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Notes

In vitro activity of telavancin and comparator antimicrobial agents against a panel of genetically defined staphylococci☆

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Abstract

The in vitro activity of telavancin was determined for 94 diverse *Staphylococcus* spp. Telavancin had MIC_{90} values of 0.5 μg/mL for methicillin-susceptible, methicillin-resistant, and vancomycin-susceptible *Staphylococcus aureus*, and coagulase-negative staphylococci isolates. Telavancin MICs were 0.5–1 μg/mL for vancomycin-intermediate *S. aureus* isolates and 2–4 μg/mL for vancomycin-resistant *S. aureus* strains.

Keywords: *Staphylococcus aureus*; Telavancin; In vitro activity

Infections caused by multidrug-resistant Gram-positive organisms, such as methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-intermediate *S. aureus* (VISA), and vancomycin-resistant *S. aureus* (VRSA) represent a growing public health threat worldwide (Bell Turnidge, 2002; Courvalin, 2006; National Nosocomial Infections Surveillance System, 2004; Veldhuijzen et al., 2000). While the risk of infection by multidrug-resistant pathogens has increased over the last 20 years, the development of new antibacterial agents has declined (Spellberg et al., 2004) such that the empiric therapy options for treating infections caused by these organisms are limited.

Telavancin is a lipoglycopeptide antimicrobial with potent bactericidal activity in vitro and in vivo against Gram-positive bacteria including methicillin-susceptible *S. aureus* (MSSA), MRSA, heterogeneous VISA, VISA, and multidrug-resistant streptococci and enterococci (Draghi et al., 2008a, 2008b; Hegde et al., 2004; Krause et al., 2008; Reyes et al., 2005, 2006). Telavancin is approved in the United States and Canada for the treatment of complicated skin and skin structure infections (cSSSI) caused by susceptible Gram-positive bacteria in adult patients. Telavancin is under regulatory review for the treatment of nosocomial pneumonia (NP) in the USA, and for cSSSI and NP in Europe.

We describe the results of broth microdilution susceptibility testing of telavancin and 5 comparator antimicrobial agents (vancomycin, teicoplanin, daptomycin, tigecycline, and linezolid) against a unique panel of 94 staphylococcal strains. These strains were chosen to represent established and emerging antimicrobial resistance genotypes and phenotypes, epidemic clones found throughout the world, the primary staphylococcal toxins and virulence factors encountered clinically, and recent clinical isolates from patients in Europe and the United States.

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Table 1
Characteristics and telavancin MIC of tested strains

Organism	Isolate and relevant attribute(s)	Telavancin MIC (μg/mL)
S. aureus (MSSA)	GPRP001[a]; quinupristin/dalfopristin-resistant pneumonia isolate	0.25
	GPRP007; intensive care unit, endotracheal aspirate isolate	0.25
	GPRP009; bone marrow transplant unit, blood isolate	0.25
	GPRP026; endocarditis, blood isolate	0.25
	GPRP034; wound isolate	0.25
	GPRP035; abdominal wall abscess isolate	0.25
	GPRP041; quinupristin/dalfopristin-resistant	0.25
	RN1389[b]; erythromycin-resistant [*erm*(A)]	0.5
	RN4220[b]; erythromycin-resistant [*erm*(C)]	0.5
	NRS102 [c]; produces capsular polysaccharide 5	0.25
	NRS103; produces capsular polysaccharide 8	0.25
	NRS104; overexpression of protein A	0.25
	NRS105; protein A-deficient	0.5
	NRS109; produces enterotoxin (*sec*2)	0.25
	NRS110; produces enterotoxins (*sed*, *seg*, *sei*, *sej*)	0.25
	NRS111; produces enterotoxins (*sea*, *sec*3, *see*) and TSST-1 (*tsst*-1)	0.25
	NRS112; produces TSST-1 (*tsst*-1)	0.25
	NRS113; produces enterotoxins (*sec*1, *seg*, *seh*, *sei*)	0.5
	NRS114; produces enterotoxin (*she*)	0.25
	NRS156; produces enterotoxin (*egc*), *agr*2	0.25
	NRS157; produces enterotoxin (*egc*), *pvl*, *agr*1	0.25
	NRS158; produces enterotoxins (*egc*, *seb*) *pvl*, *agr*1	0.25
	NRS161; produces enterotoxin (*egc*), *pvl*, *agr*1	0.25
	NRS162; produces enterotoxins (*egc*, *sea*, *tst*), *pvl*, *agr*3	0.25
	NRS164; produces enterotoxins (*eta*, *pvl*, *hla*, *hld*, *hlgv*), *agr*2	0.25
	NRS166; associated with exfoliative toxin-mediated disease	0.5
	NRS174; associated with TSST-1-mediated toxic shock syndrome	0.25
	NRS180; associated with TSST-1–mediated scarlet fever	0.25
	NRS181; associated with suppurative endocarditis	0.25
	NRS184; associated with suppurative cellulitis and/or myositis	0.25
	NRS187; associated with suppurative osteitis and/or osteomyelitis	0.5
	NRS189; associated with suppurative arthritis	0.5
	NRS198; isolated in 1949	0.25
	NRS260; associated with abscess and Kawasaki syndrome	0.5
	NRS261; associated with recurrent necrotising pneumonia	0.5
	NRS264; associated with bacteraemia/abscesses	0.5
S. aureus (MRSA)	GPRP002; quinupristin/dalfopristin-resistant pneumonia isolate	0.25
	GPRP003; nosocomial cystitis, blood isolate	0.5
	GPRP004; intensive care unit, blood isolate	0.25
	GPRP016; nosocomial complicated urinary tract infection, urine isolate	0.25
	GPRP017; community-acquired pneumonia, blood isolate	0.25
	GPRP018; septicemia, blood isolate	0.5
	GPRP019; septicemia, blood isolate	0.5
	GPRP020; septicemia, blood isolate	0.25
	GPRP021; septicemia, blood isolate	0.25
	GPRP022; septicemia, blood isolate	0.25
	GPRP024; endocarditis, blood isolate	0.5
	GPRP036; wound infection isolate	0.25
	GPRP040; quinupristin/dalfopristin-resistant	0.25
	GPRP042	0.25
	EMRSA1[b]; SCC*mec* type 3	0.25
	EMRSA3[b]; SCC*mec* type 1	0.25
	EMRSA15[b]; SCC*mec* type 4	0.12
	EMRSA16[b]; SCC*mec* type 2	0.25
	NRS119; linezolid-nonsusceptible	0.25
	NRS120; linezolid-nonsusceptible	0.25
	NRS121; linezolid-nonsusceptible	0.5
	NRS123; clone type USA 400	0.25
	NRS127; linezolid-nonsusceptible	0.25
	NRS192; community-acquired pneumonia isolate, *pvl*	0.25
	NRS193; community-acquired isolate associated with necrotizing pneumonia and sepsis, *pvl*	0.25