B2.2 Organelles and compartmentalization (HL)

What the Cell · DP Biology · worksheet · HL statements B2.2.4–9

Name _____ **Date** _____ **Total** _____ / 30

About 30 minutes, or one section at a time. The number of marks shows how many separate points to make.

Section A: Recall

7 marks

1 **State** the role of the cristae of a mitochondrion. B2.2.4 **[1]**

2 **State** where the enzymes of the Calvin cycle are found in a chloroplast. B2.2.5 **[1]**

3 **State** one molecule that leaves the nucleus through the pores, and one that enters. B2.2.6 **[2]**

4 **Name** the protein that forms a coat around vesicles in receptor-mediated endocytosis. B2.2.9 **[1]**

5 **State** two ways in which the Golgi apparatus modifies proteins. B2.2.8 **[2]**

Section B: Understanding

11 marks

6 **Explain** how the small volume inside thylakoids helps a chloroplast make ATP. B2.2.5 **[2]**

7 **Explain** why the nuclear envelope breaks into vesicles at the start of mitosis. B2.2.6 **[2]**

8 **Distinguish** between the proteins made by free ribosomes and by ribosomes on the rough ER. B2.2.7 **[2]**

9 **Outline** how a protein is processed as it passes through the Golgi apparatus. B2.2.8 **[3]**

10 **Explain** how clathrin helps a vesicle form. B2.2.9 **[2]**

Section C: Working with evidence

8 marks

All data in this section are invented for practice. The patterns are realistic.

11 B2.2.7, B2.2.8, B2.2.9

Pancreas cells that secrete digestive enzymes were given radioactive amino acids for 3 minutes, then non-radioactive ones. Samples were taken at intervals, and the percentage of the radioactivity in each structure was measured.

Time after start / min	Rough ER / %	Golgi apparatus / %	Secretory vesicles / %
3	86	6	2
20	43	41	9
120	4	14	70

a **Identify** where most of the radioactivity was after 3 minutes. **[1]**

b **Describe** the changes in radioactivity in the Golgi apparatus. **[2]**

c **Deduce** the route taken by the newly made proteins, using the data. **[2]**

d **Explain** why little radioactivity was found in free ribosomes or the cytoplasm. **[1]**

e **Suggest** two reasons why these cells were chosen for this experiment. **[2]**

Section D: Longer answer

4 marks

12 **Explain** how the structure of a mitochondrion is adapted for producing ATP. B2.2.4 **[4]**