CONCEPT: PROTOTROPHS VS. AUXOTROPHS

●Some cell mutations can alter their _____ *factor* requirements.

1) **Prototrophs (+):** *parent strains* with NO mutation that do _____ require growth factors (*Proto* = *"original form"*).

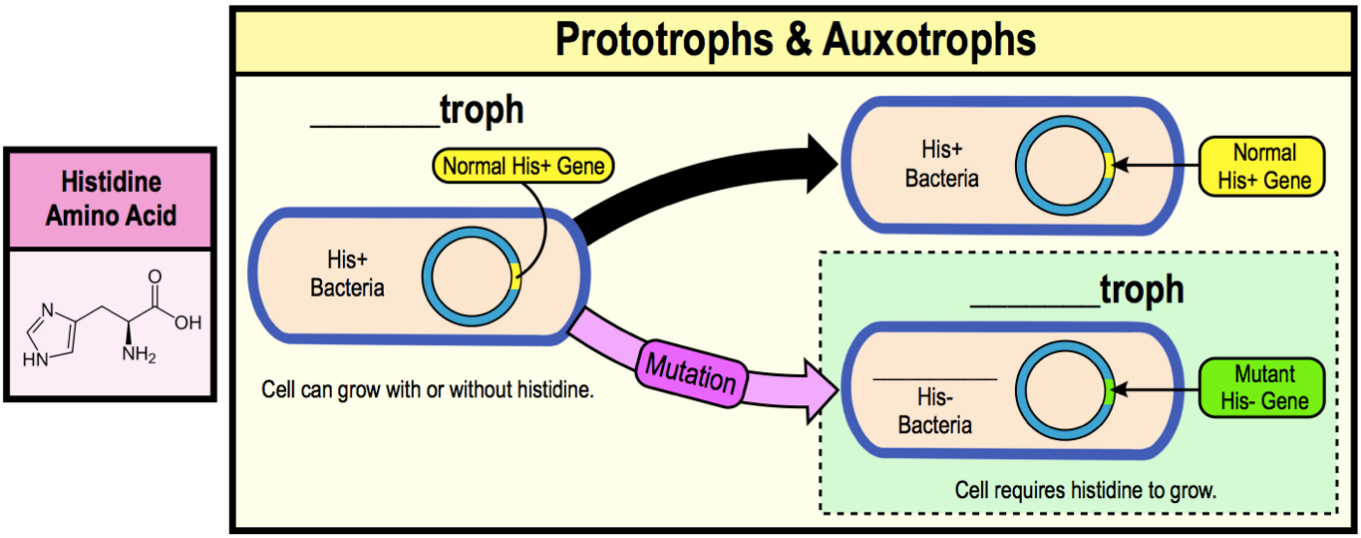
□ Prototrophs can _____ their own growth factors from other molecules.

2) **Auxotrophs (–):** *mutants* that _____ additional growth factors. (*Auxo* = *"increase"*).

□ Auxotrophs have mutations that *prevent* synthesis of their own growth factors, so they must be provided.

●____lus signs (+) represent ____*rototrophs* & minus signs (–) represent *auxotrophs*.

EXAMPLE: Histidine prototrophs (His+ cells) vs. Histidine auxotrophs (His– cells).



EXAMPLE: Can His+ cells survive on an agar plate that does not contain the amino acid histidine?

a) Yes, His+ cells can survive on an agar plate without histidine.

b) No, His+ cells are not capable of surviving on an agar plate without histidine.

PRACTICE: A mutant strain of bacteria requiring additional growth factors that is not seen in the wildtype strain is called:

a) An autotroph.

b) A heterotroph.

c) A prototroph.

d) An auxotroph.

e) A phototroph.

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PRACTICE: Which of the following answers about His+ prototrophs and His- auxotrophs is incorrect?

a) His+ prototrophs are the parent bacterial cells with no mutations.

b) His+ prototrophs require the amino acid histidine to grow.

c) His- auxotrophs are the mutant bacterial cells which require growth factors to grow.

d) His- auxotrophs cannot grow without the amino acid histidine.

e) All of the above answers are correct.