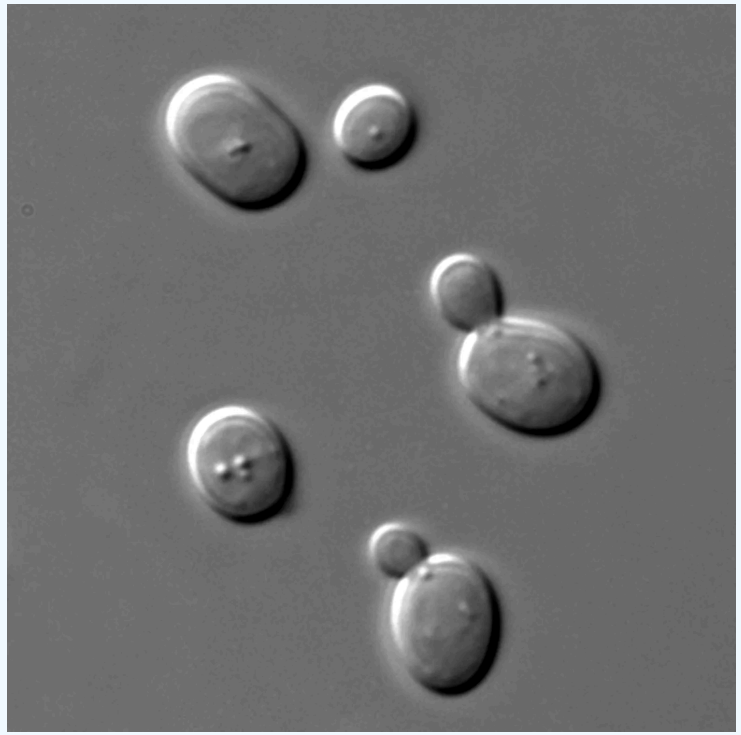
Biology 20

## Unit C: Photosynthesis and cellular respiration

# Routes when oxygen is scarce

# Three branches from pyruvate

- The oxygen branch shows a mitochondrion and a tall ATP stack.
- Muscle shows lactic acid and a short stack. Yeast shows alcohol, carbon dioxide, and a short stack.



## Oxygen and ATP yield

- Aerobic respiration uses the mitochondrion and builds many ATP.
- Fermentation in muscle yields lactic acid and a short ATP count.
- Fermentation in yeast yields alcohol and carbon dioxide, also with a short count.

# Key terms

**fermentation**

An anaerobic route that recycles pyruvate into lactic acid or into alcohol and carbon dioxide, with a small ATP yield.

**metabolic toxin**

A substance such as cyanide or hydrogen sulfide that blocks the aerobic path in the mitochondrion.

**aerobic respiration**

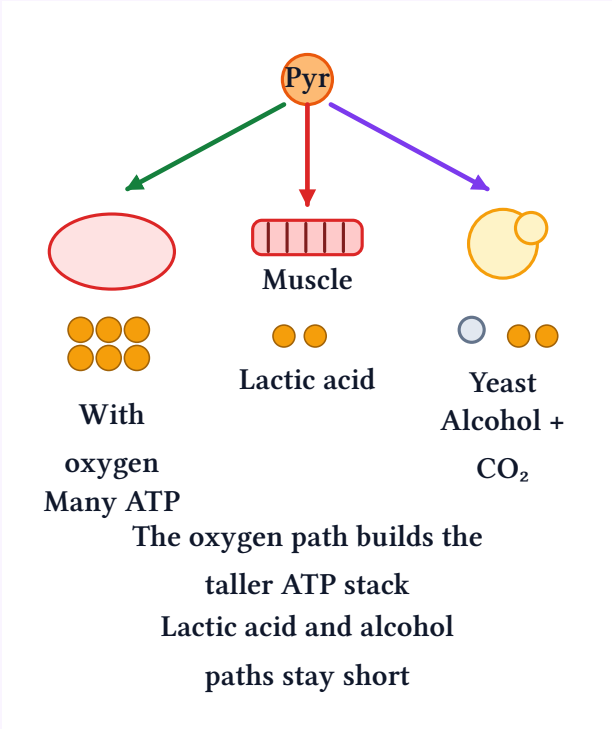
The oxygen-using path through the mitochondrion that builds the larger ATP yield.

**lactic acid**

The product muscle cells form from pyruvate when oxygen delivery lags behind a sprint.

# Each route matches one kind of cell

- The tall stack sits on the branch labelled with oxygen.
- The striped fibre is the lactic acid branch.
- The budding cell is the alcohol and carbon dioxide branch.



# Pea respiration data

- Germinating peas consume more oxygen and warm more.
- Dry dormant peas stay cooler and use less oxygen.

# Checking a source on toxins

- A toxicology report names the chemical and the evidence.
- An advertisement is a weaker source for a health claim.

## Three branches

- Compare ATP yield for oxygen, lactic acid, and alcohol.
- Name one industrial toxin that blocks the aerobic path.

# The body has organs for these exchanges

- Cells still depend on food in and gases exchanged.
- Human organs are the next place those exchanges are organized.

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