



(b) The link reaction takes place in mitochondria.

Which row of the table shows the correct substances produced by the link reaction?

(1)

	Carbon dioxide	ATP	Reduced NAD
<input type="checkbox"/> <b>A</b>	no	no	no
<input type="checkbox"/> <b>B</b>	no	yes	no
<input type="checkbox"/> <b>C</b>	yes	yes	yes
<input type="checkbox"/> <b>D</b>	yes	no	yes

Which of the following, **A** to **D**, is the correct summary of the net products of the Krebs cycle for **one** molecule of pyruvate?

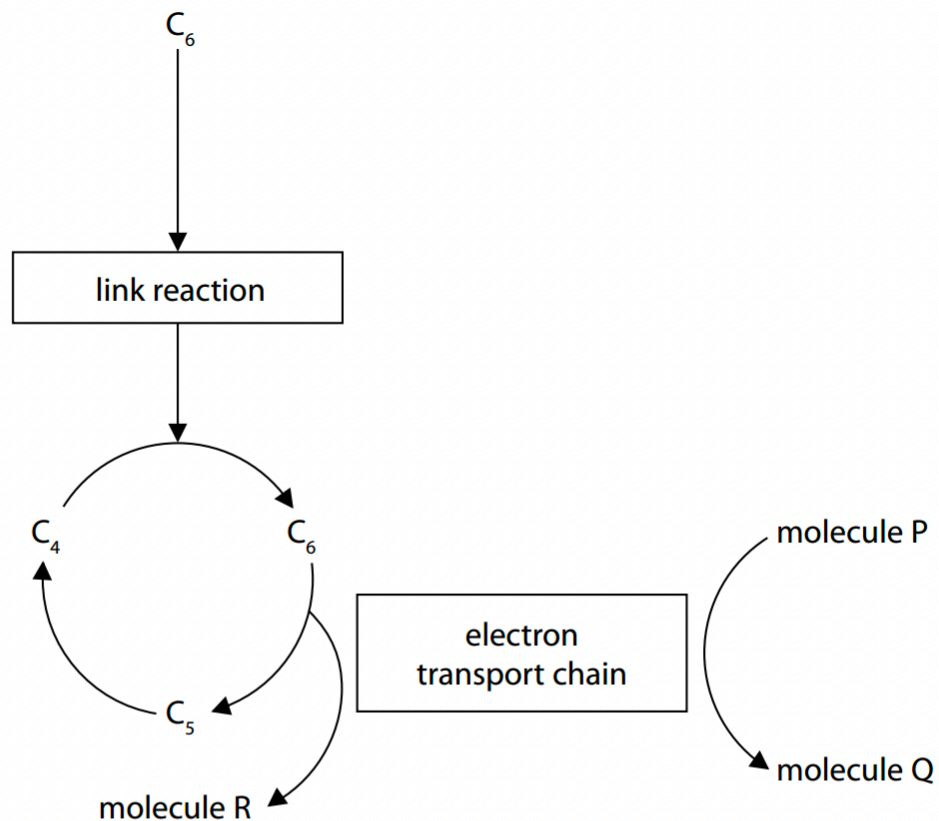
- A** 3 reduced NAD, 1 reduced FAD, 2 CO<sub>2</sub>, 1 ATP
- B** 2 reduced NAD, 2 CO<sub>2</sub>, 2 ATP
- C** 4 reduced NAD, 2 reduced FAD, 3 CO<sub>2</sub>, 2 ATP
- D** 2 reduced NAD, 1 reduced FAD, 3 ATP

Your answer

[1]



(d) The diagram shows some of the stages of aerobic respiration.



(i) Which row of the table correctly describes molecule R and molecule Q?

(1)

	<b>Molecule R</b>	<b>Molecule Q</b>
<input checked="" type="checkbox"/> <b>A</b>	ATP	oxygen
<input checked="" type="checkbox"/> <b>B</b>	carbon dioxide	water
<input checked="" type="checkbox"/> <b>C</b>	reduced NAD	carbon dioxide
<input checked="" type="checkbox"/> <b>D</b>	ATP	reduced NAD



2 ATP can be produced in various ways. Each stage of respiration contributes to the production of ATP.

(a) Describe the production of ATP by **substrate-level phosphorylation** in different stages of respiration with reference to the number of ATP molecules produced.

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[4]

Malonate inhibits a reaction in the Krebs cycle.

Explain why malonate would decrease the uptake of oxygen in a respiring cell.

[2 marks]

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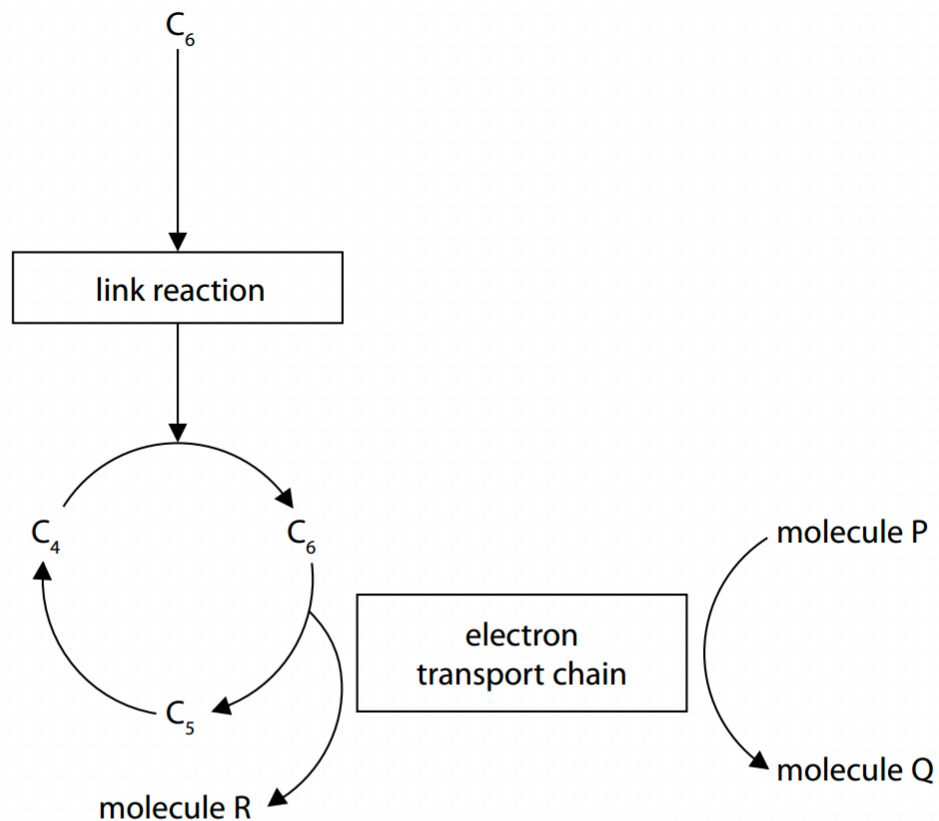
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B



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<input type="checkbox"/> <b>C</b>	yes	yes	yes
<input type="checkbox"/> <b>D</b>	yes	no	yes

D

Which of the following, **A** to **D**, is the correct summary of the net products of the Krebs cycle for **one** molecule of pyruvate?

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- C** 4 reduced NAD, 2 reduced FAD, 3 CO<sub>2</sub>, 2 ATP
- D** 2 reduced NAD, 1 reduced FAD, 3 ATP

Your answer

**A**

[1]





2 ATP can be produced in various ways. Each stage of respiration contributes to the production of ATP.

(a) Describe the production of ATP by **substrate-level phosphorylation** in different stages of respiration with reference to the number of ATP molecules produced.

1. 2 (ATP molecules per glucose) from, glycolysis / (breakdown of) triose (bis)phosphate ✓
2. (when) triose (bis)phosphate / TP, converted / broken down, to pyruvate ✓
3. ref to net yield of 2 (ATP) / 4 (ATP) made but 2 used up ( in glycolysis) ✓
4. 1 ATP (produced) per, (turn of the) Krebs cycle / acetyl (coA) ✓
5. when 5-carbon compound is converted to, 4-carbon compound / oxaloacetate ✓

**1 ALLOW** '4 ATP made from 2 TP's'

3 'net yield of 2 ATP's in glycolysis' = mp1 and 3 for 2 marks

**4 ALLOW** 2ATP, per glucose in Krebs cycle / from every 2 acetyl (coA)

**5 ALLOW** 'when citrate converted to oxaloacetate'

**5 ALLOW** 'when succinyl CoA converted into succinate'

**5 ALLOW** 'between (intermediate) 4C compounds'

[4]

Malonate inhibits a reaction in the Krebs cycle.

Explain why malonate would decrease the uptake of oxygen in a respiring cell.

[2 marks]

1. Less/no reduced NAD/coenzymes

OR

Fewer/no hydrogens/electrons removed (and passed to electron transfer chain);

2. Oxygen is the final/terminal (electron) acceptor;

1. Accept less/no FAD reduced.