# Antibiotic classes

Here is a list of antibiotic classes and their mechanisms of action, presented in a concise table:

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| **Antibiotic Class** | **Mechanism of Action** |
| **β-Lactams** | Inhibit **bacterial cell wall synthesis** by binding to penicillin-binding proteins (PBPs), disrupting the formation of peptidoglycan cross-links.  Bactericidal |
| **Glycopeptides** | Bind terminal D-Ala-D-Ala on peptidoglycan precursors thereby blocking enzyme glycosyltransferase |
| **Aminoglycosides** | Interfere with **bacterial protein translation** by uniquely affecting prokaryotic ribosomes  Bactericidal |
| **Macrolides & Lincosamides** | Inhibit **bacterial protein synthesis** by binding to the **50S ribosomal subunit**.  Generally considered bacteriostatic |
| **Tetracyclines & Glycylcyclines** | Inhibit **bacterial protein synthesis** by reversibly binding to the **30S ribosomal subunit**, which prevents aminoacyl-tRNA from attaching to the ribosomal 'A' site.  Bacteriostatic. |
| **Sulfonamides** | Inhibit **bacterial folate synthesis** by competitively preventing the incorporation of para-aminobenzoic acid (PABA) into tetrahydropteroic acid.  Bacteriostatic. |
| **Trimethoprim** | Inhibits **bacterial folate synthesis**. It is bacteriostatic. |
| **Fluoroquinolones** | Inhibit **bacterial DNA synthesis** by targeting **DNA gyrase** (in Gram-negatives) and **topoisomerase IV** (in Gram-positives).  Bactericidal. |
| **Nitroimidazoles** | Act as prodrugs that are activated within the bacterial cell through a reduction step to form highly reactive products that interact with **intracellular targets**,  Bactericidal and parasiticidal effects. |
| **Nitrofurans** | Have a multi-site mechanism of action, including inhibiting **ribosomal translation**, causing **bacterial DNA damage**, and interfering with the Krebs cycle.  Bactericidal |
| **Rifamycins** | Inhibit **bacterial RNA synthesis** by binding with high affinity to **DNA-dependent RNA polymerase (RNAP)**. |
| **Polymyxins** | Disrupt **bacterial outer cell membranes** by interacting electrostatically with phospholipids and displacing divalent cations, thereby increasing cellular permeability.  Bactericidal. |
| **Fusidic Acid** | Inhibits **bacterial protein synthesis** by blocking the translocation of peptidyl transfer RNA and impeding the action of elongation factor G on the ribosome.  Bacteriostatic, with bactericidal properties at higher concentrations. |
| **Daptomycin** | Targets and disrupts the **cell membrane of Gram-positive organisms** in a calcium-dependent manner, leading to distortions in membrane architecture and displacement of essential inner membrane proteins.  Bactericidal. |
| **Oxazolidinones** | Inhibit b**acterial protein synthesis** by binding to the **23S RNA component of the 50S ribosomal subunit**.  Bacteriostatic |
| **Chloramphenicol** | Inhibits **bacterial protein synthesis** by binding to the **50S ribosomal subunit**. |
| **Fosfomycin** | Inhibits **bacterial cell wall synthesis** by targeting UDP-N-acetylglucosamine enolpyruvyl transferase (MurA), blocks peptidoglycan synthesis.  Bacteriocidal |