TOPIC: INHIBITORS OF NUCLEIC ACID SYNTHESIS

Inhibitors of Nucleic Acid Synthesis

◆ *Recall*: bacteria have different replication & transcription enzymes → target for bacteri_____ antibiotics.

Quinolones: inhibit _____ replication enzymes.

- Inhibit _____ and DNA gyrase.

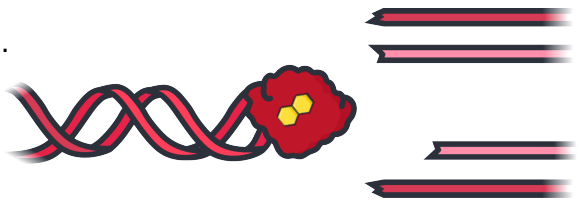
Fluoroquinolones: include a _____ atom (e.g., ciprofloxacin).

- Rare side effect of _____ tendons.

Gram⊕ ___ Gram⊖ ___

The **Queen** is on ____.

____ Topoisomerase



Rifamycins: inhibit _____ synthesis.

- Bind to & inhibit RNA _____.
- **Rifampin:** treats tuberculosis & leprosy.

Gram⊕ ___ Gram⊖ ___

Rifamycin inhibits __NA polymerase.

____ Polymerase

EXAMPLE

For each statement below, determine if it applies to Rifamycin "R", Quinolones "Q", or both "B". If the statement does not apply to either drug, write "NA".

1. Inhibits topoisomerase: _____
2. Binds to the 50s subunit: _____
3. Used to treat mycobacterial infections like tuberculosis: _____
4. Are bactericidal: _____
5. Inhibits mRNA synthesis: _____
6. Blocks the cross linking of NAM subunits: _____

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PRACTICE

How do drugs that inhibit nucleic acid synthesis (e.g., rifamycin & quinolones) differ from inhibitors of protein synthesis (e.g., tetracyclines & aminoglycosides)?

a) Protein synthesis inhibitors target specific enzymes, while nucleic acid synthesis inhibitors target bacterial ribosomes.
b) Protein synthesis inhibitors primarily target Gram-negative bacteria, while nucleic acid inhibitors only target Gram-positive bacteria.
c) Protein synthesis inhibitors typically do not interfere with nucleic acids, while nucleic acid synthesis inhibitors tend to bind to nucleic acids directly.
d) Protein synthesis inhibitors tend to be bacteriostatic, while nucleic acid synthesis inhibitors tend to be bactericidal.

PRACTICE

Which of the following correctly matches the drug with its target?

a) Rifamycin → Topoisomerase.
b) Rifamycin → RNA polymerase.
c) Quinolones → 50s subunit.
d) Quinolones → Primase.