayne, PA: CLSI.

Clinical and Laboratory Standards Institute (2017). *M100-S27. Performance standards for antimicrobial susceptibility testing: 27th informational supplement.* Wayne, PA: CLSI.

EUCAST (2017). Breakpoint tables for interpretation of MICs and zone diameters. Version 7.0, January 2017. Available at http://www.eucast.org/clinical_breakpoints/. Accessed January 2017.

Tygacil Package Insert, Pfizer Inc (Wyeth Pharmaceuticals) (2016). Available at www.tygacil.com. Accessed March 2017.