

Key to Lecture Quiz #2

1. Define:

Antiporter – An antiporter is a protein complex associated with the cell membrane (integral proteins) and involved in the coupled transport of two different types of particles in opposite directions across the membrane. Antiporters are involved in secondary active transport, i.e., are dependent on prior “pumping” of particles by ATPase enzymes. An important antiporter is the protein complex moving one calcium ion (Ca^+) out by allowing three sodium ions (Na^+) to flow into a cell across the membrane. According to several sources, the sodium-potassium pump described in lecture is not an antiporter because it is an ATPase enzyme. However, the function of this ATPase is essential to the function of antiporters.

Smooth endoplasmic reticulum – The smooth endoplasmic reticulum (endoplasmic = within the protoplasm, and reticulum = net) is a type of organelle made up of flattened sacs or tubules of membrane that extend from the nucleus into the cytoplasm (it is connected to the nuclear envelope). The smooth ER is involved in transport, storage and the synthesis of lipids. It does not have ribosomes attached, so is not involved in protein synthesis.

Kinesin – Kinesin is a type of motor protein associated with microtubules (a microtubule associated protein or MAP). There are multiple different types of kinesin, but those described and shown in lecture “walk” along microtubules and transport vesicles from one region to another within the cell. The energy required for the “walking” action is supplied by ATP.

2. Cell membrane, cytoplasmic membrane, or plasma membrane
3. Facilitated diffusion/ concentration and/or electrical gradients
4. Osmosis/ the RBCs would take on water very rapidly and blow up
5. Phagocytosis
6. Negative chemotaxis/ quorum sensing
7. Ribosomes/ Golgi apparatus, complex or body
8. Contractile vacuoles
9. Lysosomes and peroxisomes
10. Mitochondria and chloroplasts/ ccc-DNA (ccc = covalently-closed, circular)
11. Microtubules
12. Actin

The most common etiological agents of toxic shock syndrome are identified as *Streptococcus pneumoniae*