TOPIC: HOW ANTIMICROBIAL DRUGS WORK

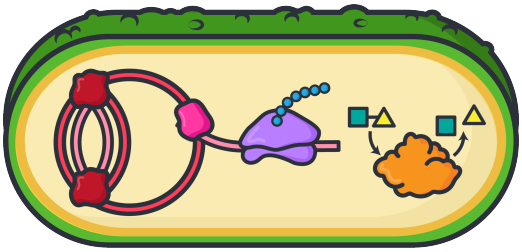
Selective Toxicity

- *Recall*: selective toxicity: drugs must kill _____ but not be toxic to humans.
  - More difficult for _____ and _____; share more molecular machinery with humans.
  - Easier with prokaryotes (_____); more differences from human cells.
- _____ basic targets of antibacterials:

1) Cell _____:
- Bacteria use cell walls of peptidoglycan.

2) Cell Membrane:
- Bacteria use _____ lipids in membrane.

3) Nucleic Acid Synthesis:
- Different _____ for replication & transcription.



4) Ribosome and Translation:
- Different _____ structure (70s vs 80s).

5) Metabolic Pathways:
- Bacteria must produce _____ acid.

Usually Bactericidal: _____ bacteria directly.

Usually *Bacteriostatic*: stop _____ (allowing immune system to act).

EXAMPLE

Given below are components of different targets of common antibacterial drugs. For each component, determine if a drug targeting that component is more likely to be bactericidal or bacteriostatic. For bactericidal, write "BC" and for bacteriostatic, write "BS".

1	Folic acid synthesis	
2	Peptidoglycan	
3	70S ribosome	
4	Lipids and sterols	
5	Topoisomerase	

If a drug is bacteriostatic, how is the infection ever cleared from the body?

_____

_____

_____

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PRACTICE

When identifying ways a drug may be selectively toxic, why is bacterial protein synthesis a good potential target?

a) Bacteria and eukaryotes use different tRNAs.

b) There are many differences between bacterial 70s ribosomes and eukaryotic 80s ribosomes.

c) The genetic code between bacteria and eukaryotes is different, allowing drugs to target bacterial-specific codons.

d) Bacterial ribosomes often bind to RNA and initiate translation before transcription is complete.