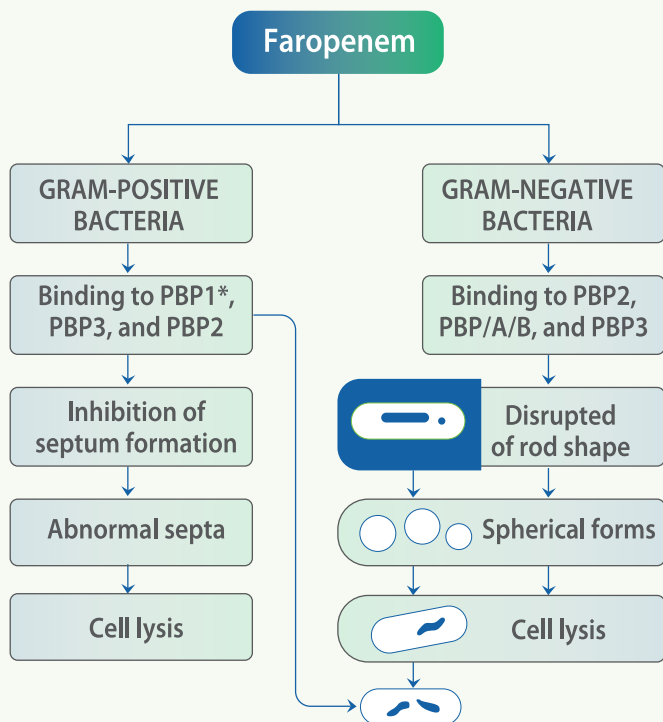


Faropenem: A highly promising oral penem in respiratory tract infections due to its rapid bactericidal action with low MIC against gram positive & gram negative bacterias.

- Faropenem is a next-generation oral β -lactam antibiotic designed to deliver powerful activity against both Gram-positive and Gram-negative bacteria.
- This study highlights Faropenem's unique binding affinity to essential PBPs, resulting in rapid morphological disruption and cell death. Its targeted action ensures potent bactericidal effects while minimizing β -lactamase induction, making it a highly promising choice for community-acquired infection

Study Design		In vitro microbiological & morphological analysis		
Isolates	Type	Centre	Method	Outcome
Gram-positive (<i>S. aureus</i> , <i>S. pneumoniae</i> , <i>E. faecalis</i>) & Gram-negative (<i>E. coli</i> , <i>P. vulgaris</i> , <i>S. marcescens</i>)	Laboratory-based (short-term exposure experiments)	Pharma Research Center, Bayer AG (Germany) & Suntory Institute for Biomedical Research (Japan)	Faropenem exposure at graded MIC levels compared to imipenem/cefuroxime	High PBP affinity, cell wall disruption, abnormal morphology & concentration-dependent lysis of bacterias

Mechanism of action of Faropenem



Conclusion

Faropenem demonstrated 100% activity against all tested isolates, including resistant *S. pneumoniae* & β -lactamase producing *H. influenzae* & *M. catarrhalis*. With rapid bactericidal action and consistently lower MIC values than comparators, faropenem is a highly effective oral option for respiratory infections. It is also well-suited for sequential therapy after hospital discharge, including in conditions such as aspiration pneumonia and osteomyelitis.

*PBP= Penicillin binding protein

Ref.: Chemotherapy 2003;49:172-183DOI: 10.1159/000071141

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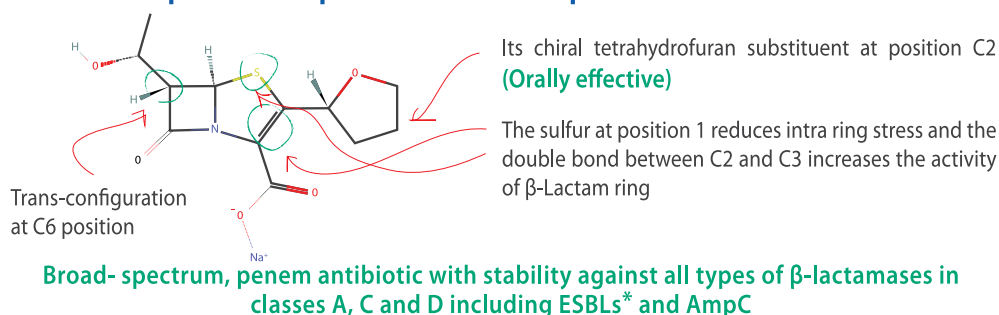
Drug Review

Antimicrobial resistance

- Antimicrobial resistance (AMR) has been prioritized by the World Health Organization (WHO) as one of the top 10 global public health threats facing humanity.²
- Resistance to beta-lactams is an alarming and growing phenomenon and, in turn, a public health challenge. Following are the mechanisms of resistance³ :
 - Inactivation by the production of beta-lactamases.
 - Decreased penetration to the target site (e.g., the resistance of *Pseudomonas aeruginosa*).
 - Alteration of target site Penicillin Binding Proteins (PBPs) (e.g., penicillin resistance in *pneumococci*).
 - Efflux from the periplasmic space through specific pumping mechanisms.

The key distinguishing features of faropenem⁴⁻⁷

Faropenem- a penem with unique chemical structure



Time, concentration and oxygen dependent **bactericidal effect** against **Aerobic, Anaerobic, Gram-positive & Gram-negative** bacteria.

Faropenem has shown lower MICs (Minimum Inhibitory Concentrations) than other beta-lactam antibiotics against certain bacteria.

	Bacteria	Faropenem			Amox - clav		Cefuroxime		Imipenem	
		MIC ₅₀	MIC ₉₀	Range	MIC ₅₀	MIC ₉₀	MIC ₅₀	MIC ₉₀	MIC ₅₀	MIC ₉₀
Gram (+ve)	<i>Staphylococcus aureus</i> (MS)	0.12	0.12	0.03–0.5	1	2	1	2	≤ 0.5	≤ 0.5
	<i>S. aureus</i> (MR)	>32	>32	0.12–>32	8	16	>32	>32	32	32
	<i>Staphylococcus epidermidis</i> (All)	0.12	0.5	0.06 –>128	1	8	0.5	16	0.016	16
	<i>S. epidermidis</i> (MS)	0.12	0.5	0.06 – 4	1	2	0.5	1	0.016	0.016
	<i>Streptococcus pyogenes</i>	0.03	0.03	≤ 0.015 – 0.06	0.03	0.03	≤ 0.015	≤ 0.015	≤ 0.008	≤ 0.008
	<i>Streptococcus pneumoniae</i>	0.008	0.25	≤ 0.004 – 2	0.03	0.5	≤ 0.12	4	≤ 0.5	≤ 0.5
Gram (-ve)	<i>Escherichia coli</i>	0.5	1	0.12 – 32	4	16	4	8	≤ 0.5	≤ 0.5
	<i>Haemophilus influenzae</i>	0.25	1	≤ 0.004 – 4	0.5	1	0.5	2	1	4
	<i>H. influenzae</i> (BLN)	0.25	1	≤ 0.004 – 4	0.5	1	0.5	2	1	2
	<i>Klebsiella pneumoniae</i>	0.5	2	0.25 –>32	2	8	4	>32	0.25	1

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