A2.2 Cell structure (HL)

What the Cell · DP Biology · worksheet · HL statements A2.2.12–14

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** three features of mitochondria that suggest they were once free-living bacteria. A2.2.12 **[3]**

2 **Name** the group of bacteria whose DNA is most similar to chloroplast DNA. A2.2.12 **[1]**

3 **Define** proteome. A2.2.13 **[1]**

4 **State** two advantages of being multicellular. A2.2.14 **[2]**

Section B: Understanding

11 marks

5 **Outline** how chloroplasts are thought to have arisen by endosymbiosis. A2.2.12 **[3]**

6 **Explain** why mitochondria have two membranes. A2.2.12 **[2]**

7 **Explain** how cells with identical genomes become specialized for different functions. A2.2.13 **[3]**

8 **Explain** why multicellularity is thought to have evolved many times. A2.2.14 **[2]**

9 **Suggest** one disadvantage to a cell of being highly specialized. A2.2.13 **[1]**

Section C: Working with evidence

8 marks

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

10 A2.2.12

Liver cells were broken open and separated into two fractions: the cytoplasm (without organelles) and isolated mitochondria. Each fraction was given radioactive amino acids, with or without an antibiotic. Protein synthesis was measured as a percentage of the rate with no antibiotic.

Antibiotic	Cytoplasm / %	Isolated mitochondria / %
Chloramphenicol	97	8
Cycloheximide	4	95

a **Identify**, with a reason, which antibiotic blocks 80S ribosomes. **[1]**

b **Compare** the effects of the two antibiotics on the two fractions. **[2]**

c **Explain** how these results support the endosymbiotic theory. **[2]**

d Chloramphenicol is used to treat some bacterial infections. **Suggest** why high doses can harm human tissues that use a lot of energy. **[2]**

e **State** the purpose of measuring protein synthesis with no antibiotic. **[1]**

Section D: Longer answer

4 marks

11 **Discuss** how strongly the evidence supports an endosymbiotic origin of chloroplasts. A2.2.12 **[4]**