

# In Vitro Activity of Omadacycline and Comparator Agents Against 485 Infrequently Encountered Bacterial Pathogens from the SENTRY Surveillance Programme

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## In vitro activity of omadacycline against infrequently encountered pathogens

### Objective

Determine the *in vitro* activity of omadacycline and comparators against infrequently encountered Gram-positive, Gram-negative, and anaerobic bacterial pathogens from the SENTRY Surveillance Programme.

### Conclusions

- Omadacycline demonstrated potent *in vitro* activity against infrequently encountered Gram-positive, Gram-negative, and anaerobic bacterial clinical isolates, including strains demonstrating resistance to other drug classes.
- Many bacteria had MIC<sub>90</sub> deemed susceptible to omadacycline when applying established breakpoints for a similar genus or organism group.

### Acknowledgements

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## Materials and Methods

- A total of 485 bacterial isolates were collected from 91 medical centres located in 25 countries in the United States (263 isolates; 54.2%), Europe (190 isolates; 39.2%), Latin America (14 isolates; 2.9%), and the Asia/West Pacific region (3.7%) during 2006–2022.
- Test isolates were collected from patients with bloodstream infection (190 isolates; 39.2% overall), skin and skin structure infection (77 isolates; 15.9%), pneumonia in hospitalized patients (86 isolates; 17.7%), urinary tract infection (33 isolates; 6.8%), intra-abdominal infection (33 isolates; 6.8%), and other infection types (66 isolates; 13.6%).
- Organism identifications were confirmed by MALDI TOF MS and susceptibility testing was conducted according to CLSI M07 (2018), M11 (2018), and M100 (2022) guidelines and results were interpreted using CLSI M100 (2022) and EUCAST (v12.0) breakpoints.

## Results

- Omadacycline demonstrated potent *in vitro* activity against infrequently encountered:
  - Gram-positives, including *Staphylococcus* spp., *Streptococcus* spp., *Enterococcus* spp., *Corynebacterium* spp. (including macrolide and tetracycline-resistant strains), and *Listeria monocytogenes* (Table 1).
  - Most Gram-negatives, including *Burkholderia cepacia* species complex, had omadacycline MIC<sub>50</sub> and MIC<sub>90</sub> values ranging from 0.06–4 mg/L (Table 2).
  - Anaerobes such as *Cutibacterium acnes* and *Porphyromonas gingivalis* (Table 3).

Table 1. Activity of omadacycline and comparators against infrequently encountered Gram-positive organisms

Organism (no. of isolates)	MIC <sub>50/90</sub> mg/L (%S [CLSI / EUCAST]) <sup>a, c, d</sup>							
	Omadacycline		Doxycycline			Erythromycin		
<i>Corynebacterium</i> spp. (10) <sup>b</sup>	0.12	0.5	0.25	8	60/—	8	8	10/—
<i>Enterococcus casseliflavus</i> (10)	0.06	0.06	0.06	0.12	100/—	2	2	20/—
<i>E. gallinarum</i> (10)	0.06	0.12	4	8	70/—	0.5	>8	70/—
<i>E. raffinosus</i> (10)	0.03	0.03	2	4	90/—	>8	>8	20/—
<i>Listeria monocytogenes</i> (10)	0.12	0.12	0.12	0.12	—/—	0.12	0.12	—/100
<i>Staphylococcus capitis</i> (10)	0.12	0.12	0.06	2	100/80	0.12	>8	50/50
<i>S. caprae</i> (10)	0.06	0.12	0.06	0.12	100/90	2	>8	30/30
<i>S. cohnii</i> (10)	0.12	0.25	0.12	0.12	100/90	>8	>8	20/20
<i>S. haemolyticus</i> (10)	0.12	0.5	0.12	0.5	100/90	0.25	>8	50/50
<i>S. hominis</i> (10)	0.06	0.25	0.12	2	100/80	>8	>8	30/30
<i>S. pettenkoferi</i> (10)	0.06	0.12	0.06	0.06	100/100	0.12	>8	50/60
<i>S. pseudintermedius</i> (5)	0.03	—	2	—	100/40	>8	—	40/40
<i>S. saprophyticus</i> (10)	0.12	0.12	0.12	0.12	100/90	>8	>8	20/20
<i>S. simulans</i> (10)	0.06	0.12	0.06	0.12	100/100	0.25	>8	60/60
<i>S. warneri</i> (10)	0.06	0.12	0.06	0.12	100/100	0.12	>8	80/80
<i>Streptococcus canis</i> (10)	0.12	0.25	0.12	8	—/50	0.03	>8	80/80
<i>S. constellatus</i> (10)	0.03	0.06	0.12	4	—/—	0.016	0.03	90/—
<i>S. gallolyticus</i> (10)	0.06	0.12	8	>8	—/—	0.03	>8	70/—
<i>S. gordonii</i> (5)	0.03	—	0.12	—	—/—	0.03	—	60/—
<i>S. intermedius</i> (10)	≤0.008	0.016	≤0.008	0.5	—/—	≤0.008	>8	70/—
<i>S. lutetiensis</i> (5)	0.06	—	4	—	—/—	0.03/—	—	70/—
<i>S. oralis</i> (10)	0.03	0.06	0.12	>8	—/—	1	4	30/—
<i>S. parasanguinis</i> (10)	0.06	0.25	0.12	>8	—/—	2	8	40/—
<i>S. salivarius</i> group (10)	0.03	0.06	0.12	>8	—/—	2	>8	30/—
<i>S. sanguis</i> (10)	0.03	0.03	0.06	4	—/—	1	4	40/—

Green, susceptible according to CLSI or FDA (omadacycline) breakpoint interpretive criteria for specified pathogen or similar genus/organism group.  
Yellow, intermediate according to CLSI or FDA (omadacycline) breakpoint interpretive criteria for specified pathogen or similar genus/organism group.  
Gray, resistant according to CLSI or FDA (omadacycline) breakpoint interpretive criteria for specified pathogen or similar genus/organism group.  
<sup>a</sup> CLSI/EUCAST breakpoint interpretive criteria applied.  
<sup>b</sup> Organisms include: *Corynebacterium amycolatum* (1), *C. jeikeium* (1), *C. simulans* (1), *C. striatum* (6), and *C. urealyticum* (1).  
<sup>c</sup> —, no breakpoint susceptibility data available.  
<sup>d</sup> —, MIC<sub>90</sub> data unavailable due to an insufficient number of isolates tested.

Table 2. Activity of omadacycline and comparators against infrequently encountered Gram-negative organisms

Organism (no. of isolates)	MIC <sub>50/90</sub> mg/L (%S [CLSI / EUCAST]) <sup>a, c</sup>								
	Omadacycline			Minocycline			Levofloxacin		
<i>Acinetobacter</i> spp. (50) <sup>b</sup>	0.12	0.5	0.06	0.25	100 / —	0.12	0.5	98/94	
<i>Achromobacter xylosoxidans</i> (10)	2	8	1	4	90/—	4	8	40/—	
<i>Aeromonas</i> spp. (10) <sup>d</sup>	1	1	0.5	1	—/—	0.016	1	90/80	
<i>Alcaligenes faecalis</i> (10)	4	8	2	4	90/—	1	2	90/—	
<i>Burkholderia cepacia</i> species complex (10)	1	4	2	4	90/—	2	8	60/—	
<i>B. gladioli</i> (10)	4	4	2	2	—/—	0.5	0.5	—/—	
<i>B. multivorans</i> (10)	4	>16	1	8	80/—	4	8	40/—	
<i>Chryseobacterium indologenes</i> (10)	>16	>16	1	2	100/—	0.5	1	100/—	
<i>Delftia acidovorans</i> (10)	0.25	0.5	0.12	0.25	—/—	0.06	0.12	—/—	
<i>Elizabethkingia</i> spp. (10) <sup>e</sup>	4	4	0.5	0.5	—/—	1	2	—/—	
<i>Hafnia alvei</i> (10)	1	2	1	2	100/—	0.016	0.03	100/100	
<i>Ochrobactrum anthropi</i> (5)	1	—	0.5	—	—/—	0.12	—	—/—	
<i>Pantoea agglomerans</i> (10)	0.12	0.25	0.25	0.25	100/—	0.03	0.03	100/100	
<i>Pluralibacter gergoviae</i> (10)	0.5	1	1	1	100/—	0.03	0.06	100/100	
<i>Raoultella</i> spp. (20) <sup>f</sup>	1	2	1	4	90/—	0.03	0.12	95/95	
<i>Serratia liquefaciens</i> (10)	1	1	1	1	100/—	0.03	0.06	100/100	
<i>Shewanella putrefaciens</i> (5)	0.25	—	0.25	—	—/—	0.12	—	—/—	
<i>Sphingomonas paucimobilis</i> (5)	0.06	—	0.016	—	—/—	0.12	—	—/—	
<i>Yersinia enterocolitica</i> (10)	0.5	1	1	2	100/—	0.03	0.06	100/100	

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Yellow, intermediate according to CLSI or FDA (omadacycline) breakpoint interpretive criteria for specified pathogen or similar genus/organism group.  
Gray, resistant according to CLSI or FDA (omadacycline) breakpoint interpretive criteria for specified pathogen or similar genus/organism group.  
<sup>a</sup> CLSI/EUCAST breakpoint interpretive criteria applied.  
<sup>b</sup> Organisms include: *Acinetobacter bereziniae* (10), *A. junii* (10), *A. lwofii* (10), *A. radioresistens* (10), and *A. ursingii* (10).  
<sup>c</sup> —, no breakpoint susceptibility data available.  
<sup>d</sup> Organisms include: *Aeromonas caviae* (4), *A. hydrophila* (5), and unsp. *Aeromonas* (1).  
<sup>e</sup> Organisms include: *Elizabethkingia endophytica* (1), *E. meningoseptica*/*E. anophelis*/*E. mitsudata* (3), and unsp. *Elizabethkingia* (6).  
<sup>f</sup> Organisms include: *Raoultella ornithinolytica* (10), *R. planticola* (6), and unsp. *Raoultella* (4).

Table 3. Activity of omadacycline and clindamycin against anaerobes

Organism (no. of isolates)	MIC <sub>50/90</sub> mg/L <sup>a</sup>			
	Omadacycline		Clindamycin	
<i>Cutibacterium acnes</i> (20)	1	2	0.03	0.25
<i>Porphyromonas gingivalis</i> (5)	0.12	—	≤0.016	—

Green, susceptible according to CLSI breakpoint interpretive criteria.  
<sup>a</sup> —, MIC<sub>90</sub> data unavailable due to an insufficient number of isolates tested.