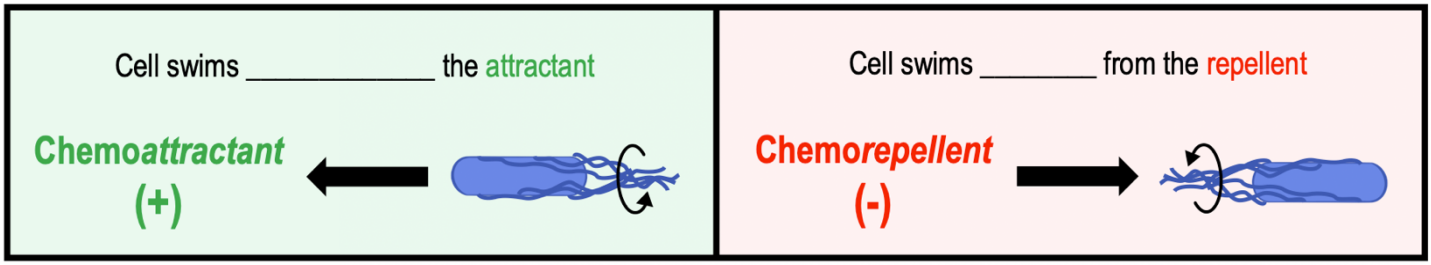
CONCEPT: CHEMOTAXIS

- *Recall:* Energy from a _____ is used to move a cell towards a more favorable environment using its flagella.
- **Chemotaxis:** the movement of a cell _____ *chemoattractants* & _____ from *chemorepellents*.
  - □ **Chemoattractant:** a chemical that _____ motile cells (*positive chemotaxis*).
  - □ **Chemorepellent:** a chemical that _____ motile cells (*negative chemotaxis*).
- _____**taxis:** the cell movement towards (*positive*) or away from (*negative*) light.

EXAMPLE: Chemotaxis of motile cells towards or away from certain chemicals.



- The path that motile cells take towards or away from something is _____ a continuous straight line.

PRACTICE: Structures external to the bacterial cell wall that is used for motility (movement) by chemotaxis:

a) Endospores.
b) Capsules.
c) Flagella.
d) Pili.
e) Ribosomes.

PRACTICE: A bacterial cell moving away from the light would be an example of…

a) Positive phototaxis.
b) Negative phototaxis.
c) Positive chemotaxis.
d) Negative chemotaxis..

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Cell Motility During Chemotaxis

●*Recall*: Motile cells use their flagella in a run-and-tumble mechanism, changing directions during each _____.

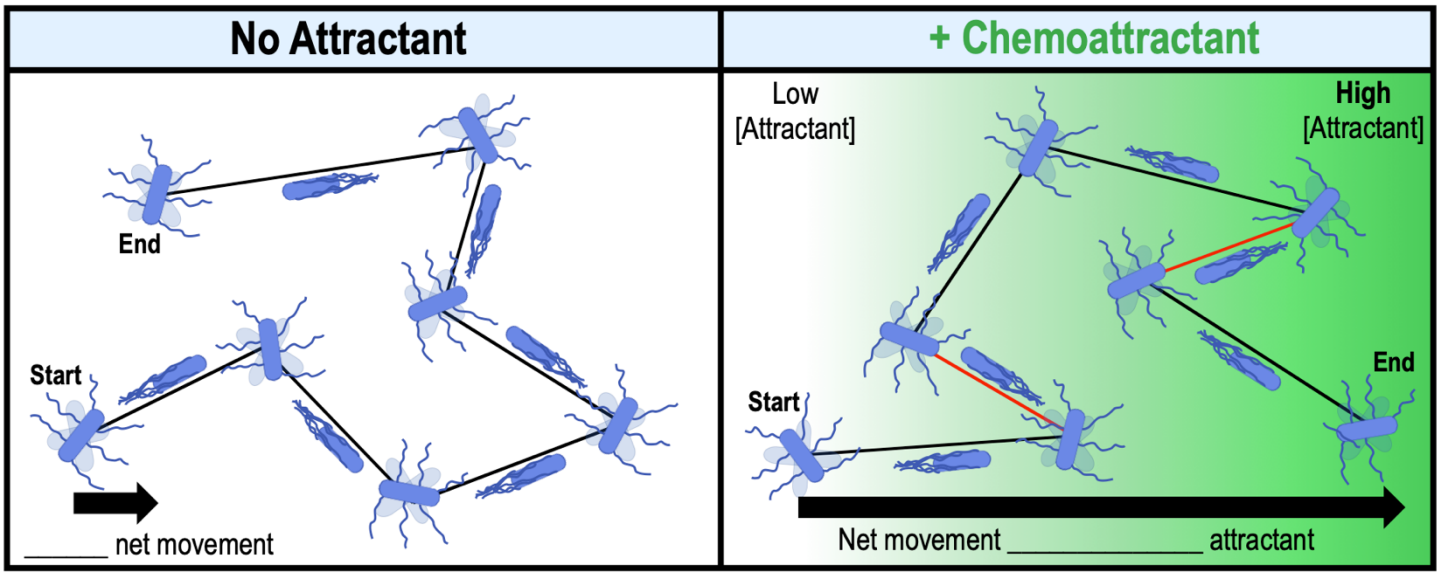
●When an *attractant* is present, a cell begins to move in the direction of _____ concentration.

□ Cells *sense* the concentration change & respond by controlling the *length* of each _____.

□ If concentration gets _____, the runs become ***longer***.

□ If concentration gets _____, the runs become *shorter*.

EXAMPLE: Swimming motility of a peritrichous cell in the absence & presence of a chemical attractant.



●The _____ effect occurs when a cell encounters a *repellent*.

PRACTICE: A common attractant for bacteria is glucose sugar. Bacteria placed in a cup of water with dissolved glucose are going to change their movements depending on the concentration of the glucose. If the concentration of glucose increases the bacteria will…

a) Have longer runs.
b) Have an increased number of tumbles.
c) Have shorter runs.

PRACTICE: If an E. coli bacterium finds itself moving away from an attractant how will its movements change?

a) The runs will become longer and the tumbles less frequent.
b) The runs will become shorter and the tumbles less frequent.
c) The runs will become longer and the tumbles more frequent.
d) The runs will become shorter and the tumbles more frequent.