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ORIGINAL ARTICLE

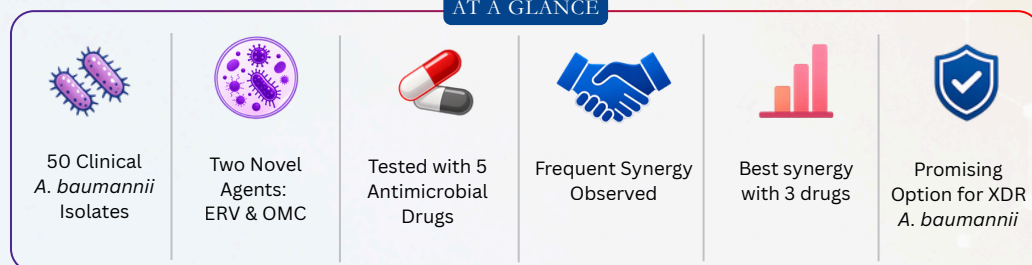
Combined effect of Eravacycline and Omadacycline with other antimicrobial agents against *Acinetobacter Baumannii*

Erkoç Güleriyüz, Ö et al., The Journal of Antibiotics. 2026;79:533-541.

1 Introduction

Multidrug-resistant *Acinetobacter baumannii* (MDR *A. baumannii*) is a critical global threat with limited treatment options. Rising resistance to carbapenems and colistin necessitates exploration of novel agents. Eravacycline (ERV) and Omadacycline (OMC), novel tetracycline derivatives, show promise against resistant strains and in combination therapy.

AT A GLANCE



FIVE EMERGING TRENDS IN PHAGE THERAPY



2 Methodology

Study Design

In vitro study using broth **microdilution** and **checkerboard** assays.

Intervention

Evaluate Eravacycline and Omadacycline in combination with **Meropenem**, **Ceftazidime**, **Ciprofloxacin**, **Tobramycin**, or **Colistin** against MDR *A. baumannii*.

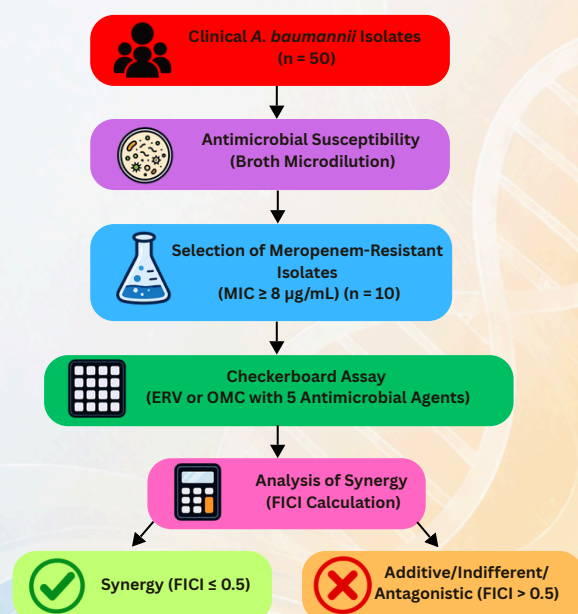
Primary Endpoint

Synergistic activity measured by the fractional inhibitory concentration index (**FICI**) (≤ 0.50 = synergy).

Secondary Endpoint

Minimum inhibitory concentration (MIC), including MIC₅₀/MIC₉₀, and antimicrobial susceptibility of *A. baumannii*.

3 Study Design Flow

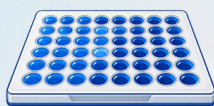


4 Agents Evaluated

- Eravacycline (ERV)
- Omadacycline (OMC)
- Ceftazidime (CAZ)
- Meropenem (MEM)
- Tobramycin (TOB)
- Ciprofloxacin (CIP)
- Colistin (CL)

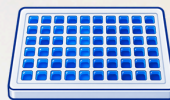
5 Testing Methods

BROTH MICRODILUTION



MIC Determination
CLSI Guidelines

CHECKERBOARD ASSAY



Synergy Testing in 10
Meropenem-Resistant Isolates
(MIC $\geq$ 8 μ g/mL)

KEY DEFINITIONS (FICI)

- Synergy: ≤ 0.5
- Additive: $> 0.5-1$
- Indifferent: $> 1-4$
- Antagonism: > 4

6 Results

A Potent *In vitro* Activity of ERV and OMC

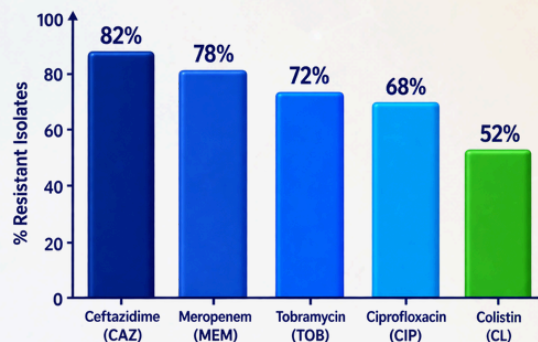
MIC values (μ g/mL) against 50 clinical isolates

Agent	MIC ₅₀	MIC ₉₀	MIC Range
Eravacycline (ERV)	0.25	0.5	0.03-1
Omadacycline (OMC)	0.5	1	0.06-2

✓ Both agents demonstrated very low MIC values against all 50 isolates.

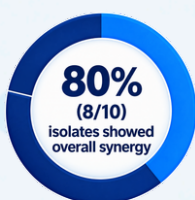
B High Resistance to Conventionally Used Antimicrobial Agents

Percentage of resistant isolates (n = 50)



C Synergy with Antimicrobial Agents

Checkerboard assay in 10 Meropenem-resistant isolates



Combination (with ERV or OMC)	FICI Range (Observed)	Interpretation	No. of Isolates (%)
+ Ceftazidime	0.19-0.50	Synergy	9 (90%)
+ Meropenem	0.25-0.50	Synergy	9 (90%)
+ Colistin	0.25-0.63	Synergy / Additive	8 (80%)
+ Tobramycin	0.31-0.75	Synergy / Additive	7 (70%)
+ Ciprofloxacin	0.38-0.88	Synergy / Additive	6 (60%)

D FICI Interpretation (Checkerboard Assay)

Summary of all combinations tested (n = 10 isolates per combination)

FICI Range	Interpretation	Total Combinations (n = 50)	Percentage
≤ 0.5	Synergy	40	80%
$> 0.5 - 1$	Additive	5	10%
$> 1 - 4$	Indifferent	5	10%
> 4	Antagonism	0	0%

✓ No antagonism (FICI > 4) was not observed

7 Additional Important Data

Overall Synergy Rate

80%
(40/50)

Additive	10% (5/50)
Indifferent	10% (5/50)
Antagonism	0% (0/50)



Synergistic combinations may restore the activity of conventional antimicrobials.

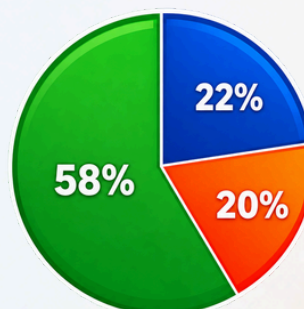


Potential to reduce required doses and minimize toxicity (e.g., colistin).



Supports combination therapy strategies for XDR *A. baumannii* infections.

Carbapenem Resistant Phenotype



- MDR**
(Resistant to ≥ 3 classes)
- XDR**
(Resistant to all but 1-2 classes)
- PDR**
(Resistant to all classes tested)

8 DISCUSSION



ERV and OMC showed superior *in vitro* activity with low MIC values compared to conventional agents.



Synergistic combinations, especially with Ceftazidime, Meropenem and Colistin, suggest improved antibacterial efficacy.



High resistance rates to β -lactams, aminoglycosides, fluoroquinolones and Colistin reflect the therapeutic challenge of XDR strains.



Combination therapy could reduce dose of toxic agents like Colistin and improve clinical outcomes.

9 CONCLUSION

Eravacycline and Omadacycline exhibit potent *in vitro* activity against *Acinetobacter baumannii* and demonstrate valuable synergistic potential with conventional antimicrobial agents.

ARTICLE INFORMATION

- Journal : The Journal of Antibiotics
- Publisher : Springer Nature
- Impact Factor : 2.7
- Quartile : Q3
- DOI : 10.1038/s41429-026-00930-2



Eravacycline-Cefiderocol Combination Therapy for Carbapenem-Resistant *Acinetobacter baumannii* Infective Endocarditis: A Case Report and Brief Review of the Literature

Lou L *et al.*, Infection and Drug Resistance. 2026; 19:615678



1 Executive Summary

This case report rare prosthetic valve endocarditis caused by carbapenem-resistant *Acinetobacter baumannii* (CRAB) in a 66-year-old man. Initial therapies failed and caused renal, coagulation, and electrolyte complications. Eravacycline plus Cefiderocol achieved bloodstream infection clearance and disappearance of valve vegetation. However, progressive paravalvular leakage caused recurrent fever after discharge. Surgery was not feasible due to high operative risk, and the patient died. The combination represents a promising exploratory therapy for refractory CRAB endocarditis, requiring further clinical evaluation.



Day 1
CRAB PVE
diagnosed



Day 6
Cefoperazone/
Sulbactam
stopped



Day 11
Eravacycline
+ Cefiderocol



Day 14
Clinical & imaging
improvement



Day 20
TEE: Aortic valve
vegetation



Day 26
mNGS negative
Bacteremia
cleared



Day 53
Discharged,
afebrile

3 Susceptibility Profile

Antimicrobial Susceptibility	
Antibiotic	Result
Carbapenems (Imipenem, Meropenem)	Resistant
Piperacillin-Tazobactam	Resistant
Cephalosporins	Resistant
Aminoglycosides	Resistant
Fluoroquinolones	Resistant
Tigecycline	Intermediate
Sulbactam	Resistant
Eravacycline	Susceptible
Cefiderocol	Susceptible

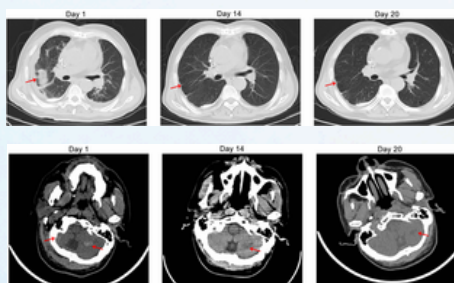
4 Brief Literature Review

Study (Year)	Antibiotics Prescribed	Eradiation	Outcome
Olut AI <i>et al</i> (2005)	Levofloxacin + Netilmicin	No	Death
Durante-Mangoni E <i>et al</i> (2014)	Colistin + Meropenem	Yes	Death
Chen Q <i>et al</i> (2015)	Cefoperazone/Sulbactam sodium	Yes	Survival
Patel G <i>et al</i> (2015)	Piperacillin-Tazobactam + Fluconazole	No	Death

Summary of Previously Reported Carbapenem-Resistant *Acinetobacter baumannii* Infective Endocarditis

6 Clinical Course & Outcome

Parameter	Day 1 (Baseline)	Day 14	Day 29	Day 49	At Discharge (Day 53)
Body Temperature (°C)	38.6	36.8	36.6	36.1	36.4
WBC ($\times 10^9/L$)	15.2	9.8	6.2	5.1	5.0
CRP (mg/L)	138	46	18	6	4
Procalcitonin (ng/mL)	2.87	0.78	0.26	0.09	0.06
Blood Culture	Positive	Positive	Negative	Negative	Negative
TEE (Vegetation)	1.2 cm	0.8 cm	0.4 cm	No vegetation	No vegetation
Clinical Status	Febrile	Improving	Stable	Improved	Stable



ARTICLE INFORMATION

- Journal** : Infection and Drug Resistance
- Publisher** : Taylor & Francis
- Impact Factor** : 3.2
- Quartile** : Q2
- DOI** : 10.2147/IDR.S615678



7 Future Implications



Larger studies needed to validate efficacy and safety of this combination.



PK/PD optimisation for better outcomes.



Development of standardized protocols for CRAB endocarditis.



Multidisciplinary approach essential for complex PVE management.

2 Patient Summary



Age / Gender
66 years /
Male



History
Multiple valve
replacements; pacemaker



Infection
CRAB
prosthetic valve
endocarditis



Previous Therapy
Multiple antibiotics with
persistent infection



Intervention
Eravacycline + Cefiderocol
combination therapy



Outcome
Bloodstream
infection cleared

5 Key Takeaways



CRAB endocarditis is rare and associated with high mortality.



Eravacycline + Cefiderocol combination achieved bacteremia clearance and valve vegetation reduction.



Close monitoring and dose adjustment ensured safety.



Surgical intervention remains essential for complications like paravalvular leakage.



This combination may be a promising option for refractory CRAB endocarditis.



Tebipenem Pivoxil (Utebzi)

A complete Regimen for Complicated UTI, including pyelonephritis



FDA Approval

June 17, 2026



Therapeutic class
carbapenem antibiotic
Prodrug of Tebipenem



Indication

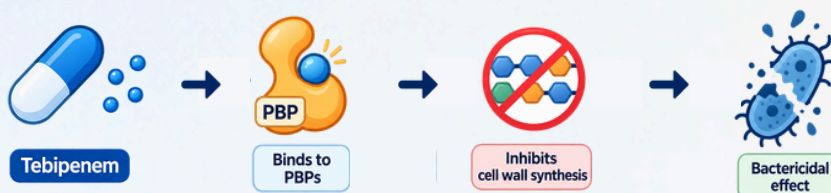
complicated urinary tract infections (cUTIs), including acute pyelonephritis, caused by susceptible bacteria.



Regimen Type

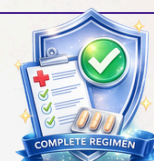
Oral therapy administered as a fixed-dose, twice-daily regimen for the prescribed treatment duration.

1 Mechanism of action



- Tebipenem Pivoxil (prodrug) is hydrolyzed by esterases to the active drug, Tebipenem.
- Tebipenem reaches the bacterial target and binds to essential penicillin-binding proteins (PBPs).
- PBP inhibition blocks peptidoglycan cross-linking and disrupts bacterial cell-wall synthesis.
- Cell-wall damage causes bacterial lysis, resulting in a bactericidal effect and eradication of the infection.

2 Approved Indication



Tebipenem Pivoxil is approved for the oral treatment of complicated **urinary tract infections (cUTIs)**, including **pyelonephritis**, in adults with limited or **no alternative oral treatment options**. It is indicated for cUTIs caused by susceptible strains of *Escherichia coli*, *Klebsiella pneumoniae*, *Enterobacter cloacae* complex, *Klebsiella oxytoca*, and *Enterococcus faecalis*.

3 Dosage & Administration



- Tablet:** Tebipenem Pivoxil 105 mg (equivalent to 100 mg tebipenem).



- Recommended Dose:** One tablet taken orally twice daily (every 12 hours) in adult patients with complicated urinary tract infections, including pyelonephritis.



- Complete Regimen:** The recommended treatment duration is 7–10 days, depending on the clinical response and severity of infection.



- Renal Dose Adjustment:** Dosage adjustment is required in patients with renal impairment; use is not recommended in patients with severe renal impairment or end-stage renal disease.

Pk	Characteristics
Absorption	Peak plasma concentration (C _{max}): 5 mcg/mL AUC: 64.5 mcg·hr/mL
Distribution	Protein bound: ~42%, V _d : 66.4 L
Metabolisms	Tebipenem Pivoxil is primarily metabolized in the gastrointestinal tract
Excretion	Clearance: 34.2 L/hr, Excretion: Urine

4 Safety Profile



Contraindications

- Hypersensitivity** to Tebipenem or other beta-lactam antibacterial drugs
- Patients with primary or secondary **carnitine deficiency** or inborn errors of metabolism that may result in clinically significant carnitine deficiency



Warnings & Precautions

- Seizures** and other **central nervous system (CNS) adverse reactions** reported in patients receiving therapy with Tebipenem
- These adverse reactions occurred most commonly in patients with CNS disorders (eg, **brain lesions or history of seizures**) and/or compromised renal function



Adverse Drug Reactions

- Gastrointestinal Disorders:** Diarrhea, nausea, abdominal pain.
- Nervous System Disorders:** Dizziness, headache.
- General Disorders:** Fatigue, fever.
- Skin Disorders:** Rash, pruritus.

5 Patient Counselling

How to Take



Take orally with or without food, at the prescribed dose and schedule.

Missed Dose



Take when remembered unless it is nearly time for the next dose; do not double the dose.

Do Not Stop



Complete the full prescribed course, even if symptoms improve.

Drug Interactions



Inform doctor about other medicines; avoid interacting drugs as advised.

Watch for Symptoms



Watch for diarrhea, nausea, rash, or signs of allergic reaction.

Monitoring



Monitor clinical response and renal function, especially in patients with renal impairment.

DRUG INFORMATION

Scan to see
Full Drug
Profile



FDA (Drugs@FDA): Idvynso FDA Approval / NDA 216964

भारतीय भेषज संहिता आयोग

स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार
सेक्टर - २३, राज नगर,
गाजियाबाद - २०१ ००२, उत्तर प्रदेश, भारत



INDIAN PHARMACOPOEIA COMMISSION

Ministry of Health & Family Welfare, Government of India
Sector - 23, Raj Nagar
Ghaziabad- 201 002 (U.P.), INDIA

File No. P.17019/03/2026-DSA

Dated: May 27, 2026

Drug Safety Alert

The analysis of Adverse Drug Reaction (ADR) from the PvPI database revealed the following;

S. No.	Suspected Drug	Indication	Adverse Drug Reaction
1	Clonidine	Indicated in the treatment of hypertension.	Hyponatremia

भारतीय भेषजसंहिता आयोग

स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार
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गाजियाबाद - २०१ ००२ (उ.प्र.), भारत



INDIAN PHARMACOPOEIA COMMISSION

Ministry of Health & Family Welfare, Government of India
Sector-23, Raj Nagar
Ghaziabad - 201 002 (U.P.) INDIA

File No. P.17019/03/2026-DSA

Dated: June 30, 2026

Drug Safety Alert

The analysis of Adverse Drug Reaction (ADR) from the PvPI database revealed the following;

S. No.	Suspected Drug	Indications	Adverse Drug Reaction
1	Metoprolol	- Antihypertensive agent- Indicated in the treatment of essential hypertension and angina pectoris. - Adjunct to the treatment of Hyperthyroidism. - Additional indication; i) functional heart disorders, ii) Migraine prophylaxis, iii) Cardiac Arrhythmias, iv) Prevention of cardiac death and reinfarction after the acute phase of myocardial infarction v) Stable symptomatic CHF. - Additional indication: For the treatment of myocardial infarction.	Hyperkalemia

A report on Insights and Overview of Clinical Data Management: Present and Future Prospects

Coordinator: Dr. Deepalakshmi M
Associate Professor

Date: 27.04.2026 - 29.04.2026

The Department of Pharmacy Practice, JSS College of Pharmacy, Ooty, organized a three-day DBT/CTEP-sponsored Popular Lecture Series on Biotechnology from 27th to 29th April 2026 on "Tools for Advancing Personalised Medicine: The Central Role of Pharmacogenomics." The programme aimed to enhance awareness of pharmacogenomics, personalized medicine, oncology applications, and emerging digital health technologies. Eminent experts delivered lectures on current trends in pharmacogenomics, its role in sustainable oncology outcomes, and the application of digital patient twins in treatment planning. The programme included an inaugural and valedictory session with certificate distribution. A total of 250 delegates participated and provided positive feedback, highlighting the programme's academic relevance and impact.



Pharmacogenomics: The Evolving Era of Precision Medicine - A Report

Coordinator: Dr. Ponnusankar S
Professor

Date: 11.06.2026

Dr. D. R. Krishna delivered an informative session on the fundamental principles of pharmacogenomics and its role in optimizing drug therapy based on individual genetic profiles. The lecture highlighted how genetic variations influence drug response, therapeutic outcomes, and adverse drug reactions. Key topics included pharmacogenomic biomarkers, gene-drug interactions, genetic testing, internationally recognized guidelines, and clinical applications in oncology, cardiology, psychiatry, and infectious diseases. Recent advances in next-generation sequencing, artificial intelligence-assisted genomic analysis, and precision medicine were also discussed. Ethical, legal, and economic considerations were addressed. The interactive session generated significant interest and enhanced participants' understanding of genotype-guided therapy and patient-centered care.



Workshop on Competency-Based Education (CBE) - A Report

Date: 20.05.2026 - 21.05.2026

Faculty members from the Department of Pharmacy Practice, JSS College of Pharmacy, Ooty, along with faculty members handling I and II Year Pharm.D courses, participated in the two-day Workshop on Competency-Based Education (CBE) held on 20th and 21st May 2026 at JSS College of Pharmacy, Mysuru. The workshop focused on competency development, formulation of measurable learning objectives, curriculum mapping, constructive alignment, and competency-based assessment strategies. The participation aimed to strengthen the understanding and effective implementation of CBE in the Pharm.D programme at JSS College of Pharmacy, Ooty, which is among the pioneering institutions in India to adopt competency-based education. The workshop provided valuable insights for enhancing learner-centred teaching, assessment, and competency attainment.



Summer School of Ooty on Applied Pharmacokinetics (SOAP-2026) - A Report

Coordinator: Dr. Arun KP
Associate Professor

Date: 15.06.2026 - 20.06.2026

The 8th Edition of the Summer School of Ooty on Applied Pharmacokinetics (SOAP-2026) was successfully organized by COMPASS, Department of Pharmacy Practice, JSS College of Pharmacy, Ooty, from 15-20 June 2026. The six-day intensive programme attracted 139 applications from 12 states, with 41 participants selected through a competitive process. The programme provided advanced training in applied pharmacokinetics, pharmacometrics, therapeutic drug monitoring, Bayesian dosing, pharmacogenetics, PBPK modelling, and model-informed precision dosing. The innovative Spiral Teaching Model integrated progressive case-based learning with practical software training. The programme also featured 15 peer-reviewed poster presentations and received highly positive feedback for its academic rigor, practical orientation, and research-focused learning.



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