

Cell Membrane Transport- Fill-in-the-Blank Questions

<https://www.youtube.com/watch?v=knv4fNNoEG8>

Questions

1. **Rule of Thumb for Transport Size:** According to the video's general rule of thumb, as the size of a passenger or waste product increases, the cell requires a bigger _____ to transport it across the cell membrane.
2. **Potassium Leak Channels:** Because potassium ions maintain a high intracellular concentration, opening a leak channel causes potassium to naturally flow down its concentration gradient to the outside of the cell via _____ diffusion.
3. **Baseline Sodium Distribution:** Under standard physiological conditions, sodium ions maintain a significantly higher concentration _____ the cell compared to the inside.
4. **Energy Expenditure in Leak Channels:** The movement of potassium out of a cell through a leak channel is categorized as passive transport because it requires zero expenditure of cellular _____.
5. **Channel-Mediated Passive Movement:** Unlike simple diffusion of solutes through free space, passive ion movement through a membrane protein channel is specifically classified as _____ diffusion.
6. **Sodium-Potassium Pump Function:** Pushing sodium out of the cell and potassium into the cell against their respective concentration gradients requires energy supplied by a molecule of _____.
7. **ATP Hydrolysis Products:** When the sodium-potassium pump hydrolyzes ATP, adenosine triphosphate breaks down into adenosine diphosphate and a free _____ group.
8. **Direct Energy Classification:** Because the sodium-potassium pump uses ATP directly to drive ions against their concentration gradients, it is categorized as _____ active transport.
9. **Intestinal Epithelial Cells:** In the gastrointestinal tract, specialized cells lining the intestine called _____ take up sodium along with dietary glucose.
10. **Cotransport in the Gut:** When sodium and glucose move simultaneously in the exact same direction across the membrane into an enterocyte, the mechanism is called _____.
11. **Indirect Energy Coupling:** Glucose uptake alongside sodium in the enterocyte is an example of _____ active transport because it relies on a pre-established sodium gradient rather than direct ATP breakdown by the transporter itself.

12. **Exchange into the Bloodstream:** When glucose leaves an enterocyte into a neighboring capillary while sodium flows in the opposite direction into the cell, the transport mechanism is called _____.
13. **Renal Secondary Active Transport:** Outside of the digestive system, secondary active transport mechanisms play a vital role in the nephron of the _____.
14. **Bulk Cargo Import:** To import large proteins composed of amino acids into the cell, a pocket of cell membrane pinches off around the cargo to form a _____, which then fuses with the membrane during endocytosis.
15. **Energy Demand for Endocytosis:** Importing large macromolecules through endocytosis requires a _____ amount of direct cellular energy.
16. **Organelle of Origin for Secretion:** Intracellular vesicles carrying proteins or neurotransmitters destined for cellular export originate from an organelle known as the _____ apparatus.
17. **Neurotransmitter Secretion:** The process of releasing neurotransmitters such as acetylcholine into the extracellular space by fusing an intracellular vesicle with the cell membrane is called _____.
18. **Directionality of Bulk Transport:** While endocytosis transports large cargo into the cell, exocytosis is the process where material is _____ the cell.
19. **Pathological Hijacking:** Understanding cellular transport mechanisms is clinically crucial because infectious agents such as _____ can hijack these transport systems to cause disease.
20. **Passive vs. Active Classification:** Membrane transport mechanisms that move solutes down their concentration gradient without energy are classified as _____ transport, whereas moving solutes against their gradient requires energy and is classified as active transport.