

Chemiosmosis

Biology

How a proton gradient becomes ATP, in mitochondria and chloroplasts.

Mitchell's chemiosmotic theory.

1

Electrons pass down the chain

Through carriers in the inner membrane, releasing energy.

2

Protons pumped across

Into the intermembrane space, building a gradient.

3

Electrochemical gradient forms

Both a concentration and a charge difference.

4

Protons flow back through ATP synthase

The only route available.

5

ATP synthase rotates

Mechanical rotation drives ATP synthesis.

WHY OXYGEN MATTERS

Oxygen is the final electron acceptor

Without it the chain backs up

Nothing pumps, no gradient, no ATP

The same mechanism runs in chloroplasts, driven by light rather than by electrons from food.