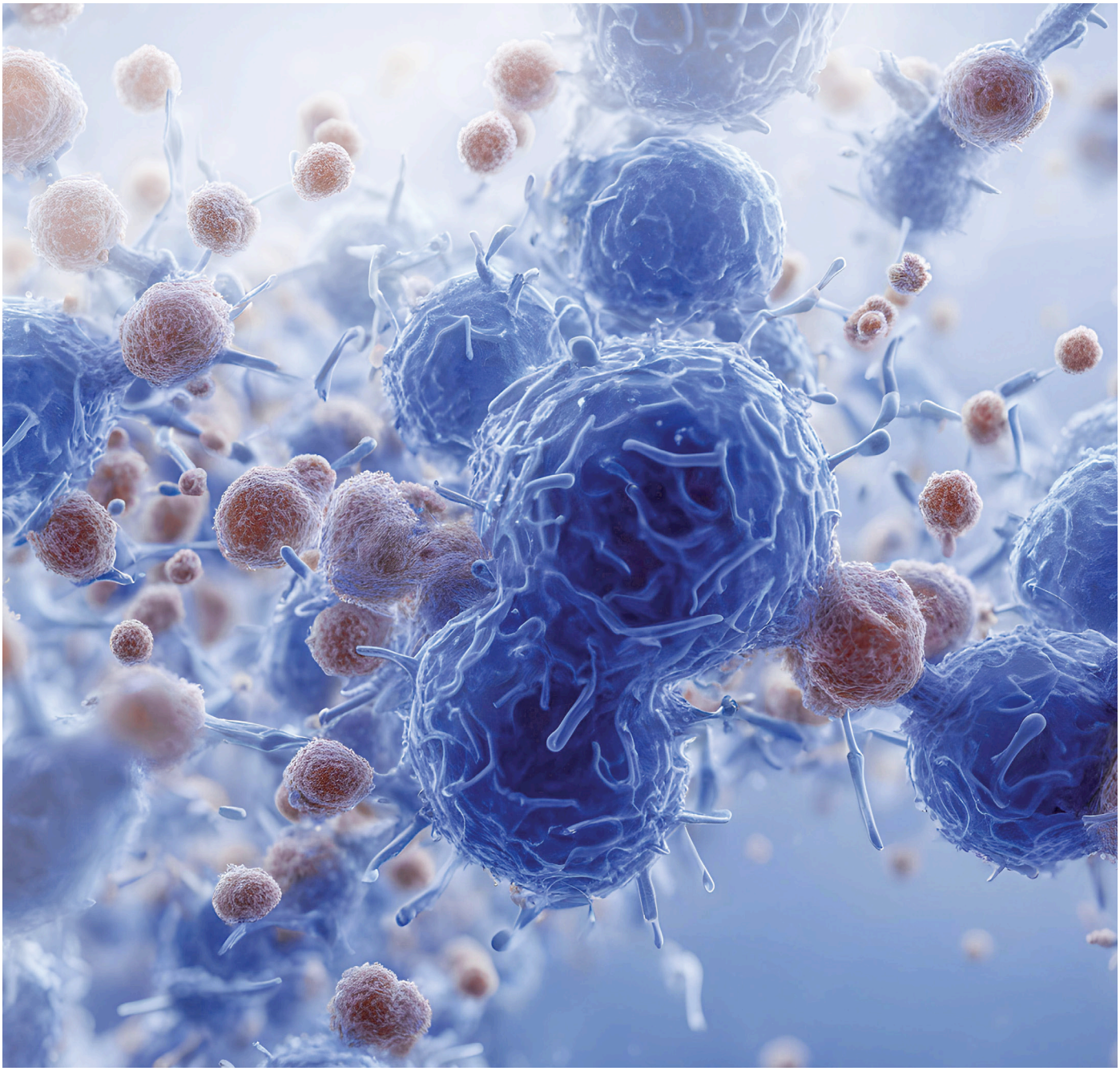
Antimicrobial Resistance Testing

For more than 30 years, Bio-Rad has delivered a comprehensive suite of solutions for antimicrobial resistance testing, supporting microbiology laboratories in combatting this global challenge and enhancing patient care.



Visit bio-rad.com/antimicrobial-resistance-testing for more information.

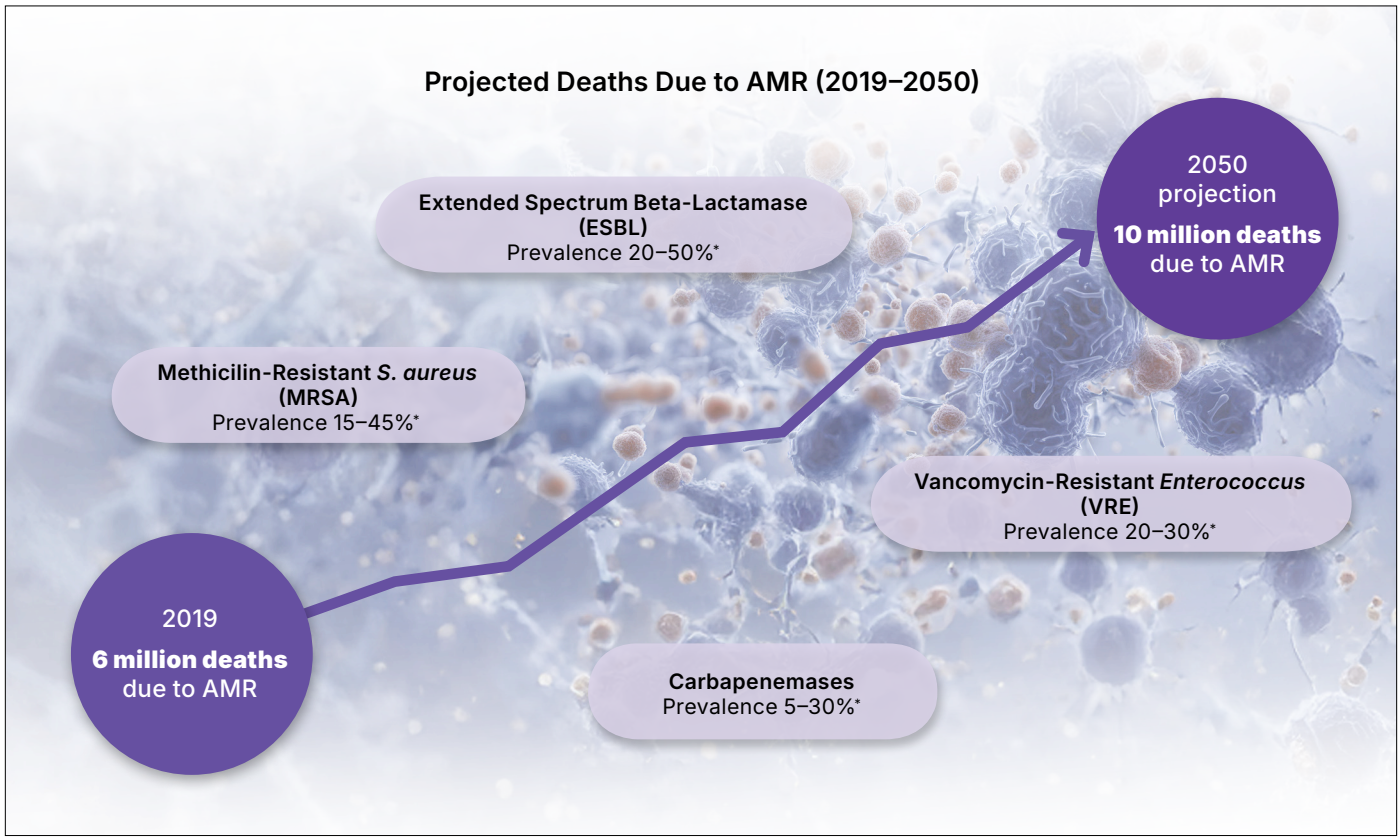
BIO-RAD

Antimicrobial Resistance: A Global Public Health Challenge

The Impact of Resistant Pathogens

Antimicrobial resistance (AMR) is an urgent threat to global public health. According to the World Health Organization (WHO), resistance is rising worldwide and poses a significant risk to human health.[1] Projections indicate that by 2050, AMR could be responsible for approximately ten million deaths: two million directly attributed to AMR and an additional eight million in which AMR is a contributing factor.[2]

As this challenge grows, clinical laboratories play a particularly crucial role in fighting AMR. Through effective testing, laboratories can help mitigate the impact of AMR and prevent its further spread.



Choosing the Right Tools

Quick and reliable testing is challenging for clinical diagnostic laboratories. AMR detection and confirmation in the lab can take several days, causing delays that can lead to inappropriate antibiotic use, which not only harms patients but also contributes to the spread of resistance. It is essential for laboratories to use high-quality screening and detection methods that deliver complete and relevant results, enabling clinicians to select the most effective treatments and avoid the misuse of antibiotics.

Additionally, early and effective detection can reduce healthcare costs by shortening the length of hospitalizations, and it can also contribute to epidemiological surveillance and research, leading to a clearer understanding and more effective strategies to combat AMR globally.

*Statistics vary by country.

© 2025 Bio-Rad Laboratories, Inc.

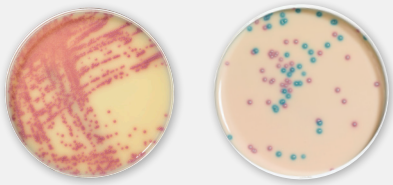
Your Partner in Antimicrobial Resistance Testing

Bio-Rad delivers a broad spectrum of solutions to support your lab in tackling AMR. Whether you need solutions for screening or for detection, Bio-Rad provides the tools you need to make accurate, efficient diagnoses helping to reduce the growing threat of infections due to resistant microorganisms.

1. MDRO* Screening and Surveillance

Chromogenic Media

MRSASelect II and VRESelect for rapid and easy detection



2. AMR Detection and Surveillance

Resistance Mechanism Testing

β LACTA and β CARBA tests for rapid detection of resistance to β-lactam antibiotics





AST† Culture Media

Mueller-Hinton Agar Media for disk diffusion susceptibility testing



AST Disks

~100 antibiotic disk options for semi-quantitative, *in vitro* susceptibility testing



AST Disk Dispensers

Disk dispensers to accurately place Bio-Rad AST Disks onto culture media

Compliant with EUCAST, CLSI, and CA-SFM/EUCAST

Yeast and Mycoplasma Susceptibility Testing

FUNGITEST Kit and S.I.R Mycoplasma Kit for specialty testing and microbial issues



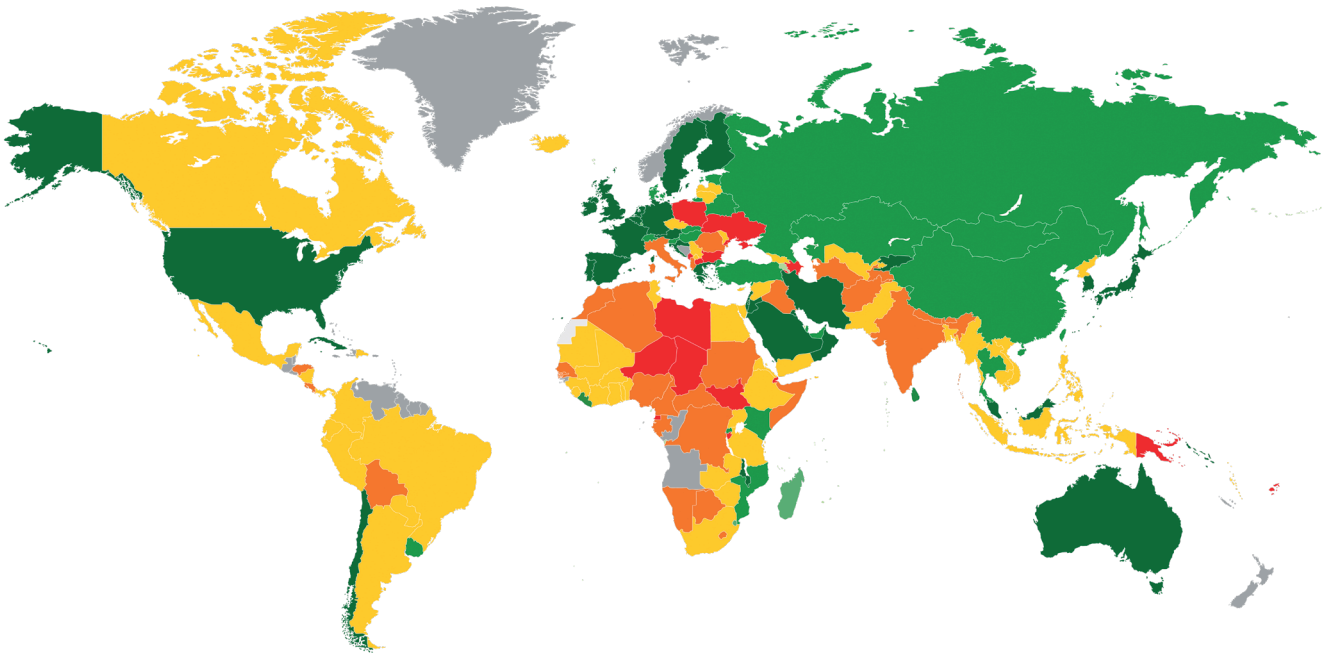
*MDRO, multidrug-resistant organisms.
†AST, antimicrobial susceptibility testing.

© 2025 Bio-Rad Laboratories, Inc.

MDRO Screening and Surveillance

Infection prevention and control (IPC) is a practical, evidence-based approach that prevents patients, staff, and visitors from being harmed by avoidable infections[3] and limits the transmission of multidrug-resistant organisms (MDRO). However, implementation varies widely across regions. This world map highlights the urgent need for stronger, more consistent IPC practices.[4]

Implementation of IPC around the World



(World Health Organization, 2022)

Effective screening strengthens IPC and reduces the spread of MDROs. By identifying carriers of resistant bacteria such as methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant *Enterococcus* (VRE), clinicians can take swift action to isolate patients and prevent outbreaks.

With fast, easy-to-interpret results, chromogenic media are a powerful tool for both targeted screening and ongoing surveillance of MDROs in clinical settings.

Our solutions empower laboratories to deliver quick, actionable results, enhancing patient care and improving infection control.

© 2025 Bio-Rad Laboratories, Inc.

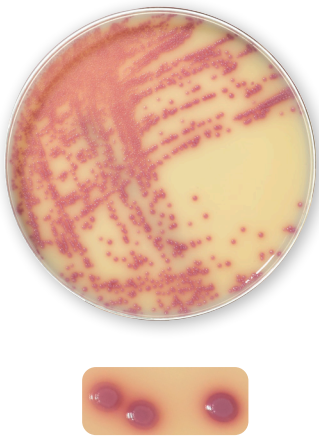
Easy-to-Read MDRO Chromogenic Media

Simplify the screening process for MDROs. Chromogenic media offer visual identification of resistant bacteria, accelerating diagnosis and enabling timely infection control measures to prevent hospital-associated infections (HAIs). This cost-effective and convenient solution also equips healthcare professionals with reliable data to implement proactive strategies to fight MDROs.

The MRSASelect II Agar and VRESelect Agar are selective and differential chromogenic media used for the qualitative detection of methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant *Enterococcus* (VRE), including both *Enterococcus faecium* (VRE-fm) and *Enterococcus faecalis* (VRE-fs).

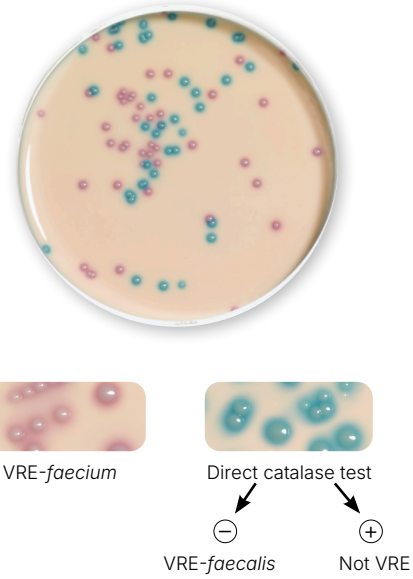
The agars are FDA-510(k) cleared and EU-IVDR certified and are compatible with most automated plate streakers available on the market.

MRSASelect II Agar



Methicillin-resistant
S. aureus

VRESelect Agar



Bright Colors

Bio-Rad chromogenic media use bright, high-contrast colors (pink for MRSA, and pink and blue for VRE-fm and VRE-fs) for easy-to-spot results.

Opaque Background

Transparent backgrounds can be hard to view results on.

With Bio-Rad chromogenic media's opaque backgrounds, it's simple to visually identify resistant bacteria.

Reliable Visibility

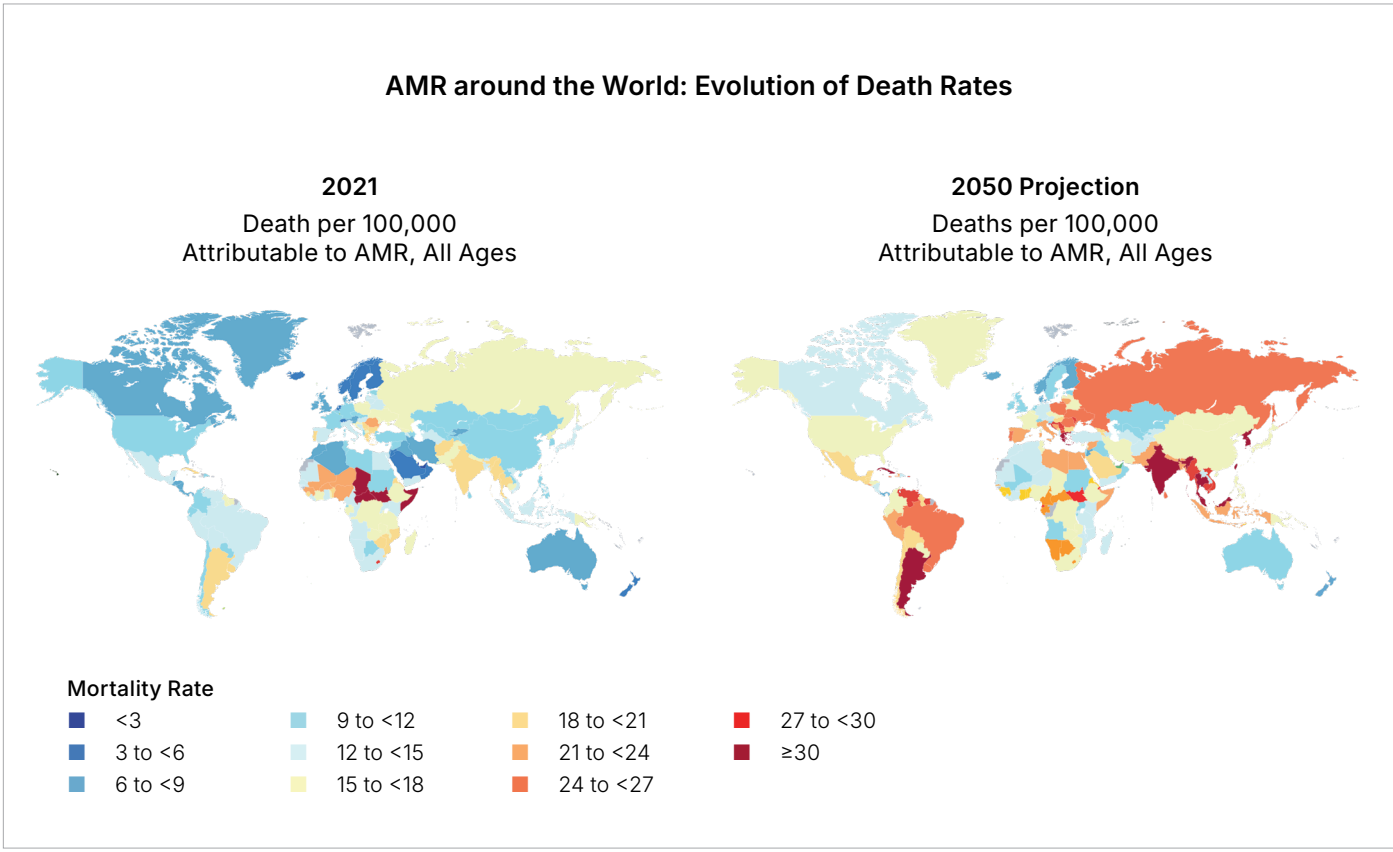
Bio-Rad offers optimized selective media, allowing a reliable growth of MRSA and VRE.

© 2025 Bio-Rad Laboratories, Inc.

AMR Detection and Surveillance

Accurate and timely detection of antimicrobial resistance is essential for effective patient care and public health. One of the biggest challenges in addressing AMR is the lack of diagnostic tools capable of rapidly identifying pathogens and their resistance profiles.

Swift identification of antibiotic resistance allows clinicians to choose the most appropriate antibiotics, reducing both treatment delays and the risk of complications.[5] Delayed antibiotic administration is linked to increased mortality, prolonged hospital stays, and greater healthcare costs.[6,7] Ultimately, faster and more accurate AMR diagnostics are vital for ensuring the right treatment at the right time, improving patient care while curbing the spread of resistance.



(Naghavi M et al., 2024)

Bio-Rad provides a comprehensive range of solutions for AMR detection and surveillance. Our tools deliver consistent, high-quality results so laboratories can help clinicians make informed treatment decisions, strengthening infection control and improving patient care.

© 2025 Bio-Rad Laboratories, Inc.

Bacterial Resistance Testing — Easier Than Ever

Bio-Rad β LACTA and β CARBA tests are designed for simplicity. These colorimetric tests are fast, affordable, and simple, making them an ideal choice for clinical laboratories looking to streamline their processes. The tests can be used directly on positive blood cultures, urine samples, or isolated colonies.

Extended-spectrum β-lactamase (ESBL) and carbapenemase-producing microorganisms are classified as high-priority pathogens by WHO and should be screened and searched for systematically.

β LACTA Test

Detects *Enterobacteriaceae* with decreased susceptibility to third-generation cephalosporins due to the production of ESBL





β CARBA Test

Detects *Enterobacteriaceae* with decreased susceptibility to carbapenems due to the production of carbapenemases





Simple Procedure

Both tests can be performed at the bench with no special instrumentation and minimal steps for faster turnaround times.

Rapid Results

Clinicians can adapt antibiotic treatment strategies quickly and efficiently. The β LACTA test provides results in 2-15 minutes while the β CARBA test is performed in 30 minutes.

High Sensitivity and Specificity

β LACTA test performance for ESBL detection:

- 92.7–95.7% sensitivity, depending on the specimen[8-10]
- 100% specificity[8-10]

β CARBA test performance for CPE* detection:

- 94% sensitivity for most frequent carbapenemases (KPC, VIM, OXA-48, NDM)[11]
- 98% specificity[11]

The tests showed 100% agreement with the reference method when tested directly on positive blood culture or urine samples.

*CPE, carbapenemase-producing *Enterobacteriaceae*.

© 2025 Bio-Rad Laboratories, Inc.

AST Disks — High Quality Meets Convenience

Bio-Rad AST Disks offer exceptional convenience in your antimicrobial susceptibility testing (AST). They are compliant with EUCAST, CLSI, and CA-SFM/EUCAST guidelines.



AST Disk portfolio includes ~100 options and is updated regularly

Customize your panel according to local practices and needs

Reliable Disk Storage

Bio-Rad AST Disks can be stored at 2–8°C — far simpler to manage than products requiring freezing temperatures — and remain stable for up to 6 weeks in use. Additionally, among the ~100 disk options available, 95% have a shelf life of more than 18 months. Stock up confidently and ensure you always have reliable disks on hand.

Easy Identification

Each disk is printed with a colored antibiotic code on both sides, and each cartridge features a colored label corresponding to antibiotic classes, making it easy to quickly identify the disks and antibiotic class you need, and to read the AST plate.

Proven Quality

In a 2017 study, EUCAST evaluated and confirmed the high-quality performance of Bio-Rad disks.[1,2] Have confidence every day that your lab is using trustworthy products.

Disk Options for ESBL Detection

Bio-Rad provides specific antibiotic disks combining third-generation cephalosporin and inhibitors for the detection of Enterobacterales strains with an ESBL resistance phenotype. The disks follow international guidelines and recommendations.

© 2025 Bio-Rad Laboratories, Inc.

Complete Your AST Setup with Culture Media and Disk Dispensers

In addition to AST Disks, Bio-Rad offers Mueller-Hinton Agar Media and disk dispensers. Combine all these essential tools for seamless, reliable testing.



AST Disks



AST Culture Media

Testing You Can Trust

Ensure the highest standards for your AST processes. Bio-Rad Mueller-Hinton Agars are non-selective media compliant with ISO 16782, WHO, CLSI, and EUCAST and/or CA-SFM/EUCAST standards and recommendations.

In a 2020 EUCAST study, Bio-Rad Mueller-Hinton Agars demonstrated excellent performance, with ≥99% of zone diameter readings within QC ranges and ≥70% on target ±1 mm.[13]

With Bio-Rad culture media, your lab can have confidence in every test.



AST Disk Dispensers

More Disks, Less Work

The Bio-Rad 7-Disk Dispenser can distribute seven disks on a round plate. For even greater testing capacity, the 12/16-Disk Dispenser distributes 16 disks on a square plate or 12 disks on a large round plate, increasing testing throughput.

Bio-Rad's dispensers simplify AST testing by enabling you to distribute more disks at one time for optimized, consistent placement. This creates the optimum conditions for reading and interpreting inhibition zones.

Compliant with EUCAST, CLSI, and CA-SFM/EUCAST

© 2025 Bio-Rad Laboratories, Inc.

Simplified Yeast and Urogenital Mycoplasma Susceptibility Testing

The FUNGITEST Kit and S.I.R. Mycoplasma Kit provide clear, easy-to-interpret results for specialty testing and complex microbial issues. Test for specific pathogens with precision and streamline your operations.

The kits are easy to use with no specialized training or equipment, and their color-coded results are simple to interpret. This allows your lab to perform tests quickly and accurately.

FUNGITEST Kit*

Yeast Susceptibility Testing

The wells of the kit contain six antifungal agents: amphotericin B, 5-fluorocytosine, fluconazole, itraconazole, ketoconazole, and miconazole.



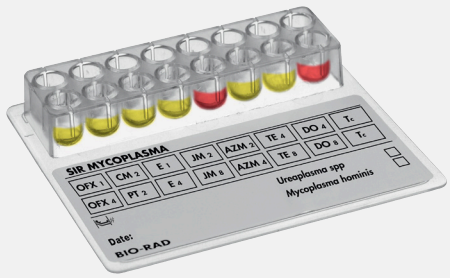
Reading and interpretation for *Cryptococcus neoformans* (72 hr at 32°C) and for other yeasts (48 hr at 37°C)

Growth No growth

S.I.R Mycoplasma Kit*

Urogenital Mycoplasma Susceptibility Testing

The wells of the kit contain eight antibiotics: doxycycline, tetracycline, azithromycin, clindamycin, josamycin, erythromycin, pristinamycin, and ofloxacin.



Reading and interpretation for urogenital *Mycoplasma hominis* (Mh) and *Ureaplasma* spp. (24–48 hr at 37°C)

Growth No growth

***The FUNGITEST Kit and S.I.R Mycoplasma Kit are not CE-marked.**

© 2025 Bio-Rad Laboratories, Inc.

Fighting Antimicrobial Resistance Together



Is your lab equipped to tackle the growing challenge of antimicrobial resistance?

Bio-Rad is committed to providing trusted solutions that strengthen your lab's ability to detect and respond to antimicrobial resistance. Together, we can tackle this global issue, drive better patient care, and make a powerful impact on public health.

Visit bio-rad.com/antimicrobial-resistance-testing for more information.

References

1. World Health Organization (2023). Antimicrobial resistance. https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance, accessed April 16, 2025.
2. Naghavi M et al. (2024). Global burden of bacterial antimicrobial resistance 1990–2021: A systematic analysis with forecasts to 2050. Lancet 404, 1199–1226.
3. World Health Organization. Infection prevention and control. https://www.who.int/health-topics/infection-prevention-and-control, accessed May 7, 2025.
4. World Health Organization (2022). Global report on infection prevention and control. https://www.who.int/publications/i/item/9789240051164, accessed May 7, 2025.
5. Zakhour J et al (2023). Diagnostic stewardship in infectious diseases: a continuum of antimicrobial stewardship in the fight against antimicrobial resistance. Int J Antimicrob Agents 62, 106816.
6. Yamin D et al (2023). Current and future technologies for the detection of antibiotic-resistant bacteria. Diagnostics (Basel) 13, 3246.
7. Kaprou GD et al (2021). Rapid methods for antimicrobial resistance diagnostics. Antibiotics (Basel) 10, 209.
8. Morosini MI et al (2014). Rapid detection of β-lactamase-hydrolyzing extended-spectrum cephalosporins in Enterobacteriaceae by use of the new chromogenic βLacta test. J Clin Microbiol 52, 1741–1744.
9. Walewski V et al (2015). Early detection with the β-LACTA™ test of extended-spectrum β-lactamase-producing Enterobacteriaceae in blood cultures. Diagn Microbiol Infect Dis 83, 216–218.
10. Gallah S et al (2014). The β-Lacta test for direct detection of extended-spectrum-β-lactamase-producing Enterobacteriaceae in urine. J Clin Microbiol 52, 3792–3794.
11. Bio-Rad Laboratories (2020). β CARBA test. https://downloads.bio-rad.com/CDX/GB/ALL?keycode=biorad0001299, accessed June 18, 2025.
12. Ahman J et al. (2019). The quality of antimicrobial discs from nine manufacturers—EUCAST evaluations in 2014 and 2017. Clin Microbiol Infect 25, 346–352.
13. Ahman J et al. (2020). EUCAST evaluation of 21 brands of Mueller–Hinton dehydrated media for disc diffusion testing. Clin Microbiol Infect 26, 1412.e1–1412.e5.

Ordering Information

MDRO Screening & Surveillance

Catalog No.	Description	
63757	MRSASelect II	20 plates of 90 mm
63759	MRSASelect II	100 plates of 90 mm
63751	VRESelect.	20 plates of 90 mm
63752	VRESelect.	100 plates of 90 mm

© 2025 Bio-Rad Laboratories, Inc.

Ordering Information

Resistance Mechanism Testing

Catalog No.	Description	
68250	β LACTA Test	50 tests
68260	β CARBA Test	25 tests

AST Culture Media

Catalog No.	Description	
63824	Mueller-Hinton Agar	20 plates of 90 mm
63901	Mueller-Hinton Agar	10 square plates of 120 mm
64884	Mueller-Hinton Agar	500 g
64888	Mueller-Hinton Agar	5 kg
63524	Mueller-Hinton-F Agar	20 plates of 90 mm
63525	Mueller-Hinton-F Agar	10 square plates of 120 mm
63825	Mueller-Hinton Agar + Sheep Blood	20 plates of 90 mm
63902	Mueller-Hinton Agar + Sheep Blood	10 square plates of 120 mm

AST Disks

Catalog No.	Description	
See list	Antibiotic Disks	4 x 50 disks
See list	Antibiotic Disks for ESBL detection	4 x 50 disks
66100*	Non Impregnated Paper Disks	1,000 disks
66101*	Non Impregnated Paper Disks	4 x 50 disks

AST Disks Dispenser

Catalog No.	Description	
50294*	7-Disk Dispenser	1 unit
50295*	12/16-Disk Dispenser	1 unit
50291*	Colored Desiccant Capsule	6 units
50292*	Adhesive labels with Bio-Rad disk abbreviations	20 sheets

Yeast Susceptibility Testing

Catalog No.	Description	
60780*	FUNGITEST Kit	10 tests
56499	Opacity Standard Kit for *AuxaColor*™ 2, FUNGITEST	2 vials

Urogenital Mycoplasma Susceptibility Testing

Catalog No.	Description	
62781*	S.I.R. Mycoplasma Kit	10 tests
62763*	Arginine Broth	Ampules 10 x 2 mL
62762*	U9 Urea Broth	Ampules 10 x 2 mL

*Not CE-marked.

Bio-Rad is a trademark of Bio-Rad Laboratories, Inc.
AUXACOLOR, β LACTA, FUNGITEST, and MRSASelect are trademarks of Bio-Rad Europe GmbH in certain jurisdictions.
All trademarks used herein are the property of their respective owner.

Bio-Rad Laboratories, Inc.

Clinical Diagnostics Group

Website www.bio-rad.com/diagnostics **Australia** +61(2) 9914 2800 **Austria** +43 (0) 1 877 89 01 9 **Belgium** +32 (0) 3 710 53 00 **Brazil** +55 11 3065 7550 **Canada** +1 514 334 4372 **China** +86 (21) 61698500 **Czech Republic** +420 241 431 660 **Denmark** +45 44 52 10 00 **Finland** +358 9 804 22 00 **France** +33 (0) 1 47 95 60 00 **Germany** +49 (0) 89 31884 393 **Greece** +30 210 7774396 **Hong Kong** +852 27893300 **Hungary** +36 1 459 6190 **India** +91 (124) 4029300 **Israel** +972 03 963 6025 **Italy** +39 024 94 86 600 **Japan** +81 3 6361 7070 **Mexico** +52 (55) 5488 7670 **The Netherlands** +31 (0) 318 540 666 **New Zealand** +64 (9) 415 2280 **Norway** +47 23 38 41 30 **Poland** +48 22 331 99 99 **Portugal** +351 214 727 700 **Republic of Korea** +82 080 007 7373 **Russia** +7 (495) 721-14-04 **Singapore** +65 6415 3170 **South Africa** +27 010 055 8040 **Spain** +34 91 49 06 580 **Sweden** +46 844 98053 **Switzerland** +41 (0) 61 717 9555 **Taiwan** +886 (2) 25787189 **Thailand** +66 (2) 6518311 **United Kingdom** +44 (0) 1923 471301

© 2025 Bio-Rad Laboratories, Inc. 25-116550 2025/08