Interpreting GenMark's ePlex® Results

The Vanderbilt Microbiology Laboratory provides rapid diagnostic information on positive blood cultures with the goal of quickly tailoring therapy to provide the most potent antibiotic while limiting unnecessary toxicity.

Follow these steps to adjust antibiotic therapy based on ePlex® results and Vanderbilt antibiogram data:

1. Locate the appropriate table below (e.g., gram-positive cocci, gram-positive rod, gram-negative rod, or fungi)
2. Evaluate the organism and reported resistance marker
3. Follow preliminary recommendations as appropriate

ePlex® results should **never** supersede clinical judgement.

Continue to base therapy on careful history, physical, and available data (e.g., allergies, renal function, etc.) and remain aware that contaminated blood cultures are reported just as any other culture.

For additional information about using beta-lactams in patients with listed drug allergies, see linked references on the Vanderbilt Antimicrobial Stewardship Program website:

- Beta-lactam allergy assessment for hospitalized patients

Traditional culture data (i.e., speciation and susceptibility) will still be available in 2-3 days and remains the gold standard upon which final antibiotic recommendations are based.
Do not hesitate to consult Infectious Diseases (or page **615-317-GERM**) with questions

NOTE: If patient has a polymicrobial infection, ensure that coverage is adequate for all organisms. Recommendations below are specific to the organism identified only.

Gram-Positive Cocci		
Organism	**Resistance Marker**	**Recommendation**
Staphylococcus aureus	mecA NOT detected (MSSA)	Start cefazolin • Infectious Diseases consultation required • Stop empiric vancomycin IV
	mecA detected (MRSA)	Start/continue vancomycin IV • Infectious Diseases consultation required • Stop empiric gram-negative coverage
Staphylococcus lugdunensis	mecA NOT detected	Start cefazolin • Infectious Diseases consultation required • Stop empiric vancomycin IV
	mecA detected	Start/continue vancomycin IV • Infectious Diseases consultation required • Stop empiric gram-negative coverage
Staphylococcus epidermidis*	mecA NOT detected (MSSE)	Often skin contaminant Repeat blood cultures then start therapy if **uncertain**: • Start cefazolin • Stop empiric vancomycin IV
	mecA detected	Often skin contaminant

	(MRSE)	Repeat blood cultures then start therapy if **uncertain**: • Start/continue vancomycin IV • Stop empiric gram-negative coverage
Staphylococcus species*	mecA NOT detected	Often skin contaminant Repeat blood cultures then start therapy if **uncertain**: • Start cefazolin • Stop empiric vancomycin IV
	mecA detected	Often skin contaminant Repeat blood cultures then start therapy if **uncertain**: • Start/continue vancomycin IV • Stop empiric gram-negative coverage
Streptococcus agalactiae (GBS)		Start IV penicillin, ampicillin, or cefazolin • Stop empiric vancomycin IV and gram-negative coverage
Streptococcus anginosus group		
Streptococcus pyogenes (GAS)		
Streptococcus pneumoniae		Start/continue ceftriaxone • If concern for **meningitis** continue vancomycin IV, otherwise, stop empiric vancomycin
Other *Streptococcus* spp.*		May be a contaminant Correlate clinically before starting antibiotics • Start/continue ceftriaxone • Stop empiric vancomycin IV
Enterococcus faecalis	vanA/vanB NOT detected	Start ampicillin • Infectious Diseases consultation required • Stop empiric vancomycin IV
	vanA/vanB detected (VRE)	Start ampicillin • Do **not** use vancomycin IV • Infectious Diseases consultation required
Enterococcus faecium	vanA/vanB NOT detected	Start vancomycin IV • Infectious Diseases consultation required • Stop empiric gram-negative coverage
	vanA/vanB detected (VRE)	Start daptomycin • Do **not** use vancomycin IV • Infectious Diseases consultation required
Micrococcus*		*Micrococcus* in a single blood culture generally represents skin flora contamination Repeat blood cultures then start therapy if **uncertain**: • Start vancomycin IV

*These organisms may represent blood culture contamination, especially if found in only a single blood culture set. Clinical correlation is recommended to evaluate need for antibiotics directed against this organism.

Use the algorithm on the VASP website to help determine when a blood culture with GPC is a pathogen or contaminant.

Gram-Positive Rod	
Organism	**Recommendation**
Listeria monocytogenes	Start ampicillin • Stop empiric vancomycin IV
Bacillus cereus* ***Bacillus subtilis****	*Bacillus* in a single blood culture generally represents skin flora contamination Repeat blood cultures then start therapy if **uncertain**: • Start vancomycin IV
Corynebacterium*	*Corynebacterium* in a single blood culture generally represents skin flora contamination Repeat blood cultures then start therapy if **uncertain**: • Start vancomycin IV
Cutibacterium acnes* ***(Propionibacterium acnes)***	*Cutibacterium* in a single blood culture generally represents skin flora contamination Repeat blood cultures then start therapy if **uncertain**: • Start penicillin IV
Lactobacillus*	*Lactobacillus* in a single blood culture generally represents skin flora contamination Repeat blood cultures then start therapy if **uncertain**: • Start penicillin IV

*These organisms may represent blood culture contamination, especially if found in only a single blood culture set. Clinical correlation is recommended to evaluate need for antibiotics directed against this organism.

NOTE: Recommendations below apply generally for all units in the hospital. Refer to the VUMC antibiogram for susceptibilities of selected organisms by unit or anatomic site (VUMC Antibiogram)
****If no MRSA recovered in blood cultures and MRSA not recovered or expected from other sites, empiric anti-MRSA treatment (e.g. vancomycin) should be discontinued.**

Gram-Negative Rod	
Organism	**Recommendation**
Acinetobacter baumannii	• Start ampicillin/sulbactam
Bacteroides fragilis	• Start/continue metronidazole • If polymicrobial infection, piperacillin/tazobactam, ampicillin/sulbactam, or meropenem based on other organisms • Do NOT double cover anaerobes
Citrobacter spp.	• Start/continue cefepime
Cronobacter sakazakii	• Start/continue cefepime
Enterobacter (non-cloacae complex)	• Start/continue cefepime
Enterobacter cloacae complex	• Start/continue cefepime
Escherichia coli (no CTX-M)	• Start/continue ceftriaxone
Fusobacterium nucleatum ***Fusobacterium necrophorum***	• Start ampicillin/sulbactam or start/continue metronidazole
Haemophilus influenzae	• Start/continue ceftriaxone or ampicillin/sulbactam
Klebsiella oxytoca (no CTX-M)	• Start/continue ceftriaxone
Klebsiella pneumoniae (no CTX-M)	• Start/continue ceftriaxone
Morganella morganii	• Start/continue cefepime
Neisseria meningitidis	• Start/continue ceftriaxone
***Proteus* spp.**	• Start/continue cefepime
Proteus mirabilis (no CTX-M)	• Start/continue ceftriaxone
Pseudomonas aeruginosa	• Start/continue cefepime or piperacillin-tazobactam
Salmonella spp.	• Start/continue ceftriaxone
Serratia spp. ***Serratia marcescens***	• Start/continue cefepime
Stenotrophomonas maltophilia	• Start trimethoprim-sulfamethoxazole (12-15mg/kg/day divided q8h for normal renal function) AND minocycline 200mg q12h
Gram-Negative Resistance Genes*	
CTX-M Positive (ESBL)	• Start meropenem (page 317-GERM for approval) • Do not use cefepime or piperacillin/tazobactam • Consider an Infectious Diseases consult
IMP Positive **KPC Positive** **NDM Positive** **OXA (OXA-23 and OXA-48) Positive** **VIM Positive**	Carbapenemase-producing organism • Obtain Infectious Disease consultation

*These recommendations supersede the ones in the top part of this table.

Fungi	
Organism	**Recommendation**
Candida albicans	• Start micafungin for any *Candida* spp. (page 317-GERM for approval) • Infectious Disease consultation is required
Candida dubliniensis	
Candida parapsilosis	
Candida tropicalis	
Candida auris	
Candida glabrata	
Candida guilliermondii	
Candida kefyr	
Candida krusei	
Candida lusitaniae	
Candida famata	
Cryptococcus gattii ***Cryptococcus neoformans***	
Fusarium	
Rhodotorula	