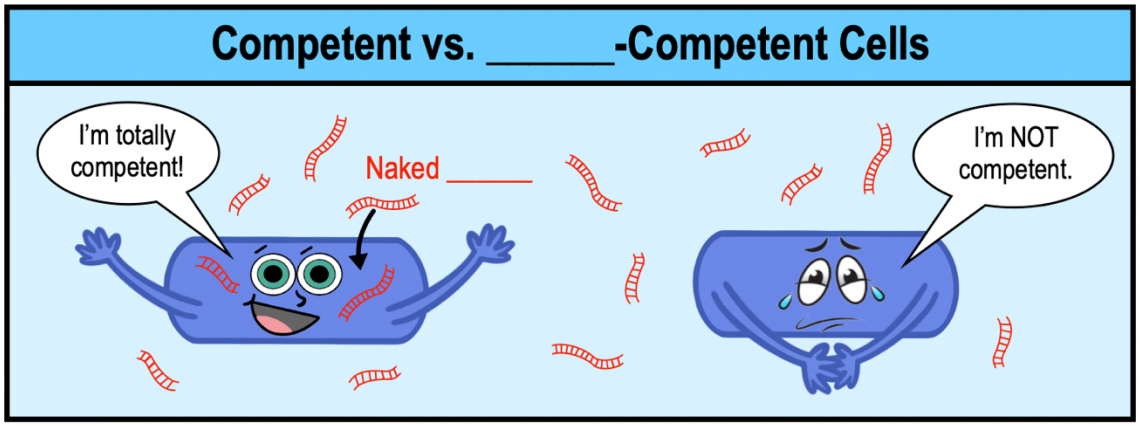
CONCEPT: BACTERIAL TRANSFORMATION

●*Recall:* **Transformation:** horizontal gene transfer by the uptake of free (naked) DNA in the *environment* by the cell.

●In order for a cell to transform DNA, it MUST be a _____ *cell.*

□ **Competent Cells:** have the _____ to transform DNA from the environment.

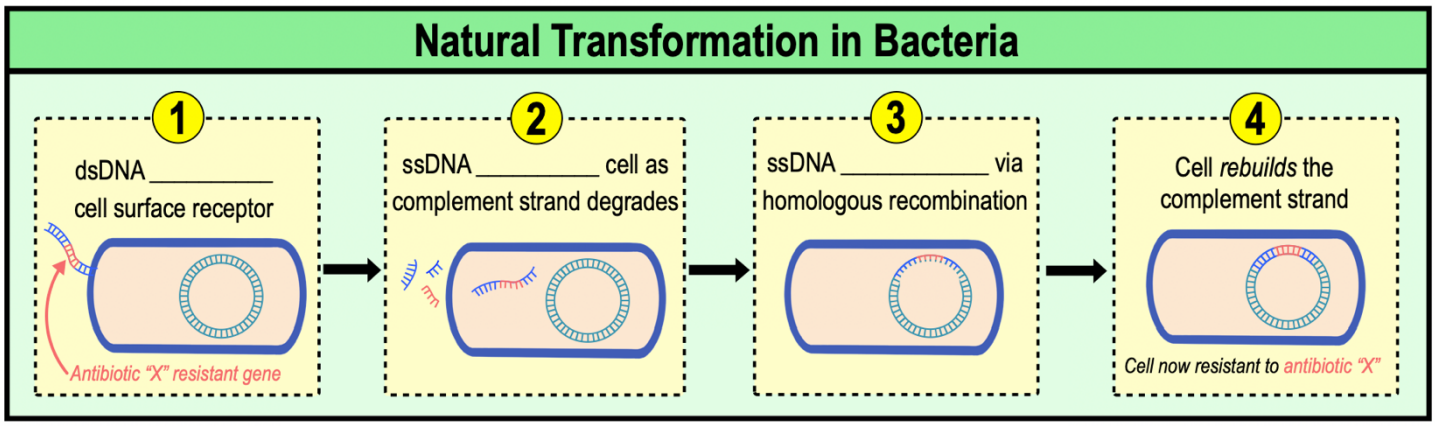


●Cells can be _____ competent or *induced* by chemical treatment.

Mechanism of Natural Transformation

●Cells that are *naturally competent* regularly transform DNA from the environment.

□ Natural transformation occurs in a series of _____ steps:



PRACTICE: What does it mean when a bacterial cell is *naturally competent*?

a) The bacterial cell is able to transform its chromosomal DNA into RNA.

b) The bacterial cell is able to transform DNA from their environment.

c) The bacterial cell is able to degrade viral DNA from attacking viruses.

d) The bacterial cell is able to take in naked DNA and incorporate that DNA into its genome.

e) A and C.

f) B and D.

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PRACTICE: Bacterial cells can become *competent* in two ways, which are:

a) Spontaneously.
b) Instinctively.
c) Horizontally.
d) Induced.
e) A and D.
f) A and C.
g) B and C.

PRACTICE: DNA transformation in bacteria is an important tool for DNA modification and cloning experiments. If the DNA being transformed by the bacteria contains antibiotic resistance genes, how does this help the scientists?

a) Antibiotics will kill any bacteria that did not naturally transform the transferred DNA.
b) It allows the scientists to identify which bacterial cells are competent and which cells are not.
c) It allows scientists to remove all bacteria that have not incorporated the experimental genes into their genome.
d) All of the above are reasons why antibiotic resistance is commonly used in transformation experiments.