Chemotherapy

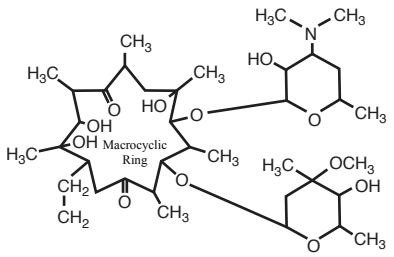
Select Illustrations of

Chemical Structures

&

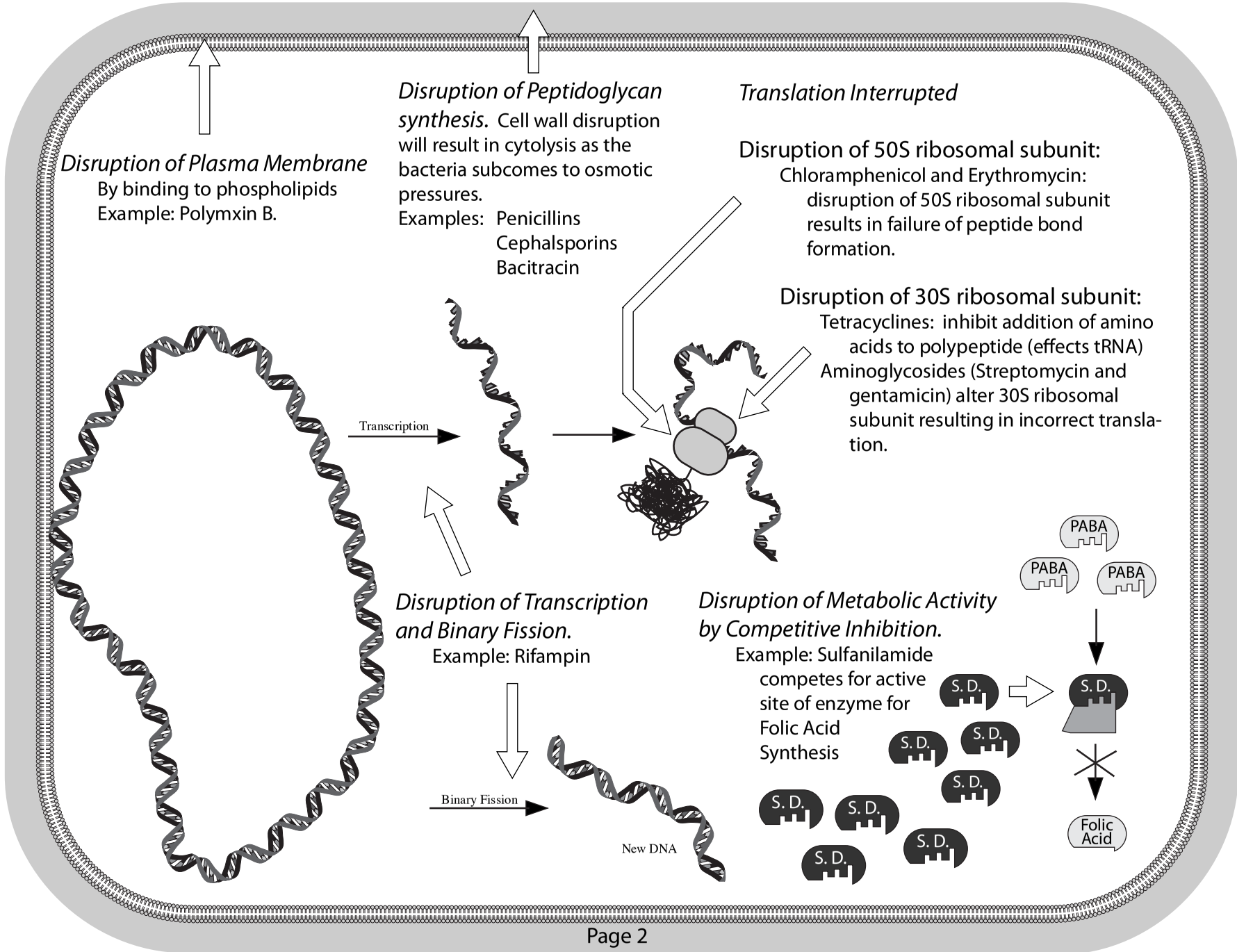
Modes of Activity

to accompany lecture



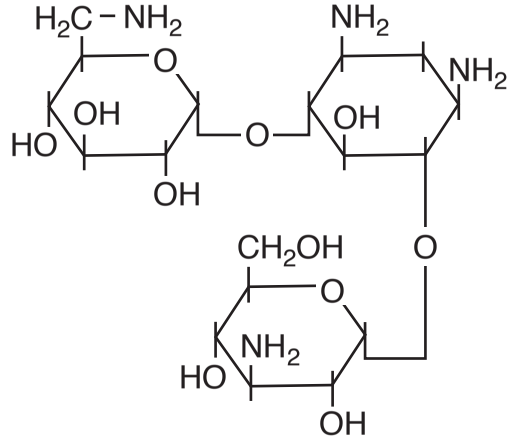
By Noel Ways

Chemotheraputic Modes of Action Against Bacteria

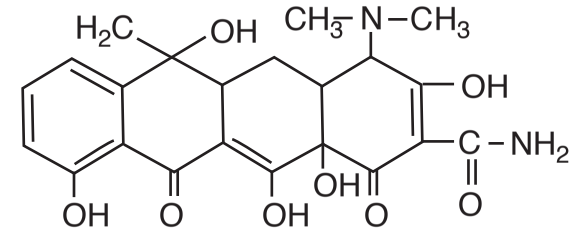


Chemical Structures of Select Drugs

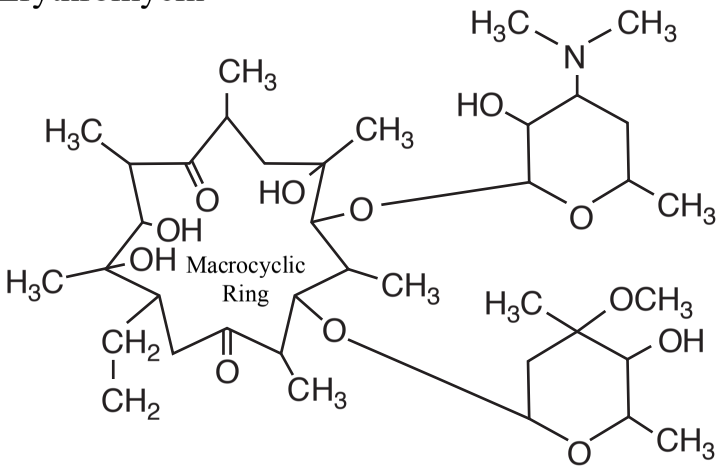
Aminoglycosides



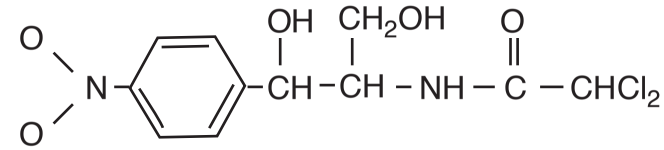
Tetracyclines



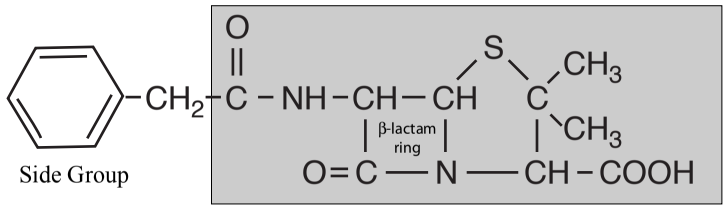
Erythromycin



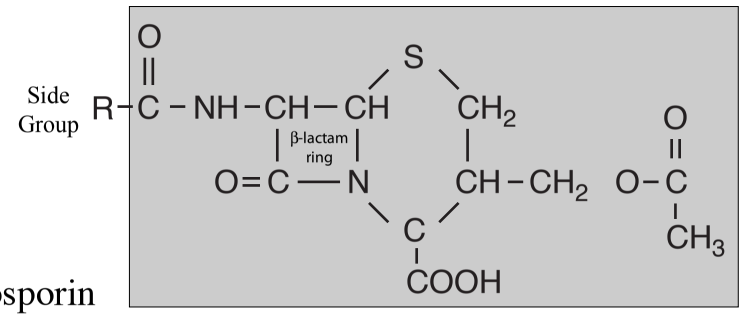
Chloramphenicol

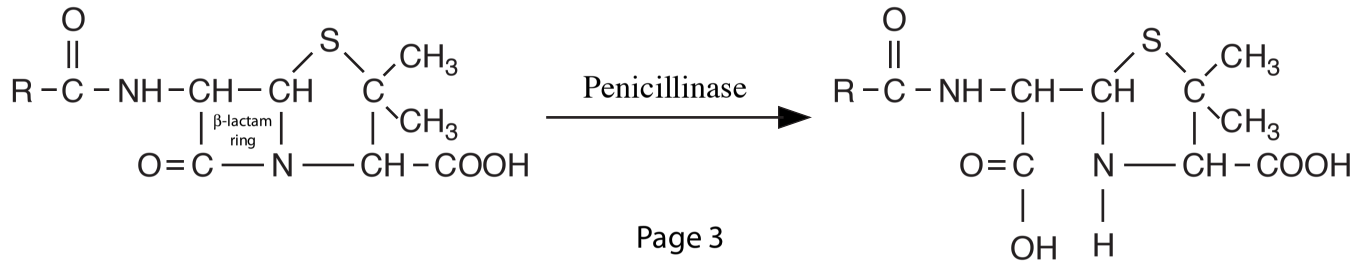


Penicillin



Cephalosporin



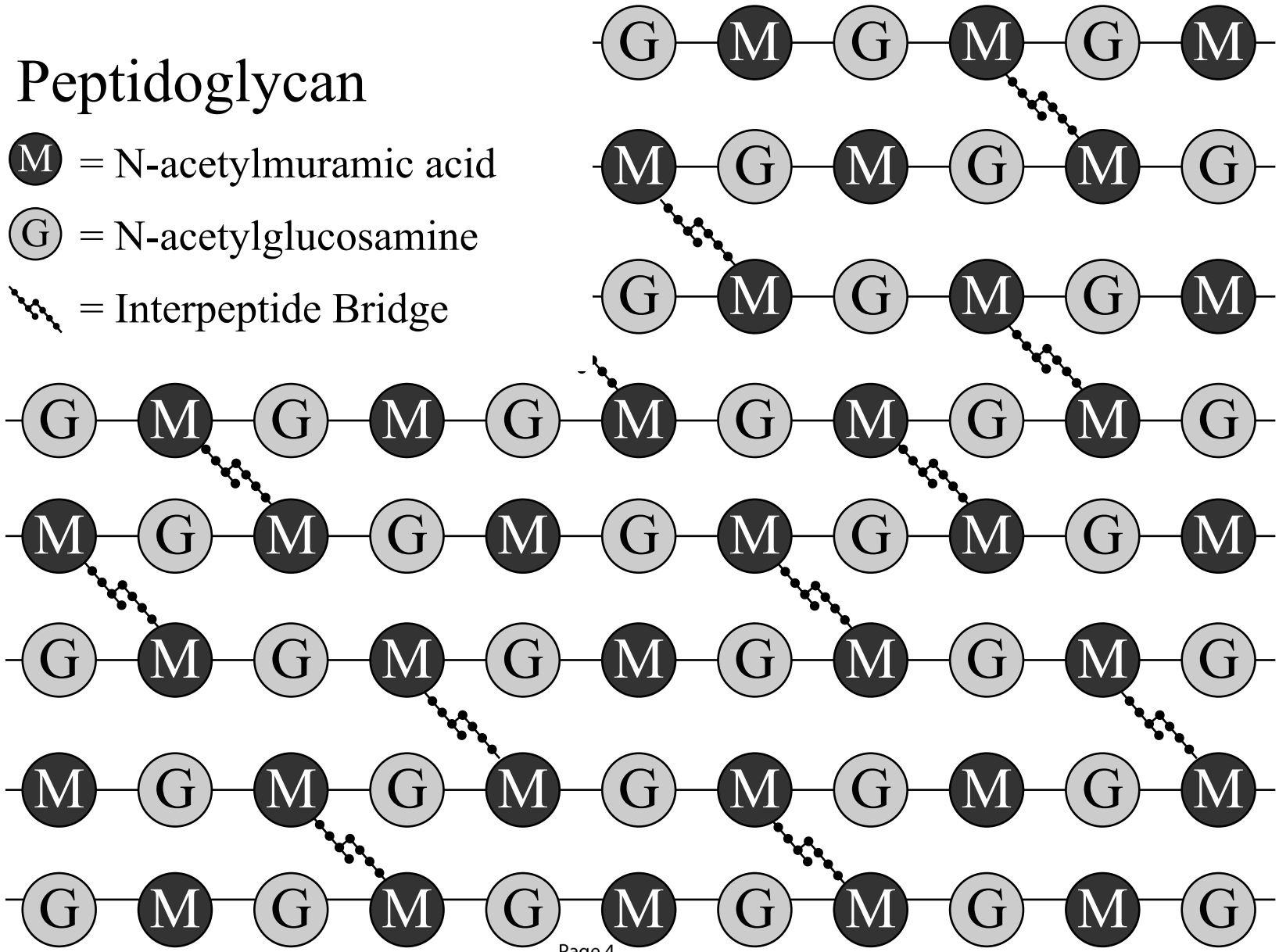


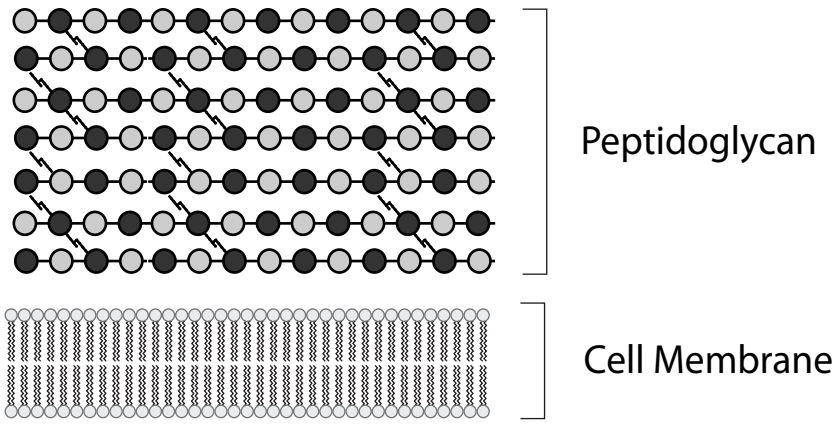
Peptidoglycan

M = N-acetylmuramic acid

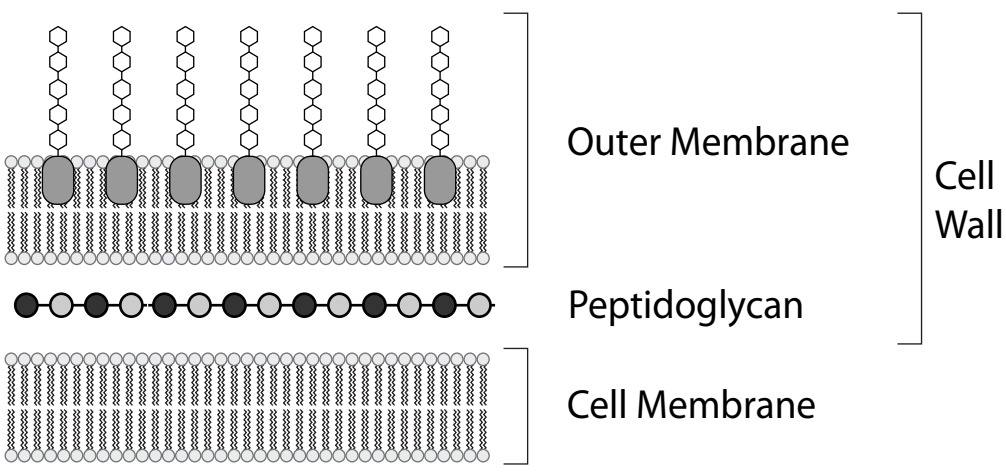
G = N-acetylglucosamine

= Interpeptide Bridge



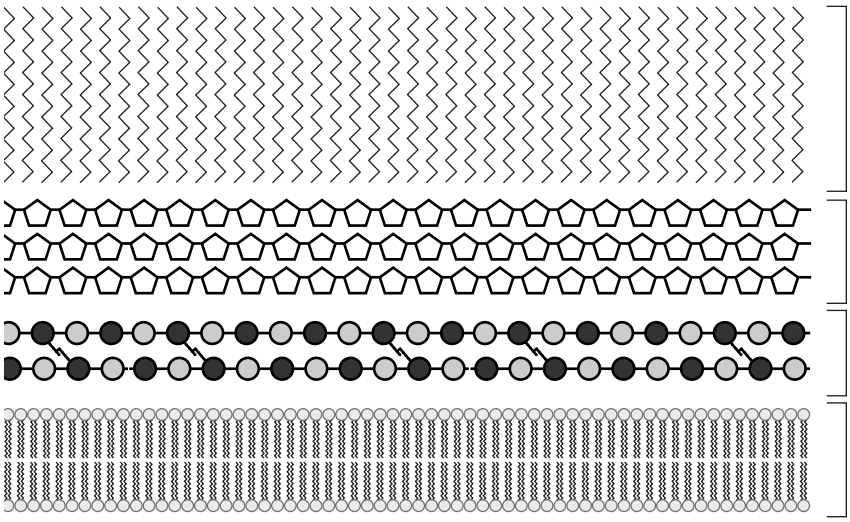


Gram Positive



Gram Negative

Schematic of Mycobacterial Cell Wall



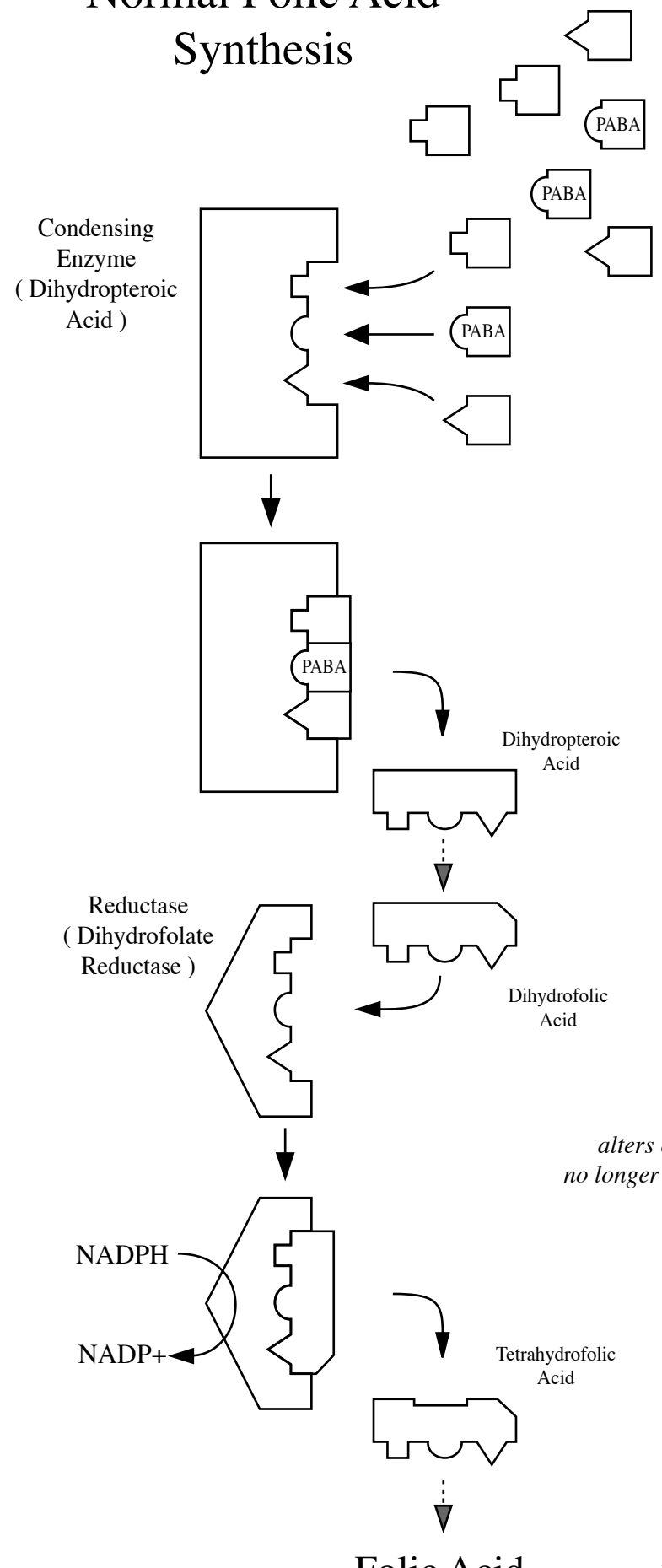
Mycobacteria characteristically have an outer waxy layer containing mycolic acid (a fatty acid) as well as other related stubstances.

Isoniazid inhibits the synthesis of mycolic acid

Ethambutol inhibits the incorporation of mycolic acid into the cell wall.

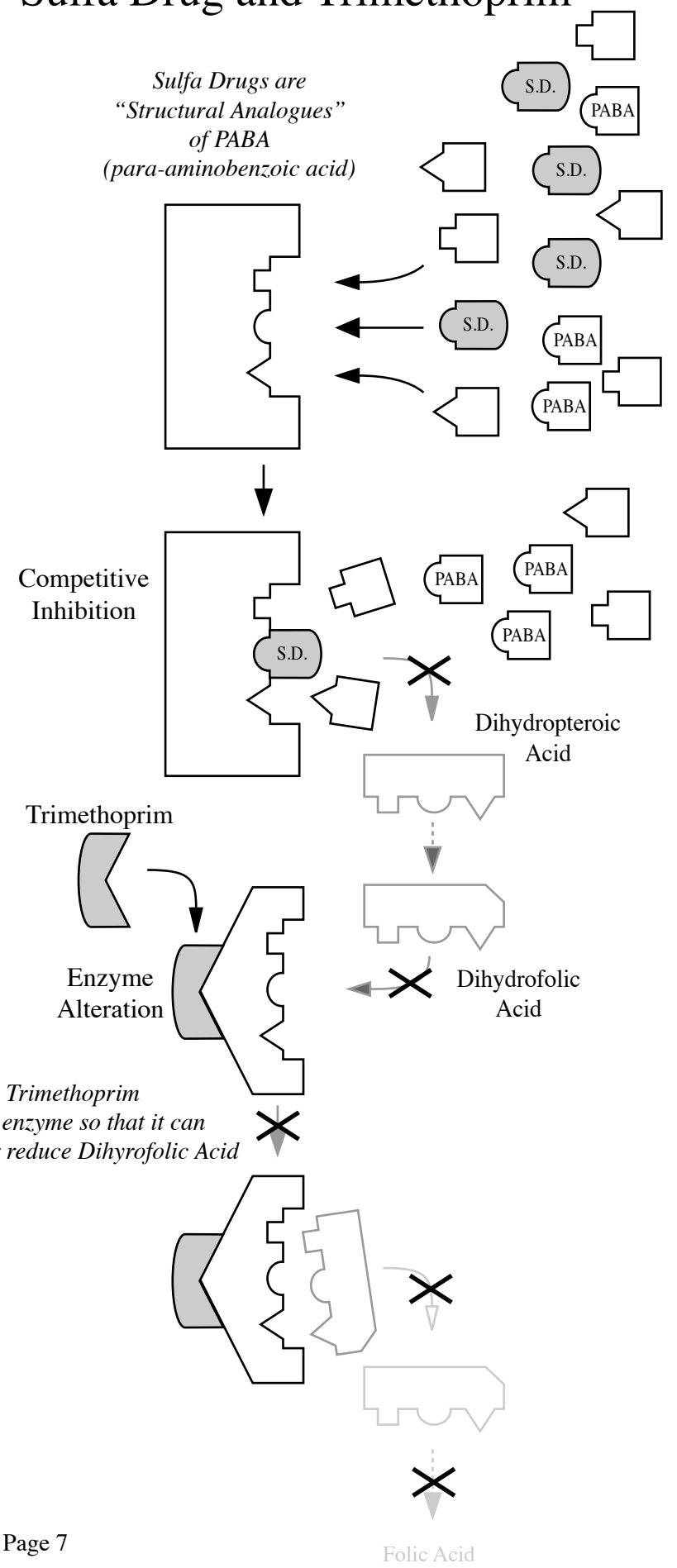
Both drugs are effective in fighting *Mycobacterium tuberculosis* and *Mycobacterium leprae*.

Normal Folic Acid Synthesis

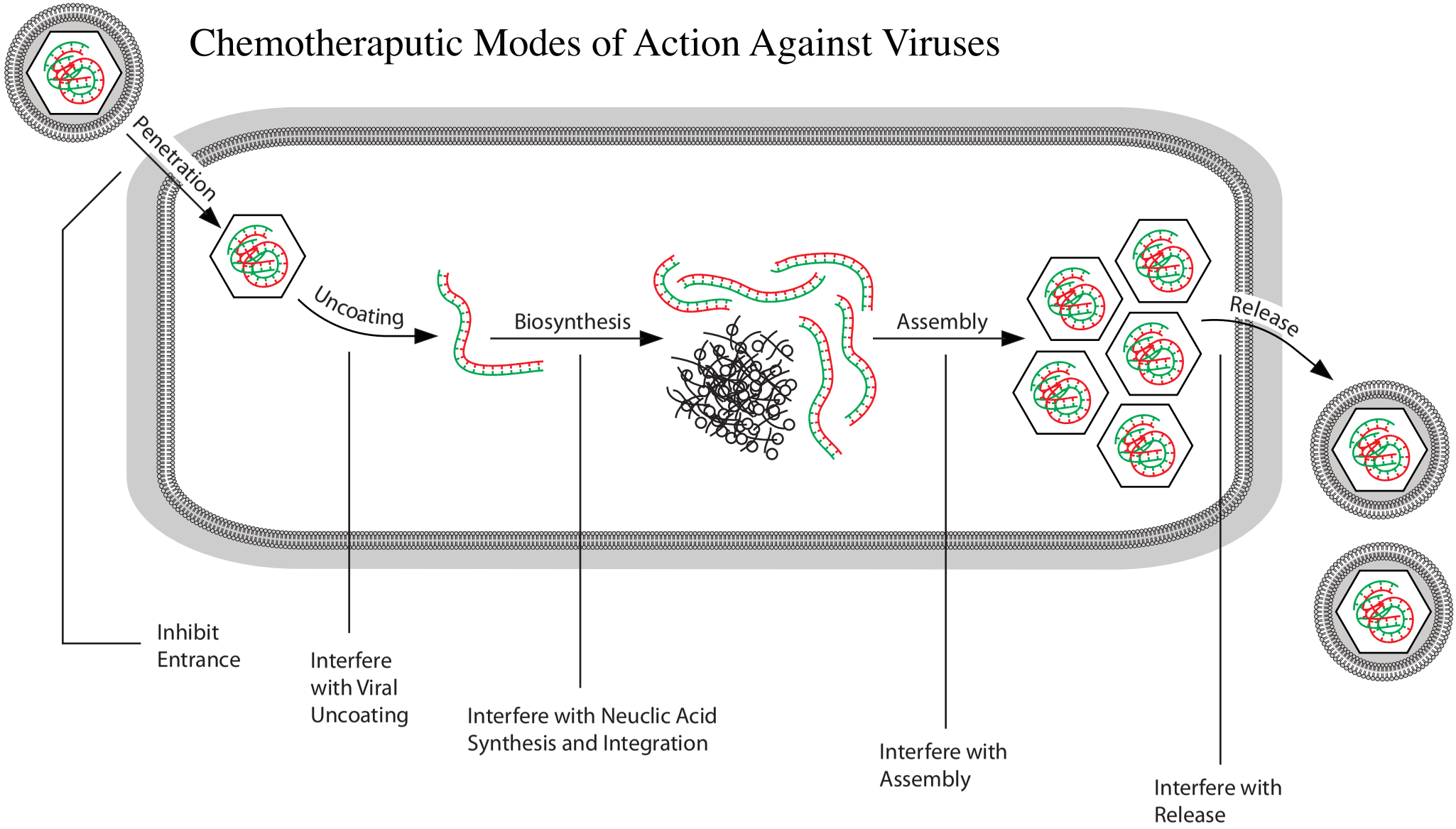


Synergistic Effect of a Sulfa Drug and Trimethoprim

Sulfa Drugs are "Structural Analogues" of PABA (para-aminobenzoic acid)



Chemotheraputic Modes of Action Against Viruses



Adapted from Nester's Microbiology, A Human Perspective 8th edition, c 2016, McGraw Hill Educaiton

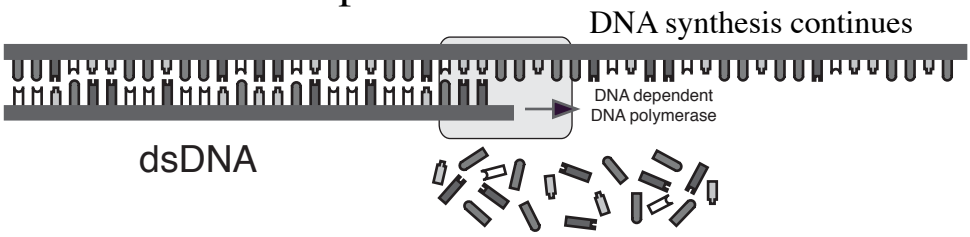
Interfere with Nucliec Acid Synthesis

Nucleoside Analogs

deoxyguanosine

Acyclovir

Normal DNA Replication



DNA Replication with Nucleoside Analog