

TABLE S1 The bactericidal effects of olanexidine against various bacterial strains by exposure time and minimal bactericidal concentration (MBC)*

Bacterial Strain	Minimal bactericidal concentration, µg/ml								
	Olanexidine gluconate			Chlorhexidine digluconate			Povidone iodine		
	30 s	60 s	180 s	30 s	60 s	180 s	30 s	60 s	180 s
<i>Kocuria varians</i> NBRC 3765	54.3	27.1	13.6	>313	>313	39.1	391	195	195
<i>Kytococcus sedentarius</i> NBRC 15357	434	109	27.1	39.1	9.8	9.8	781	391	391
<i>Micrococcus luteus</i> NBRC 12992	54.3	27.1	13.6	>313	>313	313	781	391	195
<i>Staphylococcus aureus</i> ATCC 6538	434	217	109	>1250	>1250	>1250	391	195	195
<i>Staphylococcus aureus</i> ATCC 6538P	869	434	434	>1250	>1250	>1250	781	391	391
<i>Staphylococcus aureus</i> ATCC 29213	869	434	109	>1250	>1250	>1250	391	391	195
<i>Staphylococcus aureus</i> ATCC 33591 (MRSA) [†]	434	109	109	2500	1250	156	391	391	195
<i>Staphylococcus aureus</i> ATCC 43300 (MRSA)	1740	869	434	>1250	>1250	>1250	781	391	391
<i>Staphylococcus capitis</i> ATCC 27840	54.3	13.6	≤6.8	>39.1	>39.1	>39.1	≤48.8	≤48.8	≤48.8
<i>Staphylococcus epidermidis</i> ATCC 12228	217	109	54.3	78.1	39.1	19.5	195	195	97.7
<i>Staphylococcus haemolyticus</i> ATCC 29970	27.1	13.6	13.6	1250	625	19.5	391	391	391
<i>Staphylococcus hominis</i> ATCC 27844	217	109	27.1	>313	>313	>313	391	391	391
<i>Staphylococcus saprophyticus</i> ATCC 15305	13.6	≤6.8	≤6.8	39.1	39.1	19.5	195	195	195
<i>Staphylococcus sciuri</i> ATCC 29060	27.1	13.6	≤6.8	>1250	1250	78.1	391	195	≤48.8
<i>Staphylococcus simulans</i> ATCC 27851	27.1	13.6	13.6	>1250	1250	313	391	391	97.7

Bacterial Strain	Minimal bactericidal concentration, µg/ml								
	Olanexidine gluconate			Chlorhexidine digluconate			Povidone iodine		
	30 s	60 s	180 s	30 s	60 s	180 s	30 s	60 s	180 s
<i>Staphylococcus warneri</i> ATCC 27836	217	54.3	13.6	>313	>313	>313	781	195	≤48.8
<i>Staphylococcus xylosus</i> ATCC 29971	217	27.1	≤6.8	2500	1250	78.1	391	391	97.7
<i>Streptococcus agalactiae</i> ATCC 12386	54.3	27.1	13.6	>625	>625	>625	781	781	391
<i>Streptococcus bovis</i> ATCC 33317	109	27.1	≤6.8	>1250	>1250	>1250	781	391	195
<i>Streptococcus pneumoniae</i> ATCC 49619	27.1	27.1	13.6	>2500	>2500	313	391	97.7	97.7
<i>Streptococcus pyogenes</i> ATCC 19615	27.1	13.6	27.1	>156	>156	>156	391	391	97.7
<i>Enterococcus avium</i> ATCC 14025	54.3	13.6	13.6	>1250	78.1	9.8	391	195	97.7
<i>Enterococcus avium</i> ATCC 49462	217	217	54.3	>2500	>2500	2500	781	781	391
<i>Enterococcus avium</i> ATCC 49463	54.3	13.6	13.6	>1250	>1250	>1250	781	391	195
<i>Enterococcus avium</i> ATCC 49465	217	109	27.1	>1250	>1250	>1250	781	781	391
<i>Enterococcus casseliflavus</i> ATCC 12817	27.1	13.6	13.6	>2500	>2500	>2500	>50000	>50000	391
<i>Enterococcus casseliflavus</i> ATCC 12818	217	54.3	13.6	>5000	>5000	>5000	>50000	50000	195
<i>Enterococcus casseliflavus</i> ATCC 700668	54.3	54.3	≤6.8	5000	5000	5000	>50000	25000	391
<i>Enterococcus casseliflavus</i> NBRC 100679	27.1	13.6	13.6	>2500	>2500	>2500	50000	391	195
<i>Enterococcus cecorum</i> ATCC BAA-597	109	27.1	13.6	>1250	>1250	>1250	781	391	195
<i>Enterococcus dispar</i> NBRC 100678	13.6	13.6	≤6.8	>1250	>1250	>1250	781	781	391
<i>Enterococcus faecalis</i> ATCC 29212	54.3	13.6	≤6.8	>5000	>5000	5000	>50000	>50000	1560

Bacterial Strain	Minimal bactericidal concentration, µg/ml								
	Olanexidine gluconate			Chlorhexidine digluconate			Povidone iodine		
	30 s	60 s	180 s	30 s	60 s	180 s	30 s	60 s	180 s
<i>Enterococcus faecalis</i> ATCC 49383	54.3	27.1	13.6	>5000	>5000	>5000	50000	50000	≤48.8
<i>Enterococcus faecalis</i> ATCC 49384	109	54.3	13.6	>5000	>5000	>5000	>50000	>50000	195
<i>Enterococcus faecalis</i> ATCC 49532	54.3	27.1	13.6	>5000	>5000	>5000	50000	50000	97.7
<i>Enterococcus faecalis</i> ATCC 49533	54.3	13.6	13.6	>5000	>5000	>5000	50000	50000	391
<i>Enterococcus faecalis</i> ATCC 51299 (VRE)	54.3	27.1	≤6.8	>5000	>5000	>5000	>50000	3130	781
<i>Enterococcus faecalis</i> ATCC 51575 (VRE) [†]	54.3	13.6	13.6	>5000	>5000	>5000	50000	50000	391
<i>Enterococcus faecalis</i> ATCC 700802 (VRE)	54.3	27.1	13.6	>5000	>5000	>5000	50000	50000	391
<i>Enterococcus faecalis</i> NBRC 100480	27.1	13.6	13.6	>5000	>5000	5000	50000	781	391
<i>Enterococcus faecium</i> ATCC 35667	109	≤6.8	≤6.8	5000	5000	5000	>50000	>50000	1560
<i>Enterococcus faecium</i> ATCC 49224	109	13.6	13.6	>1250	>1250	>1250	391	195	≤48.8
<i>Enterococcus faecium</i> ATCC 49225	27.1	13.6	27.1	>1250	>1250	>1250	781	195	≤48.8
<i>Enterococcus faecium</i> ATCC 51558	13.6	13.6	13.6	5000	1250	1250	195	97.7	≤48.8
<i>Enterococcus faecium</i> ATCC 51559 (VRE)	13.6	13.6	13.6	5000	5000	2500	781	195	97.7
<i>Enterococcus faecium</i> ATCC 700221 (VRE)	27.1	27.1	13.6	>5000	>5000	5000	781	391	97.7
<i>Enterococcus faecium</i> NBRC 100485	217	27.1	≤6.8	>5000	>5000	>5000	50000	391	391
<i>Enterococcus faecium</i> NBRC 100602	54.3	13.6	13.6	>2500	>2500	>2500	50000	391	≤48.8
<i>Enterococcus flavescens</i> ATCC 49997	13.6	13.6	13.6	>2500	>2500	>2500	781	781	391

Bacterial Strain	Minimal bactericidal concentration, µg/ml								
	Olanexidine gluconate			Chlorhexidine digluconate			Povidone iodine		
	30 s	60 s	180 s	30 s	60 s	180 s	30 s	60 s	180 s
<i>Enterococcus flavescens</i> ATCC 49998	54.3	13.6	13.6	>2500	>2500	>2500	50000	1560	781
<i>Enterococcus gallinarum</i> ATCC 49609	217	54.3	13.6	>5000	>5000	>5000	>50000	50000	781
<i>Enterococcus gallinarum</i> NBRC 100675	109	54.3	27.1	>5000	5000	5000	50000	781	391
<i>Enterococcus gilvus</i> NBRC 100696	434	109	54.3	>1250	>1250	>1250	781	781	391
<i>Enterococcus pallens</i> NBRC 100697	434	217	54.3	>625	>625	>625	781	781	781
<i>Enterococcus raffinosus</i> NBRC 100492	109	54.3	13.6	>1250	>1250	>1250	1560	781	781
<i>Brevibacterium epidermidis</i> NBRC 14811	13.6	≤6.8	≤6.8	1250	313	19.5	781	391	97.7
<i>Corynebacterium diphtheriae</i> ATCC 11913	109	54.3	13.6	>313	>313	>313	781	391	391
<i>Corynebacterium jeikeium</i> ATCC 43734	109	27.1	27.1	>625	>625	625	195	195	97.7
<i>Corynebacterium minutissimum</i> NBRC 15361	54.3	54.3	13.6	>625	625	625	97.7	≤48.8	97.7
<i>Corynebacterium xerosis</i> NBRC 16721	109	109	≤6.8	>156	156	78.1	391	195	97.7
<i>Listeria monocytogenes</i> ATCC 19115	869	54.3	≤6.8	>2500	>2500	>2500	781	391	195
<i>Propionibacterium acnes</i> ATCC 11827	1740	1740	109	>313	>313	156	781	781	391
<i>Propionibacterium avidum</i> ATCC 49753	27.1	13.6	13.6	625	313	78.1	781	781	781
<i>Propionibacterium granulosum</i> ATCC 25746	≤6.8	≤6.8	≤6.8	19.5	19.5	9.8	781	781	781
<i>Achromobacter xylosoxidans</i> NBRC 15126	434	109	27.1	>5000	>5000	2500	391	391	195
<i>Acinetobacter baumannii</i> ATCC 19606	13.6	13.6	≤6.8	313	78.1	19.5	195	97.7	97.7

Bacterial Strain	Minimal bactericidal concentration, µg/ml								
	Olanexidine gluconate			Chlorhexidine digluconate			Povidone iodine		
	30 s	60 s	180 s	30 s	60 s	180 s	30 s	60 s	180 s
<i>Acinetobacter calcoaceticus</i> NBRC 12552	54.3	27.1	13.6	1250	625	19.5	195	195	97.7
<i>Acinetobacter</i> species ATCC 49137	27.1	≤6.8	≤6.8	156	19.5	19.5	391	195	≤48.8
<i>Alcaligenes faecalis</i> ATCC 8750	869	434	54.3	5000	5000	1250	3130	781	391
<i>Bacteroides fragilis</i> ATCC 25285	54.3	27.1	13.6	313	156	156	781	781	781
<i>Burkholderia cepacia</i> ATCC 25416	>6950	>6950	434	>5000	>5000	625	391	391	195
<i>Burkholderia cepacia</i> ATCC 35254	>6950	1740	434	>5000	>5000	625	391	391	195
<i>Citrobacter freundii</i> ATCC 8090	109	54.3	13.6	1250	156	39.1	781	391	391
<i>Enterobacter aerogenes</i> ATCC 13048	54.3	13.6	≤6.8	625	78.1	19.5	391	195	195
<i>Enterobacter cloacae</i> ATCC 13047	109	109	27.1	1250	156	78.1	781	781	391
<i>Escherichia coli</i> ATCC 11229	217	54.3	27.1	625	313	39.1	781	391	195
<i>Escherichia coli</i> ATCC 25922	54.3	27.1	13.6	39.1	19.5	19.5	391	195	195
<i>Klebsiella pneumoniae</i> ATCC 13883	54.3	27.1	13.6	2500	313	156	781	391	391
<i>Legionella pneumophila</i> ATCC 33152	13.6	13.6	13.6	>78.1	>78.1	>78.1	195	195	195
<i>Moraxella catarrhalis</i> ATCC 49143	13.6	≤6.8	≤6.8	313	156	19.5	≤48.8	≤48.8	≤48.8
<i>Morganella morganii</i> ATCC 25830	217	27.1	13.6	39.1	19.5	9.8	195	97.7	≤48.8
<i>Pantoea agglomerans</i> NBRC 102470	217	54.3	27.1	313	156	39.1	391	391	195
<i>Proteus hauseri</i> ATCC 13315	54.3	13.6	≤6.8	156	39.1	39.1	391	195	97.7

Bacterial Strain	Minimal bactericidal concentration, µg/ml								
	Olanexidine gluconate			Chlorhexidine digluconate			Povidone iodine		
	30 s	60 s	180 s	30 s	60 s	180 s	30 s	60 s	180 s
<i>Proteus mirabilis</i> ATCC 29245	869	217	54.3	>5000	156	39.1	391	195	97.7
<i>Providencia rettgeri</i> ATCC 9250	54.3	27.1	13.6	5000	2500	156	391	391	391
<i>Providencia stuartii</i> ATCC 33672	869	109	54.3	>5000	>5000	2500	781	781	391
<i>Pseudomonas aeruginosa</i> ATCC 15442	54.3	27.1	13.6	>5000	1250	78.1	781	391	195
<i>Pseudomonas aeruginosa</i> ATCC 27853	54.3	13.6	13.6	39.1	19.5	19.5	391	391	391
<i>Pseudomonas fluorescens</i> ATCC 49838	≤6.8	≤6.8	≤6.8	78.1	19.5	≤4.9	391	391	195
<i>Pseudomonas putida</i> ATCC 49128	27.1	27.1	13.6	156	19.5	9.8	781	781	391
<i>Pseudomonas stutzeri</i> NBRC 14165	13.6	13.6	13.6	156	78.1	9.8	195	195	97.7
<i>Salmonella enteritidis</i> ATCC 13076	54.3	27.1	≤6.8	78.1	39.1	19.5	391	195	195
<i>Salmonella paratyphi</i> ATCC 9150	27.1	13.6	13.6	156	156	39.1	391	391	195
<i>Salmonella typhimurium</i> ATCC 14028	54.3	54.3	≤6.8	5000	5000	156	781	391	391
<i>Serratia liquefaciens</i> NBRC 12979	54.3	27.1	13.6	1250	313	39.1	781	781	781
<i>Serratia marcescens</i> ATCC 14756	54.3	54.3	13.6	5000	78.1	39.1	391	391	195
<i>Shigella flexneri</i> ATCC 12022	217	109	27.1	>625	156	19.5	781	391	97.7
<i>Shigella sonnei</i> ATCC 25931	54.3	27.1	≤6.8	1250	78.1	19.5	391	195	195
<i>Stenotrophomonas maltophilia</i> ATCC 13637	109	54.3	13.6	5000	625	19.5	391	195	97.7
<i>Yersinia enterocolitica</i> ATCC 27729	217	54.3	13.6	625	39.1	19.5	391	195	97.7

*The ranges in Table 1 are based on these data.

†These data were collected in the current study but are included in Reference 7, which was published first.

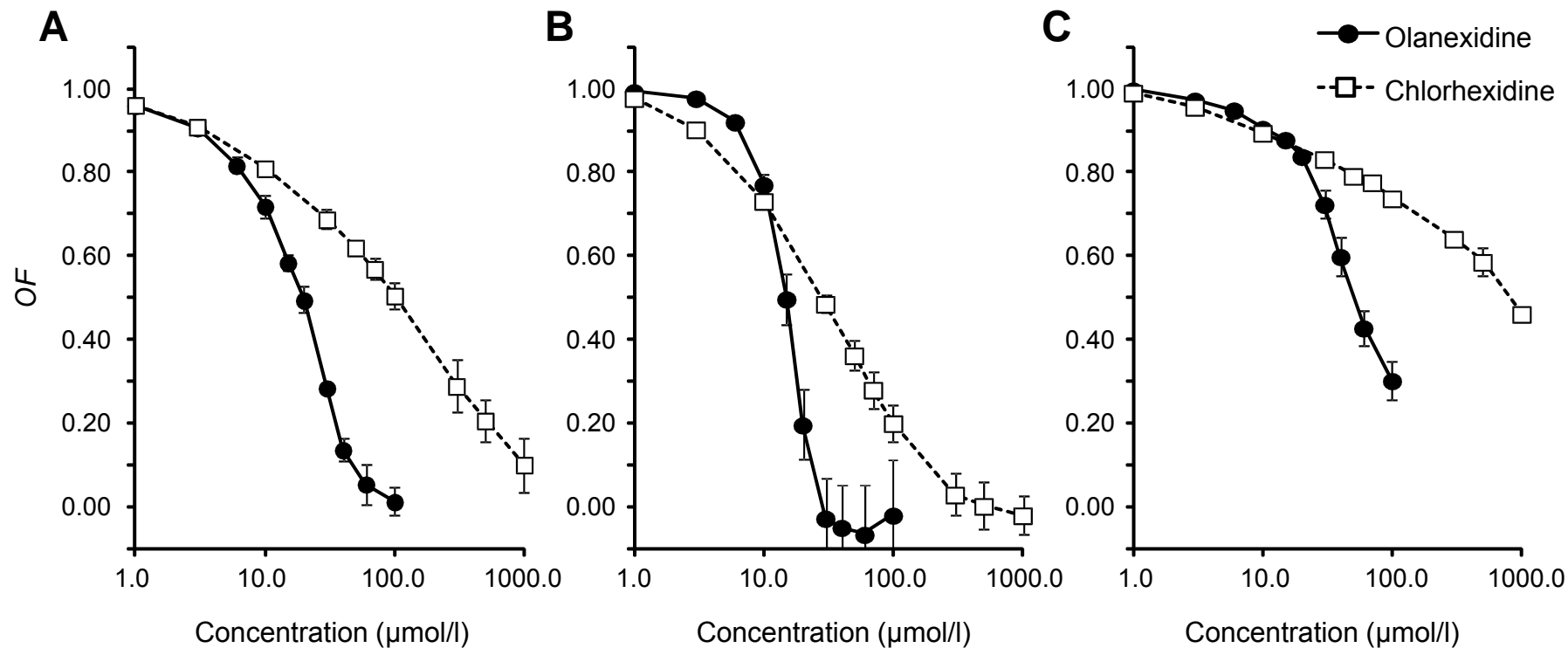


FIG S1 Displacements of (A) LPS-, (B) Lipid A-, and (C) LTA-bound BODIPY TR cadaverine (BC) by olanexidine (●) and chlorhexidine (□). The BC displacement, shown by dequenching of the fluorescence intensity, is quantified by its occupancy factor (OF). $OF = (F_0 - F) / (F_0 - F_{max})$, where F is fluorescence intensity of the solutions containing of the test antiseptic and BC-LPS solution, BC-Lipid A solution, or BC-LTA solution; F_0 is fluorescence intensity of BC solution; F_{max} is fluorescence intensity of LPS-bound BC solution, Lipid A-bound BC solution, or LTA-bound BC solution. Each point and vertical bar represents the mean \pm SD ($n = 3$).