

**Classification of Antibiotics:**

1. Inhibit growth - "stat"  
Kill bacterium - "cide"
2. Broad and Narrow spectrum
3. Production Types:  
Natural  
Synthetic  
Semi-synthetic

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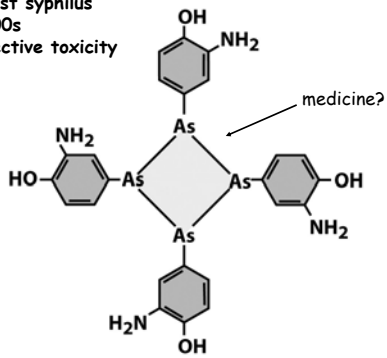
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Salvarsan: The first magic bullet  
Works against syphilis  
Ehrlich, 1900s  
Idea of selective toxicity




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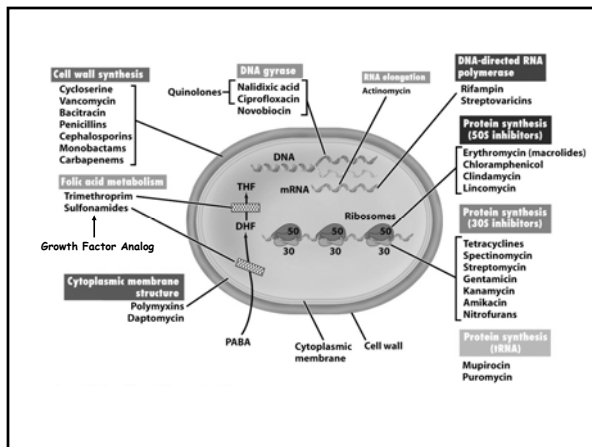
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**Antibiotics Affecting Replication, Transcription, & Translation**

**DNA replication:**

Nalidixic Acid & Novobiocin - Inhibits DNA gyrase

**Transcription:**

Rifampin - Beta subunit of RNA polymerase

Actinomycin - DNA binding, blocks elongation

**Translation:**

Streptomycin - Blocks initiation on SSU of ribosome

Chloramphenicol - Blocks elongation on LSU via peptide bond

Tetracycline - Blocks elongation SSU

Cycloheximide - Eucarya ribosome specific

Diphtheria Toxin - EF blocker; both Archaea and Eucarya

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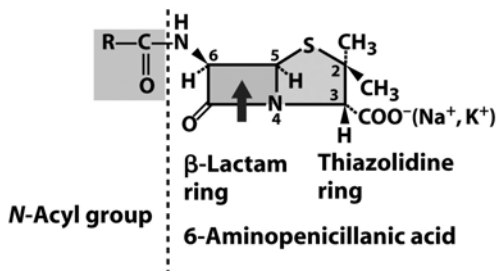
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**How to build a better mouse trap: Penicillin  
A  $\beta$ -lactam antibiotic**



**Inhibits transpeptidation of peptidoglycan chains  
Forms the old 1-2-punch with autolysins**

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**Mechanisms of Antibiotic Resistance**

1. Lacks structure antibiotic inhibits:  
Mycoplasmas lack a typical cell wall.
2. Impermeable to the antibiotic:  
Gram - bacteria impermeable to penicillin G.
3. Alteration of antibiotic:  
 $\beta$ -lactamase degrades antibiotic e.g., springs open the mouse trap.
4. Modifies the target of the antibiotic.
5. Genetically modifies the pathway that the antibiotic affects.
6. Efflux of the antibiotic:  
Tetracycline gets pumped back out of the cell.

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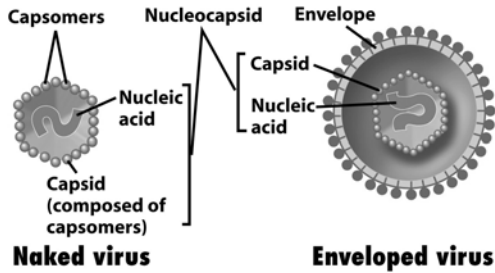
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Comparison of naked and enveloped virus, two basic types of virus particles.




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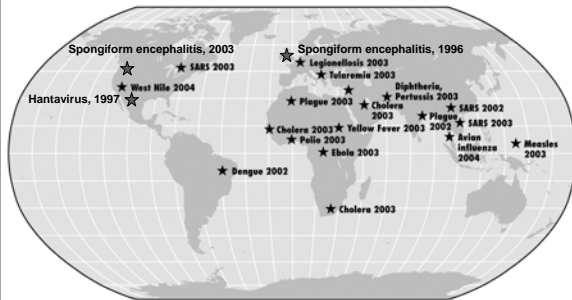
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Recent outbreaks of emerging and reemerging infectious diseases.




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**Table 30.4** The recommended immunization schedule for infants and young children in the United States

Age	Vaccine Employed
Birth	Hepatitis B
2 months	Diphtheria; pertussis; tetanus (DPT) Hemophilus B (Hib) Poliomyelitis (OPV)
4 months	DPT; OPV; Hib
6 months	Hepatitis B DPT; OPV; Hib
12-15 months	DPT; Hib; chicken pox, measles, mumps, rubella (MMR)
4-6 years	OPV; DTP; MMR

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