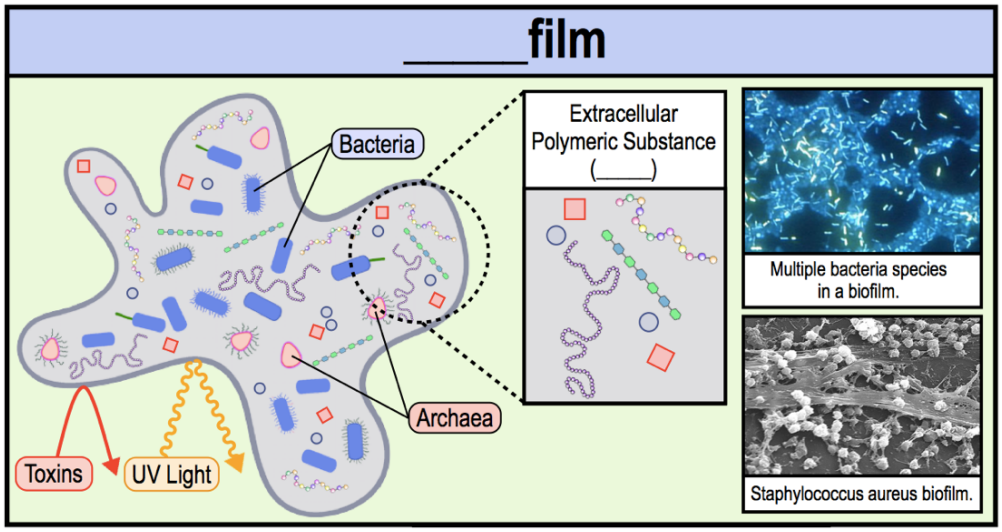
CONCEPT: BIOFILMS

●*Recall:* **biofilms** are _____ of cells encased in a slime-like layer anchored to a surface.

□ **Extracellular Polymeric Substance** (_____): sticky matrix secreted by cells that supports biofilm structure.

□ EPS _____ cells from harmful conditions such as UV light, chemical toxins, & antibiotics.

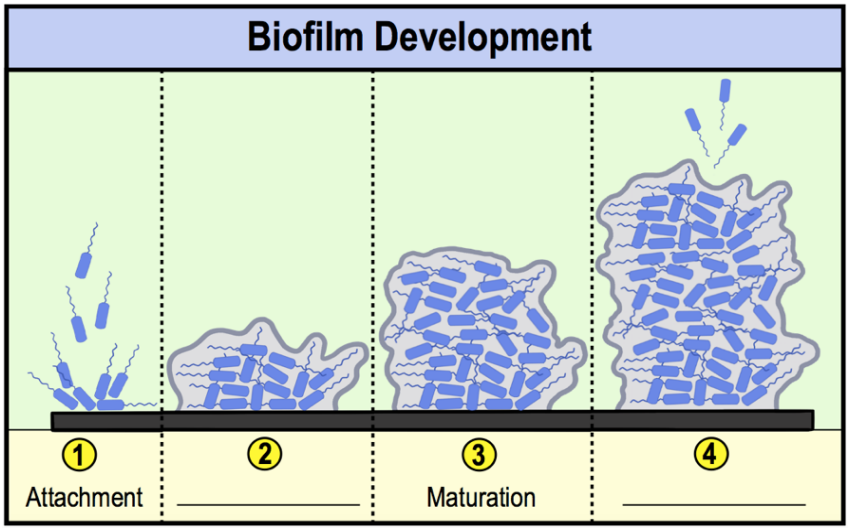
□ Resistance _____ are transferred between organisms through the DNA that is secreted into the EPS.



Steps of Biofilm Development

●Biofilm development occurs in _____ stages:

1. **Attachment**: cells _____ to surface (driven by fimbriae).
2. **Colonization**: cells multiply & _____ is produced.
3. _____: other cells attach & multiply as the EPS grows.
4. **Dispersal**: cells detach to create new _____.



●Cells within a biofilm can _____ *chemically* by the process of *quorum sensing*.

CONCEPT: BIOFILMS

PRACTICE: Biofilms:

a) Are a random accumulation of bacteria which are not able to communicate with each other.

b) Are a community of microorganisms protected by a polysaccharide and protein matrix.

c) Offer no protection against UV light or chemical toxins to microorganisms.

d) Are large groups of bacteria which are clones of a single parent cell.

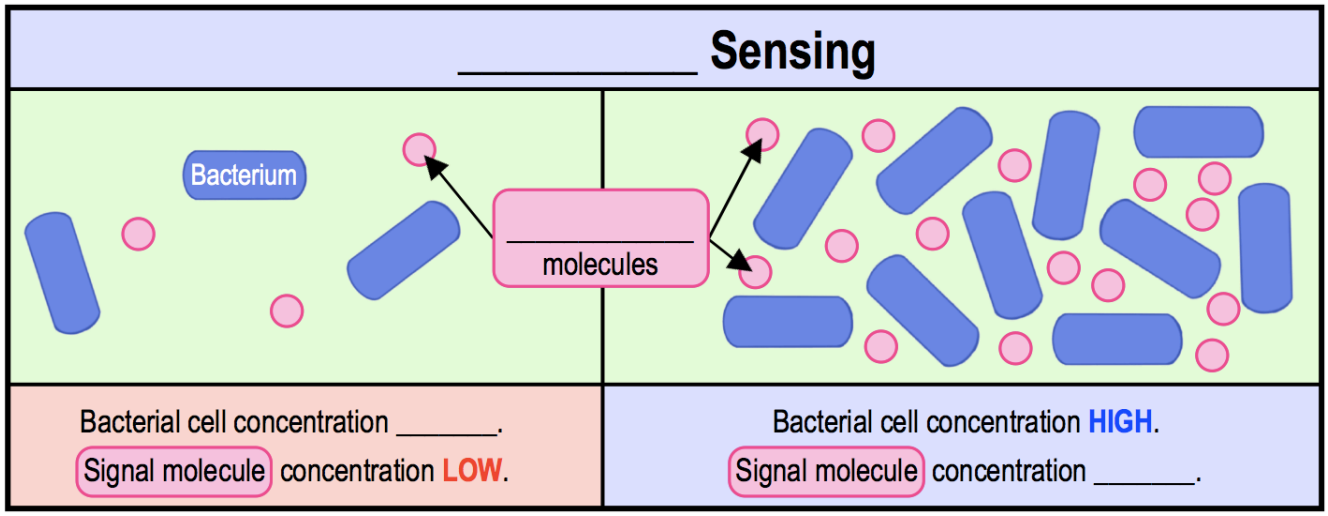
Quorum Sensing

●Biofilms contain many _____ cell types which can *communicate* with one another.

●**Quorum** _____**:** bacterial process of detecting their *own* population density or the presence of *other* cells.

□ Detects *extracellular signaling molecules* that are _____ by other cells in the EPS.

□ Signaling molecule concentration _____ with an increase in the *cell density.*



PRACTICE: What intercellular signaling method do bacterial cells within a biofilm use to understand their own population density?

a) Quorum sensing.

b) EPS sensing.

c) Dispersal sensing.

d) Quantum sensing.

PRACTICE: When will the quorum sensing signaling molecule be in high concentration during biofilm development?

a) During the attachment phase.

b) During the quorum phase.

c) When the bacterial population density is low.

d) When the bacteria population density is high.