

Table 1. Biofilm barriers to selected antimicrobial classes

Class of Antibiotics (Eg.)	Mechanism of Action	Biofilm barriers
β -Lactams (penicillin, ampicillin, cefazolin, ceftazidime, ceftriaxone, meropenem)	Inhibition of cell wall (peptidoglycan) synthesis	<ul style="list-style-type: none">• Slow growing bacteria in biofilms• Decrease in PBPs in mature biofilms
Aminoglycosides (gentamicin, tobramycin, amikacin)	Inhibition of protein synthesis through binding 30s ribosomal subunit	<ul style="list-style-type: none">• Increased expression of efflux pumps• Biofilm matrix prevents uptake into bacteria
Fluoroquinolones (ciprofloxacin, levofloxacin, moxifloxacin)	Blocks DNA replication by inhibiting DNA gyrase	<ul style="list-style-type: none">• Increased expression of efflux pumps
Macrolides (azithromycin, erythromycin, clarithromycin)	Inhibits protein elongation by binding 50s ribosomal subunit	<ul style="list-style-type: none">• Increase in biofilm adhesion and biomass
Tetracyclines (doxycycline, minocycline)	Inhibits protein synthesis via 30s ribosomal binding	<ul style="list-style-type: none">• Increased expression of efflux pumps
Glycopeptides	Inhibit peptidoglycan synthesis	<ul style="list-style-type: none">• Decreased rate of penetration

PBPs: penicillin binding proteins