

TOPIC: HOW ANTIMICROBIAL DRUGS WORK

Selective Toxicity

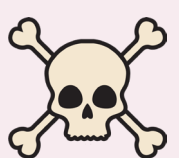
- ◆ Recall: selective toxicity: drugs must kill _____ but not be toxic to humans.
 - More difficult for _____ and _____; share more molecular machinery with humans.
 - Easier with prokaryotes (_____); more differences from human cells.
- ◆ _____ basic targets of antibacterials:

1) Cell _____: 

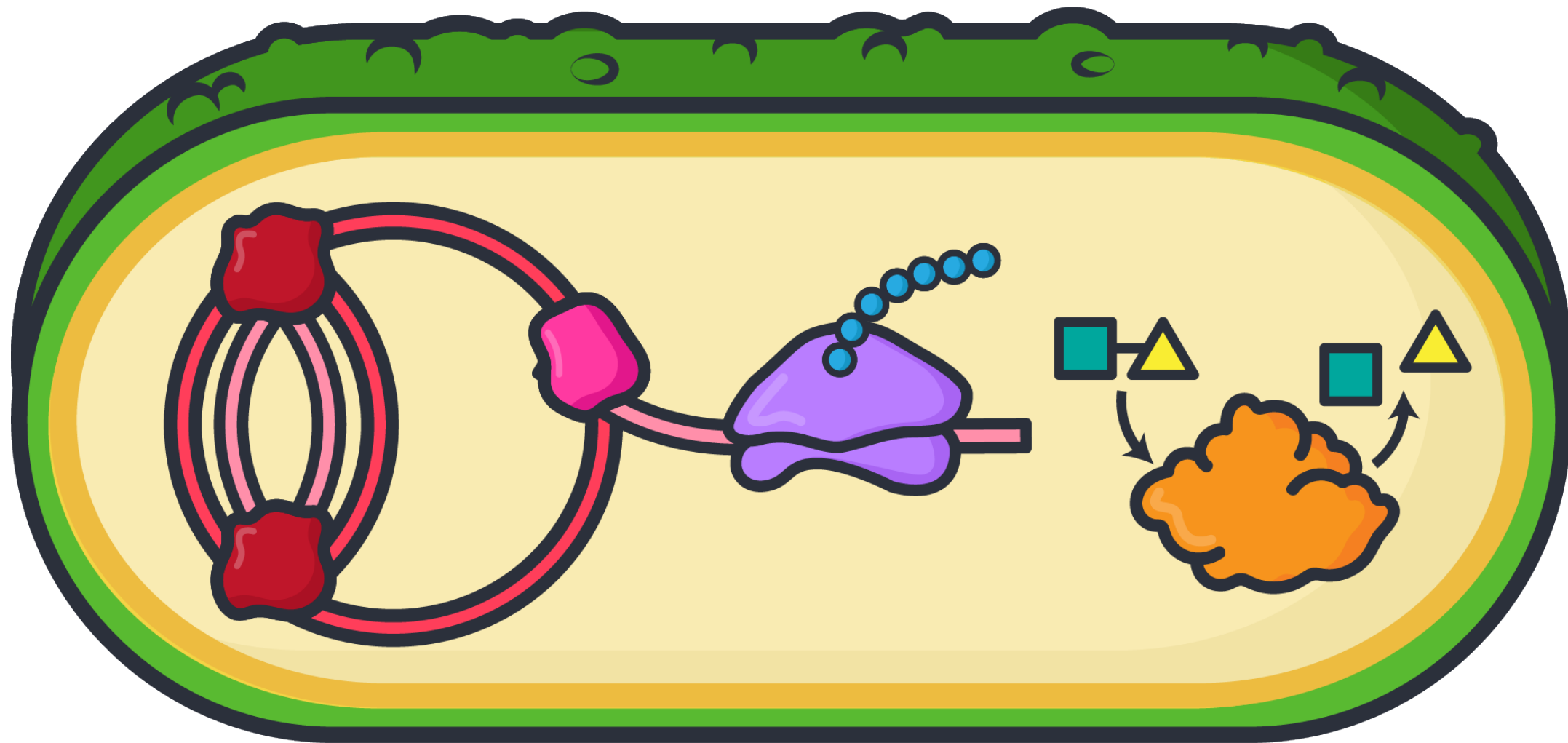
◆ Bacteria use cell walls of peptidoglycan.

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



Usually **Bactericidal**: _____ bacteria directly.

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.