BD

Helping all people
live healthy lives

Optimal Patient Care

Superior diagnosis of sepsis thanks to effective removal of antibiotics

It's what's inside
that counts!

BD BACTEC™ PLUS Resin Media

Optimal patient care demands the best performing blood culture medium

With more focus on sepsis and increasing challenges due to antimicrobial resistance, it is more important than ever for hospitals to accurately diagnose and treat septic patients. Choosing the most sensitive blood culturing system and media type helps clinicians make quick, precise diagnoses and initiate appropriate treatment options, resulting in better patient outcomes and hence reduced length of stay.

According to the "Surviving Sepsis Campaign", it is recommended to obtain appropriate cultures before starting antibiotics provided this does not significantly delay antimicrobial administration [1]. However, one of the greatest challenges in blood culture is the fact that among patients from whom blood cultures have been obtained, 28-63% are on antibiotic therapy at the time of blood draw. This can negatively affect the recovery of the etiologic agent [2].

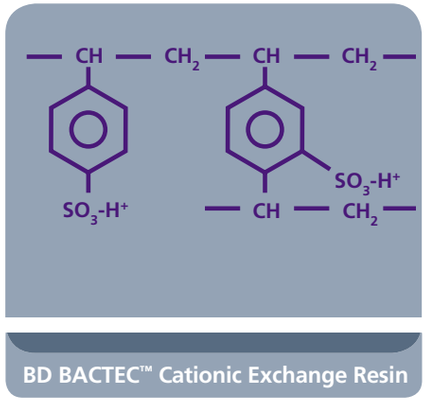
culture bugs
...not drugs

Therefore, it is of paramount importance to use a blood culture system that efficiently neutralises the effect of antibiotics in general, and of ß-lactams in particular [3].

BD BACTEC™ PLUS Resin Media

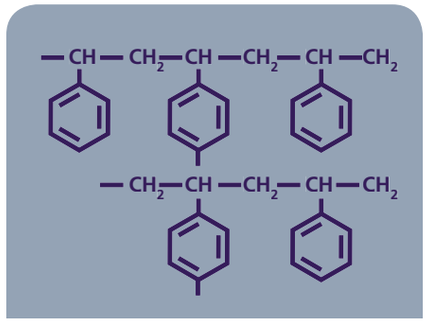
Experience the resin power

Effective and fast antibiotic neutralization

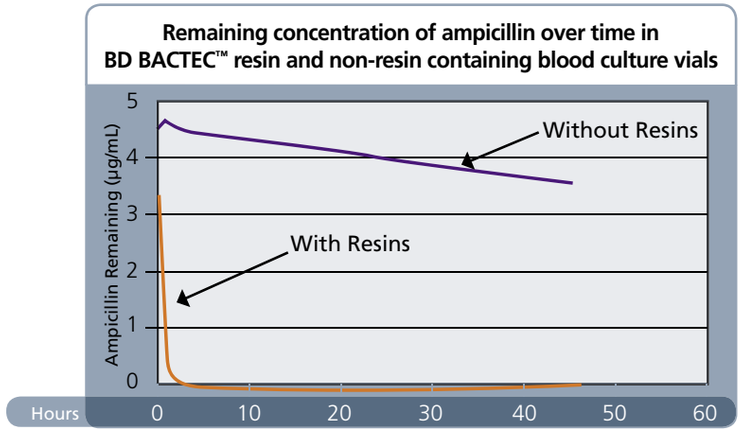


BD BACTEC™ Cationic Exchange Resin

The strong cationic exchange resins bind ionically to positively charged antimicrobials like aminoglycosides.
The polymeric adsorbent resins are capable of binding to the hydrophobic regions of virtually any antimicrobial agent [4].



BD BACTEC™ Polymeric Adsorbent Resin



- Resin-containing BD BACTEC™ PLUS Aerobic/F vials can rapidly and effectively reduce the concentrations of a wide range of generally used antibiotics in culture broth [4].
- In general, resins decrease antibiotic activity in the medium by 90% within 1 to 2 h after incubation [4].
- Even at very high concentrations antibiotic binding saturation is not observed [4].

Don't compromise on quality

Go for PLUS
Go for Resins!

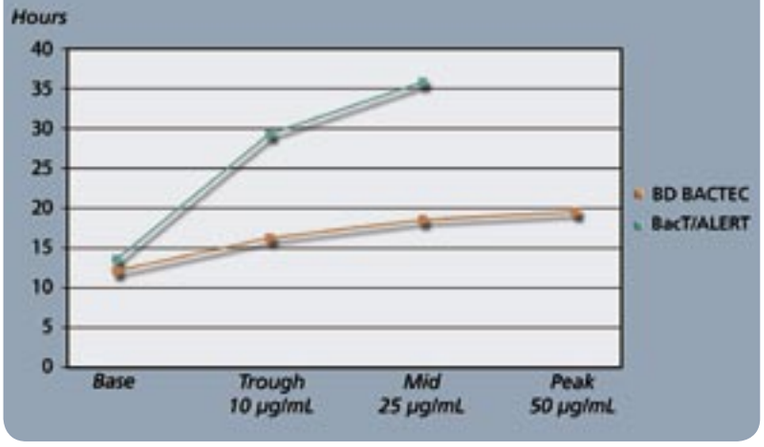
BD BACTEC™ PLUS Resin Media

Leading sepsis detection rates

- **Proven best recovery and shortest time to detection when tested with several drugs [3]**

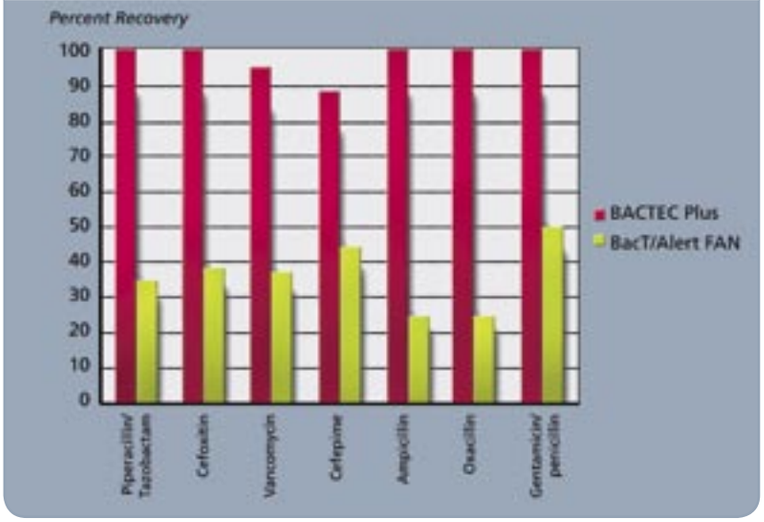
  This study demonstrates the superiority of the BACTEC™ PLUS system compared to the BacT/ALERT® FAN system in recovering gram-positive pathogens in the presence of vancomycin [5].

Time To Detection based on vancomycin concentrations [5]



- **Proven best recovery in the presence of vancomycin and ß-lactam drugs with therapeutical achievable concentrations [2]**

Percent recovery of control and challenge organisms in BACTEC™ PLUS and BacT/Alert® FA bottles containing antibiotics [1]



Proven effective neutralization of antimicrobials compared to other systems

- Under these simulated conditions, the BACTEC™ PLUS system was superior to the BacT/Alert® FA system in recovering GP and GN bacterial pathogens in the presence of ß-lactam antibiotics, gentamicin/ penicillin, and vancomycin [2].
- For hospitals using the BACTEC™ PLUS system, the timing for collection of blood cultures is not as critical for optimal recovery of pathogens due to the efficient binding of antibiotics by the resins in the medium [2].
- BACTEC™ PLUS system recovers more pathogens with shorter time to detection than the BacT/ALERT® FAN system when ß-lactam antibiotics are present at their respective trough concentration corresponding to parenteral therapy [3].
- This study demonstrates the ability of the BACTEC™ PLUS system to recover commonly isolated bacterial pathogens more efficiently than the TREK system in the presence of antibiotics [6].

- In this study the BD BACTEC™ resin-containing media demonstrated an overall greater recovery of *S. aureus* ATCC strains than Versa TREK REDOX I media in the presence of vancomycin daptomycin and linezolid and a decreased TTD of organisms in the presence of each of the antibiotics, regardless of the concentration [7].
- Superior recovery of pathogens from blood with an unmatched false negative rate of 0.03% [8] and false positive rate of 0.1% [9].
- No interference with Gram stain readings – improves workflow and reporting time [11],[13].
- Increasing hospital revenues (DRG reimbursements) as a result of enhanced recovery of significant pathogens associated with septicemia [12].

BD BACTEC™ PLUS Aerobic/F

Publicly-available resin performance data

NEW Enhanced medium

BD, the leader in blood culture instrumentation and media for the last 40 years, continues to provide your laboratory with new solutions in blood culturing. We are consistently striving for continuous improvement of our media formulations and software algorithms. The BD BACTEC™ PLUS Aerobic/F has been further improved to enhance the performance for the time to detection and recovery of yeasts.

- Medium enhancements include slight changes to ingredients, an increase in fill volume (from 25 mL to 30 mL) and modification of an algorithm for detection of slow growing micro-organisms (i.e. yeasts)
- Recommended blood fill volumes remain the same: 3-10 mL (range) and 8-10 mL (optimal)
- Enhancement will not change the current claims or intended use of the BD BACTEC™ PLUS Aerobic/F medium.

The best gets

even better!

Antimicrobial Class	Drug or Sub-class
ß-lactams	penicillin, flucloxacillin, ampicillin, oxacillin, piperacillin-tazobactam
	cephalosporins (see below table)
Glycopeptides	vancomycin, teicoplanin
Lipopeptides	daptomycin
Glycylcycline	tigecycline
Streptogramins	quinupristin/dalfopristin
Aminoglycosides	gentamicin, amikacin
Oxazolidinones	linezolid
Macrolides	azithromycin
Lincosamides	clarithromycin
Quinolones	ciprofloxacin, levofloxacin, sparfloxacin, gatifloxacin, garenoxacin, gemifloxacin and moxifloxacin
Tetracyclines	doxycycline, etc.
Folate synthesis inhibitors	TMP-SMX
Polymyxins	polymyxin B
Antifungals	amphotericin B (solubilized and lipid complex), voriconazole, etoconazole, and itraconazole, griseofulvin, flucytosine
Cephalosporins	cefotaxime
	cefotetan
	cefamandole
	cefuroxime
	ceftizoxime
	ceftazidime
	cefixime
	cefoperazone
	cefepime
	cefazolin
	cefoxitin
	ceftriaxone

Other Drugs	Drug
Anticancer and Immunosuppressive Drugs	actinomycin D
	doxorubicin
	etoposide
	mithramycin
	mitomycin C

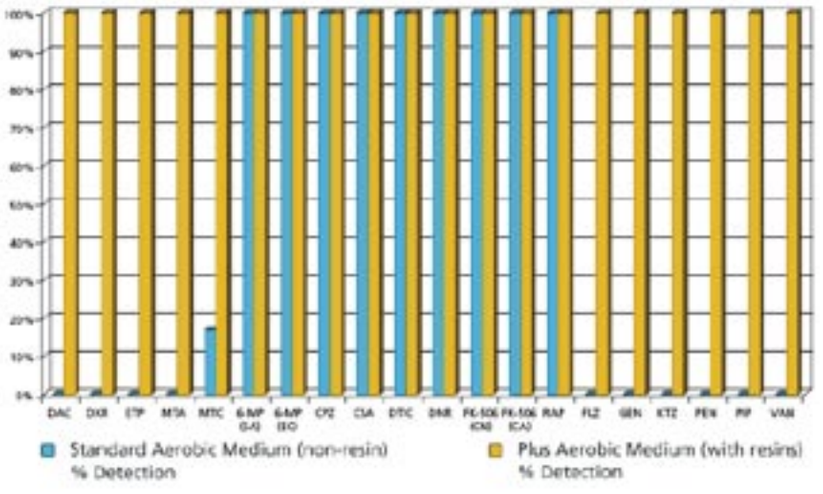
BD BACTEC™ PLUS Resin Media

Powerful in neutralizing more than antibiotics

Adsorption of Anticancer and Immunosuppressive Drugs by BD BACTEC™ PLUS Resin Media

- BD BACTEC™ PLUS resin media prevented recovery failures caused by the antimicrobial activities of anticancer and immunosuppressive drugs that can be carried over into blood culture bottles [13].
- BD BACTEC™ PLUS media resins also prevented recovery failures caused by synergistic combinations of traditional antimicrobials and anticancer/ immunosuppressive agents in amounts that individually would be sub-inhibitory [13].
- Actinomycin D, doxorubicin, etoposide, mithramycin, and mitomycin C all exhibited potent antimicrobial activities in blood culture media without resins present. Antimicrobial activities were not observed from 6-mercaptopurine, chlorpromazine, cyclosporin A, dacarbazine, daunorubicin, FK-506, or rapamycin [13].

Detection rates in growth media with and without resins



Chemotherapeutic agents employed in this study [13]:
DAC: Actinomycin D; DXR: Doxorubicin; ETP: Etoposide; MTA: Mithramycin A; MTC: Mitomycin C; 6-MP: 6-mercaptopurine; CPZ: Chlorpromazine; CSA: Cyclosporin A; DTIC; Dacarbazine; DNR: Daunorubicin; FK-506 Tacrolimus; RAP: Rapamycin; FLZ: Fluconazole; GEN: Gentamicin; KTZ: Ketoconazole; PEN: Penicillin G; PIP: Piperacillin; VAN: Vancomycin

	Medium	Application	Blood Volume	Resin Concentration
PLUS Aerobic/F	Enriched soybean-casein digest broth. Aerobic atmosphere enriched with CO_2.	Recovery of aerobic bacteria, yeasts and fungi from blood or sterile body fluids. Recommended over other media for patients already under antimicrobial therapy.	Range: 3 - 10 mL Optimal: 8 – 10 mL	Nonionic Adsorbing Resin: 16.0% w/v Cationic Exchange Resin: 1.0% w/v
PLUS Anaerobic/F	Pre-reduced enriched soybean-casein digest broth. Anaerobic atmosphere enriched with CO_2.	Recovery of obligate and facultative anaerobic bacteria from blood or sterile body fluids. Recommended over other media for patients already under antimicrobial therapy.	Range: 3 - 10 mL Optimal: 8 – 10 mL	Nonionic Adsorbing Resin: 16.0% w/v Cationic Exchange Resin: 1.0% w/v
PEDS PLUS/F	Enriched soybean-casein digest broth. Aerobic atmosphere enriched with CO_2.	Recovery of aerobic bacteria, yeasts and fungi from pediatric patients or other low volume blood or sterile body fluids. Recommended over other media for patients already under antimicrobial therapy.	Range: 0.5 - 5.0 mL Optimal: 1 - 3 mL	Nonionic Adsorbing Resin: 10.0% w/v Cationic Exchange Resin: 0.6% w/v

BD BACTEC™ Twinset

A unique and powerful combination

- A pair of one BD BACTEC™ PLUS Aerobic/F and one BD BACTEC™ PLUS Anaerobic/F vial in one conveniently packaged set (25 sets per box).
- Helps to ensure the collection of blood culture sets and thus sufficient volumes of blood.
- Streamlines the logistics of blood culture vial distribution on the wards.

References:

(1) Dellinger et al.: Crit Care Med 2008; 36:296-327
(2) Flayhart et al.: J. Clin. Microbiol. 2007, p. 816–821
(3) Vigano et al.: The New Microbiologica 2004, 27, 235-248
(4) Spaargaren et al. J. Clin. Microbiol. 1998, 36, 3731–3733
(5) Flayhart et al.: As presented at the 105th General Meeting of the American Society for Microbiology, 2005.
(6) Carrero et al.: Poster C-174, American Society for Microbiology Meeting 2008
(7) DiPersio et al.; Poster D-306, ICAAC 2008
(8) Eigner et al.: P 921 13th ECCMID 2003
(9) Durmaz et al. J. Clin. Microbiol. 2003, 41, 819-821
(10) Sorlin et al. J. Med. Microbiol. 2000, 49, 787 – 791
(11) Adler et al. J. Clin. Microbiol. 2003, 41, 5238–5239
(12) Whittier S.: 103rd General Meeting of the American Society for Microbiology, 2003`
(13) Pfeltz et al.: Abstract C-026, Poster Board #0247, American Society for Microbiology Meeting 2008

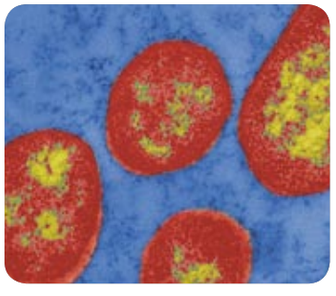
Superior tools in sepsis diagnosis

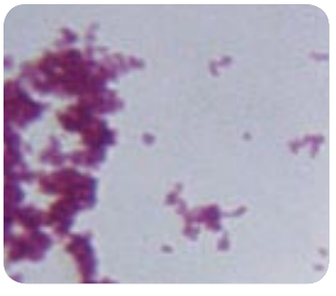
from specimen collection to actionable results!

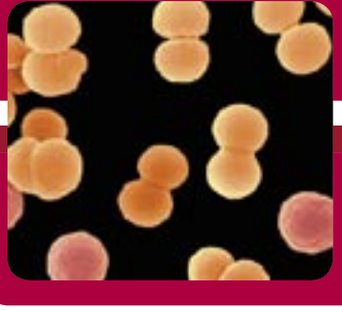
The BD BACTEC™ Culture Club

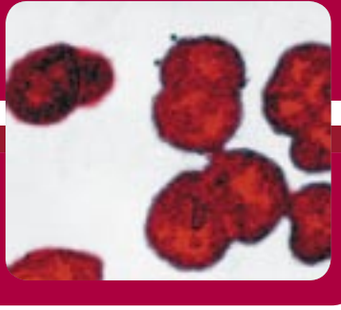
- The BD BACTEC™ Culture Club was created to inform BD BACTEC™ Blood Culture System users of unusual organisms recovered from BD BACTEC™ 9000 series and BD BACTEC™ FX instruments and BD BACTEC™ media.
- As newly isolated organisms are reported to us, the reports are published in LabO™ and at http://www.bd.com/ds/CultureClub.
- More than 300 species have been reported so far!

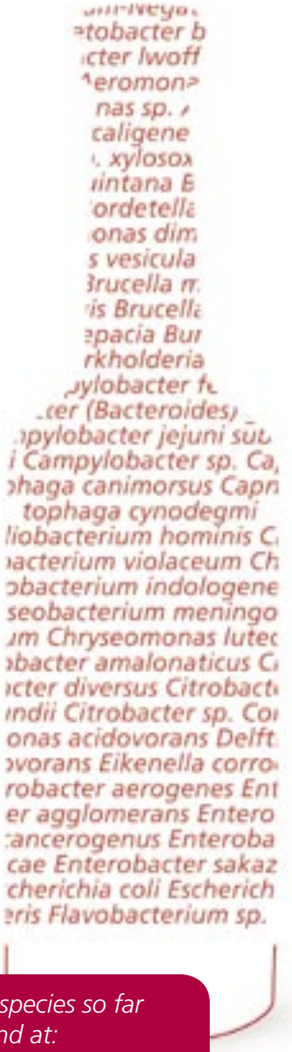
For more information on the BD BACTEC™ Culture Club and how to join it see **www.bd.com/ds/CultureClub**.











The complete list of species so far reported can be found at:
http://www.bd.com/ds/CultureClub

Come and join the Club!

Link to Business

BD Diagnostics
Tullastrasse 8-12
69126 Heidelberg
Germany
Tel. (49) 6221 305-0
Fax (49) 6221 305-216
www.BD .com