



GOLDSTREAM® CARBA SOLUTIONS*

KPC, NDM, IMP, VIM, OXA-48 & OXA-23

**Immunochromatographic Tests
for Detecting the Most Prevalent
Carbapenemase Types**

Obtaining results within 15 mins

*Goldstream® Carbapenem-resistant K.N.I.V.O. Detection K-Set (Lateral Flow Assay)
Goldstream® Carbapenem-resistant OXA-23 Detection K-Set (Lateral Flow Assay)



CRE & CARBAPENEMASES

Carbapenem-resistant Enterobacterales (CRE) has become a public health threat worldwide, as they resist “**last-line**” antibiotics - carbapenems. *Enterobacterales*, a gram-negative bacteria, develops antibiotic resistance by producing **Carbapenemase**, an enzyme that inactivates antibiotics. This bacteria has developed mechanisms to resist one of the most potent classes of antibiotics, which can make it particularly challenging to treat. CRE can induce multidrug-resistant infections in humans, relying on the capability of Carbapenemase.

ANTIBIOTICS ARE LOOSING THEIR POWER GLOBALLY



Antibiotic Resistance

Due to overuse and misuse of antibiotics, bacteria have opportunities to develop resistance. Antibiotics that were once effective against certain bacterial infections may become less or entirely ineffective over time.



> 33,000 Deaths

33,000 people die from infections due to bacteria resistant to antibiotics each year, the number is continuously increasing [1]



Global Issue

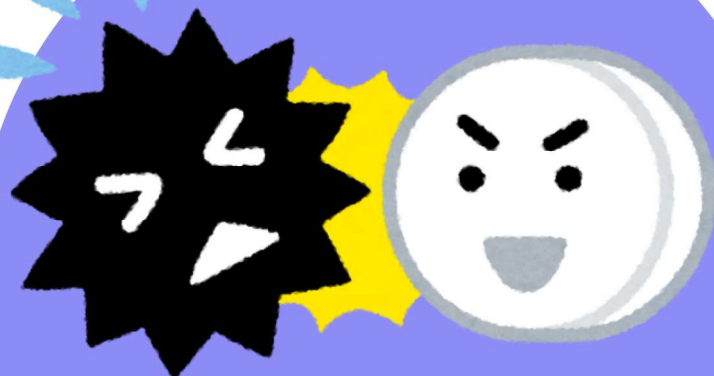
CRE can spread globally through travel and trade. Resistance developed in one part of the world can quickly spread to other regions, making it even more difficult to control.



The Weakened Antibiotics

Resistances like CRE are growing, and the development of new antibiotics is slowing down [2]. One day, we will **run out of antibiotic** options!

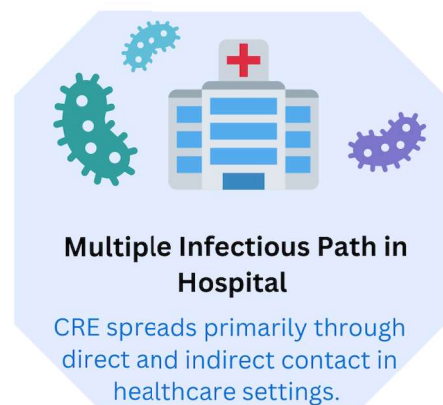
FIGHT CRE NOW!!!!



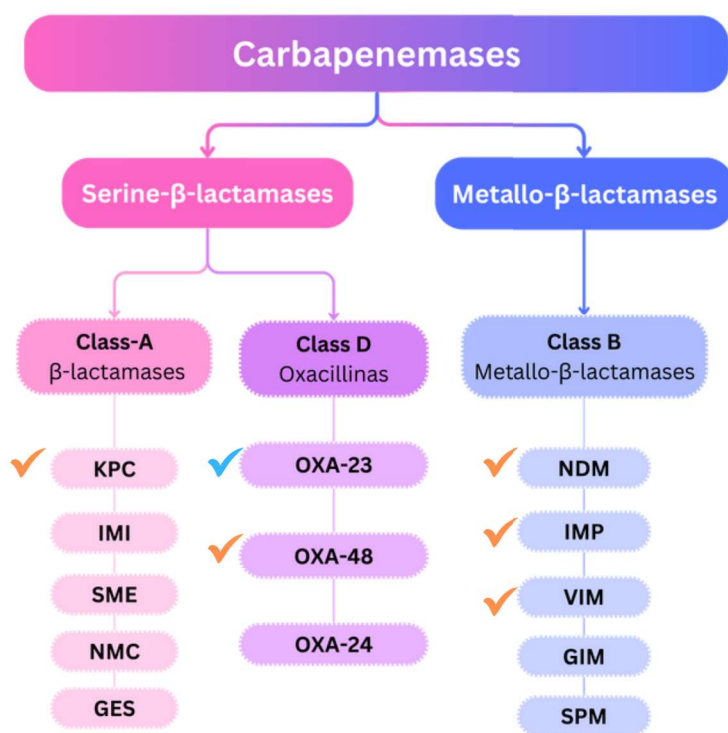
**SECURE THE
LAST-LINE ANTIBIOTICS
FOR HUMAN BEINGS**

All You Need to Know About Carbapenem-resistance

I. CHALLENGES



II. TYPES OF CARBAPENEMASES



✓ CAN BE DETECTED WITH CARBA K.N.I.V.O.
✓ CAN BE DETECTED WITH CARBA CPO-23

IV. THE SNEAKY CRE

Why is CRE so hard to treat with antibiotics? CRE's notorious intrinsic capacity contributes to its stubbornness:

- **Strong Outer Membrane:** CRE, a gram-negative bacteria, presents a challenge for antibiotics to penetrate its outer membrane due to its structurally dynamic cell envelope [5].
- **Break Down Antibiotics:** CRE can hydrolyze and inactivate various antibiotics, including penicillins, cephalosporins, monobactams, and carbapenems [6].
- **Fast Spread:** CRE can easily share their genetic defences to make other bacteria resistant, primarily through plasmid-mediated Carbapenemase, leading to the faster spread of carbapenem resistance worldwide [7].

III. WHY DIFFERENTIATING?

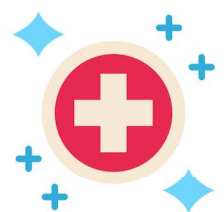
Each carbapenemase reacts differently regarding different antibiotics. This means there is no "all for one" therapeutic approach for the CRE treatment. By identifying the types of CRE, we can select the best antibiotics to:



Reduce the likelihood of **unnecessary prescriptions**

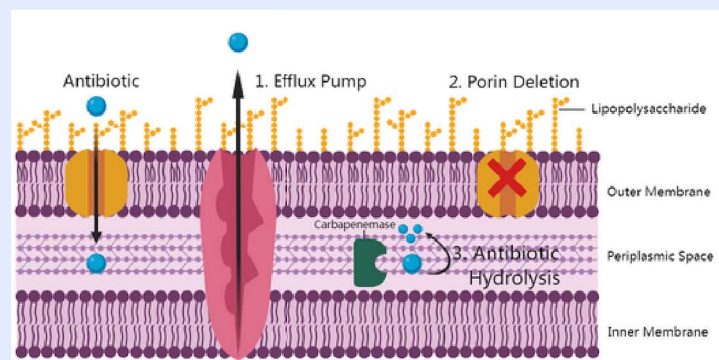


Win **extra time** for clinicians to choose the adequate CRE treatment strategies



Improve **CRE treatment outcomes** and further **prognosis**

V. RESISTANCE MECHANISM



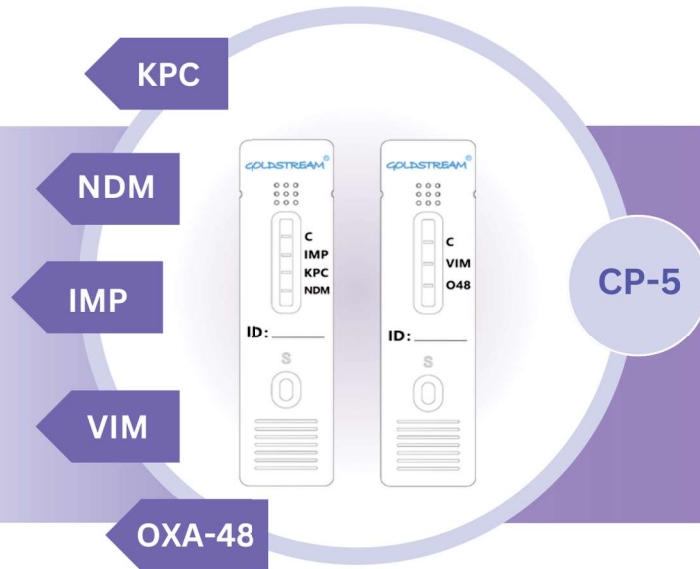
CRE has three major mechanisms in resisting antibiotics

- **Efflux Pumps:** Pump out antibiotics
- **Porin Deletion or Mutation:** Delete or change the specific "entry point" to prevent antibiotics from recognizing it
- **Production of Carbapenemases:** Inactivate and hydrolyze antibiotics by breaking them down [8]

EXPLORE OUR CARBA SOLUTIONS

K.N.I.V.O. Detection K-Set (CP-5 Test)

- The design of 2-cassettes enables better results by avoiding interferences
- Detecting variants**
 - Type KPC: KPC-1, -2, -3, -5, -25, -33, -35, -51, -52, -71, -77, -78, -93
 - Type NDM: NDM-1, -5, -7
 - Type IMP: IMP-1, -3, -4, -6, -8, -10, -25, -26, -30, -34, -38, -40, -42
 - Type VIM: VIM-1, -2, -4, -5, -9, -10
 - OXA-48-like: OXA-48, -163, -181, -232



Main Components

Detection Cassette	25 tests/kit
• Cassette A (KPC/NDM/IMP Detection)	25 cassettes
• Cassette B (VIM/OXA-48)	25 cassettes
Sample treatment solution	10.0 mL
Positive control A	1.0 mL
• Mixed-lyophilized powder of KPC/NDM/IMP carbapenemase	
Positive control B	1.0 mL
• Mixed-lyophilized powder of VIM/OXA-48 carbapenemase	
Package insert	1

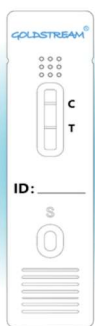
Specification

Specimen	LoD	Shelf Life
Bacterial Colony	KPC..... 0.50 ng/mL	24 months
	NDM..... 0.15 ng/mL	
	IMP..... 0.20 ng/mL	
	VIM..... 0.30 ng/mL	
	OXA-48..... 0.10 ng/mL	
Sensitivity		Storage
100%		2-30°C
Specificity		
100%		

REF: CP5-01

OXA-23 Detection K-Set (CPO-23 Test)

CPO-23



OXA-23

- OXA-23 is a common mechanism contributing to sulbactam resistance in various clinical strains of *Acinetobacter baumannii*.
- Detecting OXA-23 is essential for monitoring antibiotic resistance, guiding infection control measures, and informing precise treatment decisions.
- Detecting variant:** OXA-23

Main Components

Detection Cassette	25 tests/kit
Sample treatment solution	10.0 mL
Positive control	1.0 mL
• Lyophilized OXA-23 carbapenemase	
Package insert	1

Specification

Specimen	Sensitivity	Specificity
Bacterial Colony	98.4%	100%
LoD	Shelf Life	Storage
0.1 ng/mL	24 months	2-30°C

REF: CPO23-01

Serine β -
lactamases:
KPC, OXA-23,
and OXA-48

+

Metallo- β -
lactamases:
VIM, IMP,
and NDM.

=

ERA CARBA
SOLUTIONS

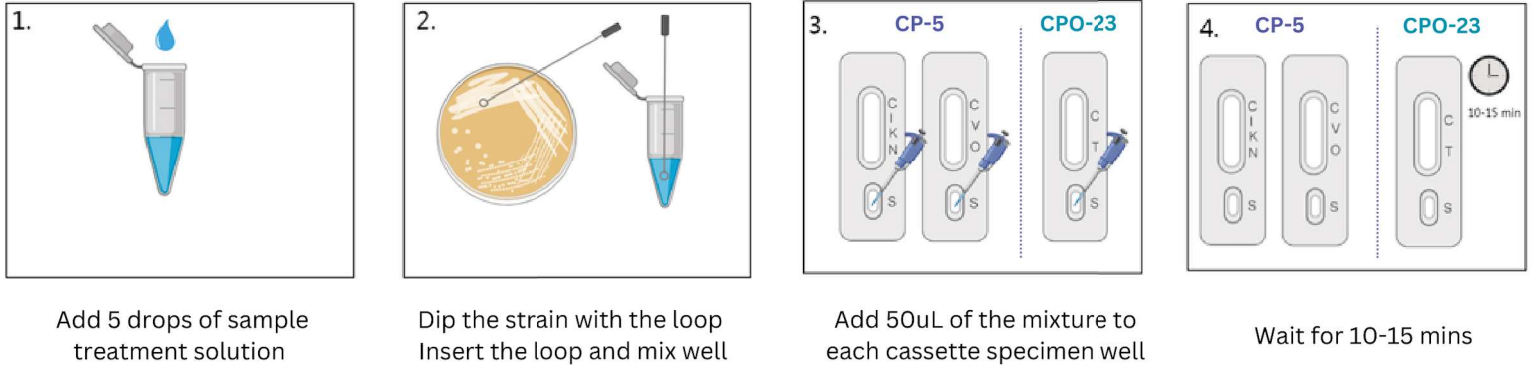


6 most prevalent types of Carbapenemase

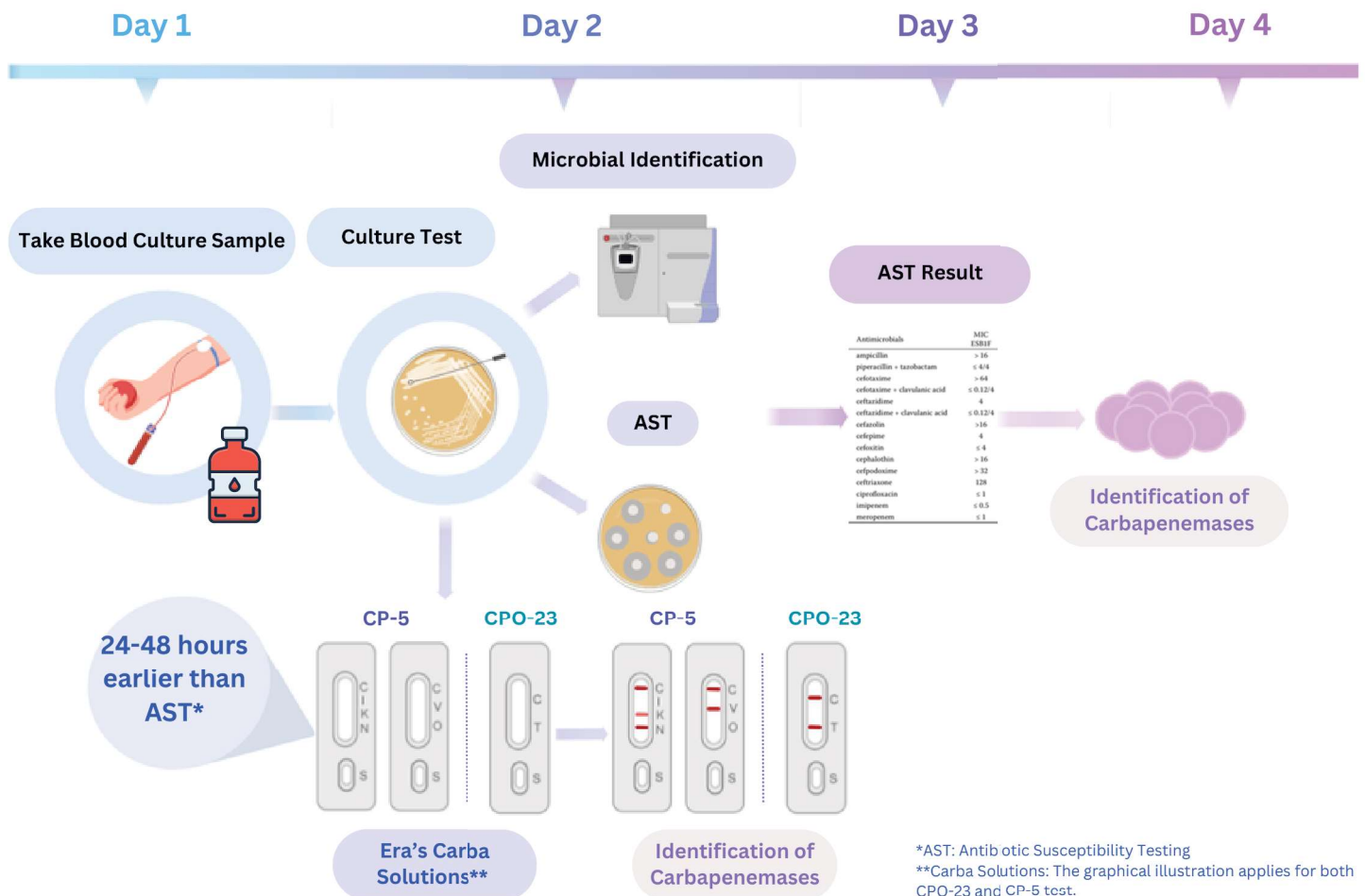
ERA'S CARBA SOLUTIONS YOUR BEST LAB PARTNER



Simple Operating Procedure



Complete Your Traditional Work Flow



*AST: Antibiotic Susceptibility Testing

**Carba Solutions: The graphical illustration applies for both CPO-23 and CP-5 test.



Aiding Earlier Diagnosis

Carba Solutions provides test results 24-48 hours earlier than traditional AST.



Treatment Efficacy

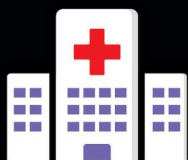
Carba Solutions enables surveillance of antibiotic resistance, allowing clinicians to make treatment adjustments accordingly.



Simplifying CRE Testing

Carba Solutions simplifies regular testing for high-risk groups by eliminating the need for complex microbial identification instruments.

Advantages



Hospital Admission
Screening



Assisting in Medication
Optimization



Rapid



Accurate



User-Friendly

- **Rapid**
 - < 5 mins of hands-on-time
 - Results in < 15 mins
 - Helps early diagnosis by providing results 1-2 days earlier than traditional testing methods, such as culture tests and antibiotic susceptibility tests (AST)
- **Smooth Workflow**
 - Offers convenient operation with minimal training
 - No supporting equipment needed
 - Smoothly incorporates into existing microbiology lab workflow
- **Accurate**
 - High sensitivity & specificity ~100%
- **Comprehensive Coverage of Carbapenemases**
 - Excellent performance in detecting the most prevalent carbapenemase variants
 - Enables the identification of expressed types of carbapenemases (KPC, OXA-48, OXA-23, VIM, IMP, NDM)
- **Cost-effective**
 - No maintenance costs, remaining stable at room temperature with a two-year shelf life.
 - No hidden costs, 1 test =1 reportable result
- **User-Friendly**
 - Easy-to-use and simple operating procedure
 - Requires only 10 mL of sample volume for detection

Order Information

Product Name	REF #	Test Volume
Carbapenem-resistant K.N.I.V.O. Detection K-Set (Lateral Flow Assay)	CP5-01	25 Tests/Kit
Carbapenem-resistant OXA-23 Detection K-Set (Lateral Flow Assay)	CPO23-01	

References

[1] European Centre for Disease Prevention and Control (ECDC). (2018, November 6). 33,000 people die every year due to infections with antibiotic-resistant bacteria. *Science Daily*.

[2] Jaana. (2014, June 13). What is antibiotic resistance and Why does it matter? *Mostly Science*.

[3] Wang, Q., Zhang, Y., Yao, X., Xian, H., Liu, Y., Li, H., Chen, H., Wang, X., Wang, R., Zhao, C., Cao, B., & Wang, H. (2016). Risk factors and clinical outcomes for carbapenem-resistant Enterobacteriaceae nosocomial infections. *European Journal of Clinical Microbiology & Infectious Diseases (Print)*, 35(10), 1679–1689.

[4] Banerjee, R., & Humphries, R. (2017). Clinical and laboratory considerations for the rapid detection of carbapenem-resistant Enterobacteriaceae. *Virulence*, 8(4), 427–439.

[5] Zhou, C., Jin, L., Wang, Q., Wang, X., Chen, F., Gao, Y., Zhao, C., Chen, H., Cao, B., & Wang, H. (2021). Bloodstream Infections Caused by Carbapenem-Resistant Enterobacteriales: Risk Factors for Mortality, Antimicrobial Therapy and Treatment Outcomes from a Prospective Multicenter Study. *Infection and Drug Resistance*, 14, 731–742.

[6] Ferreira, R. J., & Kasson, P. M. (2019). Antibiotic Uptake Across Gram-Negative Outer Membranes: Better Predictions Towards Better Antibiotics. *ACS infectious diseases*, 5(12), 2096–2104.

[7] Tompkins, K., & van Duin, D. (2021). Treatment for carbapenem-resistant Enterobacteriales infections: recent advances and future directions. *European journal of Clinical Microbiology & infectious diseases: official publication of the European Society of Clinical Microbiology*, 40(10), 2053–2068.

[8] Teresa, M. (2019). Present and Future of Carbapenem-resistant Enterobacteriaceae (CRE) Infections. *Antibiotics*, 8(3), 122.

[9]: Aurilio, C., Sansone, P., Barbarisi, M., Pota, V., Giaccari, L. G., Coppolino, F., Barbarisi, A., Passavanti, M. B., & Pace, M. C. (2022). Mechanisms of Action of Carbapenem Resistance. *Antibiotics*, 11(3).



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