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Lysosomes

Exam — Cell Organelles

Pre-Med practice questions about lysosomal structure and function

7 items — Printable Exam

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1 **Which statement best describes the internal environment and function of a lysosome?**

A It has a neutral pH and contains enzymes that function optimally at pH 7.

B It has an acidic lumen containing hydrolytic enzymes that degrade macromolecules.

C It has an alkaline lumen used for ATP synthesis.

D It stores Ca^{2+} for rapid release during signaling.

E It specializes in beta-oxidation of very-long-chain fatty acids.

2 **Proton pumps in the lysosomal membrane are directly responsible for:**

A Importing lysosomal enzymes from the cytosol.

B Maintaining the acidic pH required for lysosomal enzyme activity.

C Transporting digested amino acids into the cytosol.

D Generating ATP within the lysosome.

E Driving exocytosis of lysosomal contents.

3 **A macrophage engulfs a bacterium by phagocytosis. For the bacterium to be digested, the phagocytic vesicle must:**

A Fuse with the Golgi apparatus to receive acid hydrolases.

B Fuse with a lysosome to form a phagolysosome.

C Migrate to the nucleus for degradation.

D Be exported from the cell by exocytosis.

E Remain isolated in the cytosol until the bacterium dies.

4 **In a genetic disorder, acid hydrolases fail to reach lysosomes and are instead secreted outside the cell. Which step is most likely defective?**

A Synthesis of hydrolases on free ribosomes in the cytosol.

B Addition of mannose-6-phosphate to hydrolases in the Golgi apparatus.

C Fusion of lysosomes with the plasma membrane.

D Assembly of ribosomes in the nucleolus.

E Oxidative phosphorylation in mitochondria.

5 **Which process is most directly associated with lysosomal function in non-plant eukaryotic cells?**

A Maintenance of turgor pressure.

B Photosynthesis.

C Autophagy of damaged organelles.

D Beta-oxidation of very-long-chain fatty acids.

E Storage of genetic information.

6 **A drug prevents acidification of endosomes and lysosomes but does not affect vesicle formation or fusion. In receptor-mediated endocytosis of LDL (low-density lipoprotein), which step is most directly impaired?**

A Binding of LDL to its receptor at the plasma membrane.

B Internalization of receptor–LDL complexes into clathrin-coated vesicles.

C Dissociation of LDL from its receptor and subsequent degradation of LDL in lysosomes.

D Recycling of empty LDL receptors back to the plasma membrane.

E Synthesis of LDL receptors in the rough endoplasmic reticulum.

7 **In a lysosomal storage disease caused by deficiency of a single lysosomal hydrolase, affected cells typically show which morphological feature?**

A Complete absence of lysosomes.

B Accumulation of undigested substrate within enlarged lysosomes.

C Massive proliferation of peroxisomes containing excess catalase.

D Condensed chromatin and nuclear fragmentation typical of mitosis.

E Absence of mitochondria, with ATP produced only by glycolysis.

Answer Key

#	Ans	Answer Text
1	B	It has an acidic lumen containing hydrolytic enzymes that degrade macrom...
2	B	Maintaining the acidic pH required for lysosomal enzyme activity.
3	B	Fuse with a lysosome to form a phagolysosome.
4	B	Addition of mannose-6-phosphate to hydrolases in the Golgi apparatus.
5	C	Autophagy of damaged organelles.
6	C	Dissociation of LDL from its receptor and subsequent degradation of LDL ...
7	B	Accumulation of undigested substrate within enlarged lysosomes.