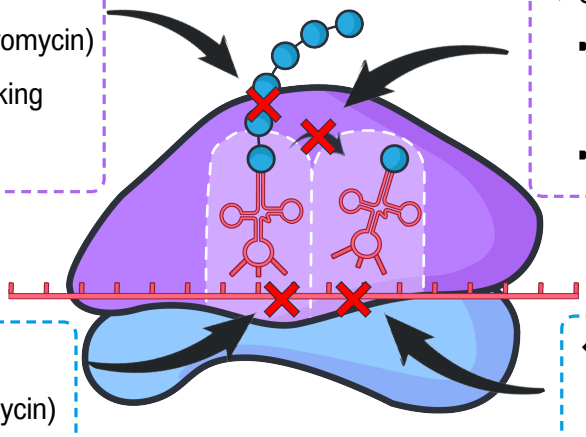
TOPIC:INHIBITORS OF PROTEIN SYNTHESIS

Inhibitors of Protein Synthesis

- *Recall*: bacteria - ____ ribosome, comprised of 30s and 50s subunits.
- Most are _____ spectrum. Gram⊕ ___ Gram⊖ ___

- **Macrolides:**
  (e.g., erythromycin, azythromycin)
  - Bind to 50s subunit blocking exit of _____.

- Chloramphenicol:
  - Bind to 50s subunit blocking formation of _____ bonds.
  - Inexpensive, but serious side effects.



- **Aminoglycosides:**
  (e.g., streptomycin, gentamycin)
  - Bind to 30s subunit leading to ____-translation.
  - Esp. effective: Gram⊖

- **Tetracyclines:**
  (e.g., tetracycline, doxycycline)
  - Bind to 30s subunit blocking _____ binding.

EXAMPLE

Match each drug with the statements that correctly describe it. Note: statements may match more than one drug, and drugs may match with more than one statement.

1. Macrolides _____
2. Doxycycline _____
3. Chloramphenicol _____
4. Tetracycline _____
5. Aminoglycosides _____

a) Binds to the 30s ribosomal subunit.
b) Binds to the 50s ribosomal subunit.
c) Interferes with peptide bond formation.
d) Interferes with tRNA binding.
e) Leads to mistranslation.
f) Blocks the growing amino acid chain.

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PRACTICE

Which of the following statements are true?

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i. Bacterial ribosomes are a good target for selective toxicity because they differ from human ribosomes.

ii. Most antimicrobials that inhibit protein synthesis are broad-spectrum.

iii. The large majority of drugs that affect the ribosome bind to the 50s subunit, as that is where peptide bond formation occurs.

a) I & II. b) I & III. c) III & III. d) I, II, & III.

PRACTICE

Which of the following drugs most directly affect the binding of tRNA to the mRNA?

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a) Chloramphenicol & doxycycline.

b) Azithromycin & streptomycin.

c) Tetracycline & gentamycin.

d) Erythromycin & chloramphenicol.