Optimal Patient Care

Superior diagnosis of sepsis thanks to effective removal of antibiotics

Optimal patient care demands the best performing blood culture medium

BD BACTEC™ PLUS Resin Media

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. 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.

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

It’s what’s inside that counts!

culture bugs
...not drugs
**BD BACTEC™ PLUS Resin Media**

**Experience the resin power**

**Effective and fast antibiotic neutralization**

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™ Cationic Exchange Resin**

**BD BACTEC™ Polymeric Adsorbent Resin**

Don’t compromise on quality

Go for PLUS Go for Resins!

- 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).
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, 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 microorganisms (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!

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**Antimicrobial Class** | **Drug or Sub-class**
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ß-lactams | penicillin, flucloxacillin, ampicillin, oxacillin, piperacillin-tazobactam
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, cefeltizoxime, ceftazidime, cefixime, cefoperazone, cefepime, cefazolin, cefoxitin, ceftriaxone
Other Drugs | Drug
Anticancer and Immunosuppressive Drugs | actinomycin D, doxorubicin, etoposide, mithramycin, mitomycin C
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).

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**Medium** | **Application** | **Blood Volume** | **Resin Concentration**
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**PLUS Aerobic/F** | Enriched soybean-casein digest broth. Aerobic atmosphere enriched with CO₂. 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 CO₂. 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 CO₂. 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

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
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
(3) Vigano et al.: The New Microbiologica 2004, 27, 235-248
(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
(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!