IGCSE BIOLOGY • EXERCISE SHEET

12.3 Anaerobic respiration

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

Objective

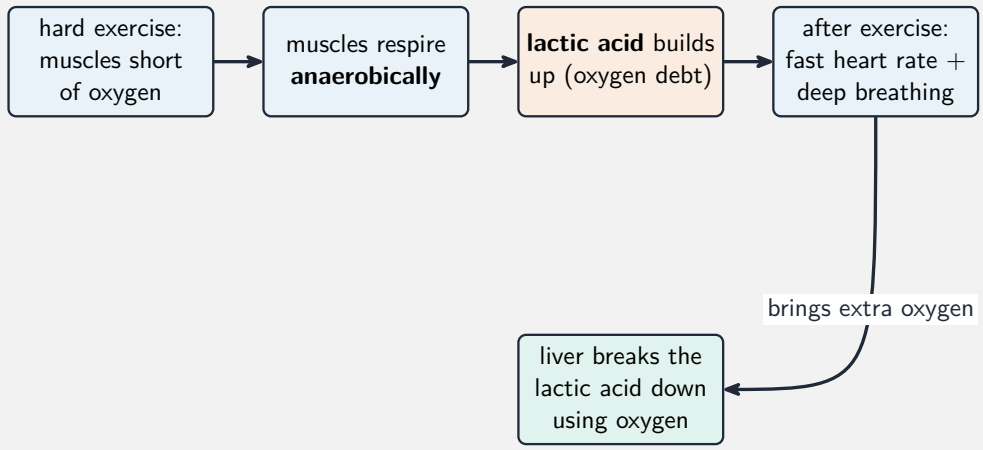
Build the skills to answer exam questions on **anaerobic respiration** 无氧呼吸—the equations in yeast and muscle, and the **oxygen debt** 氧债.

You must be able to:

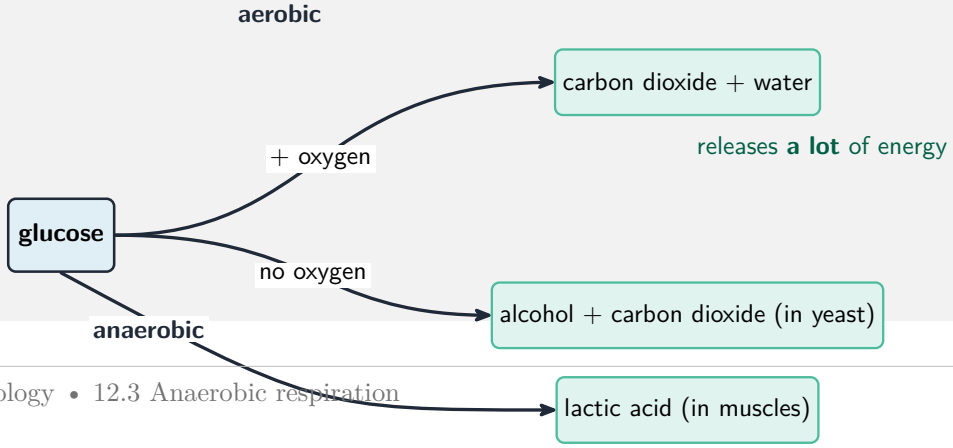
- write the anaerobic equations for yeast and for muscle
- compare the energy released with aerobic respiration
- explain the oxygen debt and how it is repaid

1 Worked examples

Anaerobic respiration & oxygen debt



Anaerobic respiration: no oxygen, much less energy



- **yeast:** glucose → alcohol + carbon dioxide.
- **muscle:** glucose → lactic acid → an **oxygen debt** (extra O needed later).

2 Practice

2.1 Write the word equation for anaerobic respiration in yeast. [2]

2.2 Name the substance that builds up in muscles during hard exercise. [1]

3 Exam-style questions

3.1 Compared with aerobic respiration, anaerobic respiration releases: [1]

- **A** more energy
- **B** much less energy
- **C** the same energy
- **D** no energy

3.2 During a sprint the muscles respire anaerobically.

(a) Write the equation for anaerobic respiration in muscle. [1]

(b) Explain what is meant by an oxygen debt. [2]

3.3 Describe how the oxygen debt is repaid after exercise. [2]

4 Go further

You are now ready for the real exam questions on this subtopic. Open the **12.3 Anaerobic respiration** past-paper sheet in the Library, or try these in **Practice mode**:

- 0610/21 N25 —Q19 (anaerobic respiration)
- 0610/22 N25 —Q17 (oxygen debt)

Solutions

2.1 glucose → alcohol + carbon dioxide.

2.2 lactic acid.

3.1 B. Anaerobic respiration releases much less energy.

3.2 (a) glucose → lactic acid.
(b) it is the extra oxygen needed after exercise to break down the lactic acid that built up.

3.3 the heart rate stays high and breathing stays deep, bringing extra oxygen; the liver uses it to break down the lactic acid.