

# Antibiotics: Use and Abuse

**Secondary Metabolites** produced near the end of a bacterium or fungus life cycle:

1. Formed @ end of stationary phase of growth
2. Not essential for growth or viability
3. Formation depends upon the media, possible over production

## Classification of antibiotics:

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

# 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

Note: Genetic basis of antibiotic resistance can be either **plasmid** and/or **chromosomal**