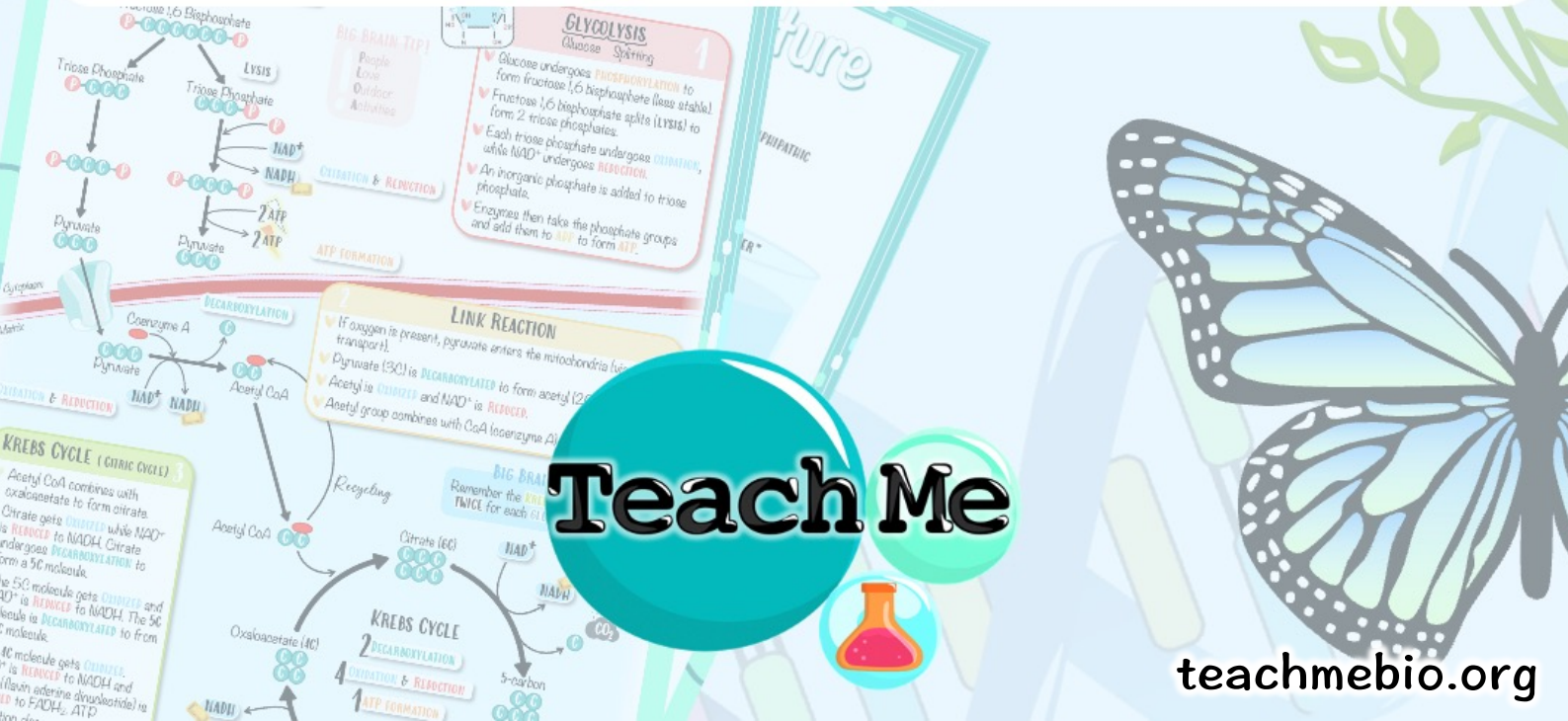
TeachMe

STUDY NOTES

B3.1 GAS EXCHANGE



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Gas Exchange

GAS EXCHANGE refers to the process by which oxygen (O_2) is taken in from the external environment and carbon dioxide (CO_2) is expelled from an organism.

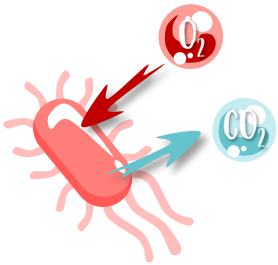
Aerobic organisms:
Require oxygen to metabolize energy from organic substances such as glucose. They can include;

I. Unicellular organisms
e.g. bacteria

II. Multicelluar organisms
e.g. animals and plants
- A. MAMMALS
- B. FISH
- C. PLANTS

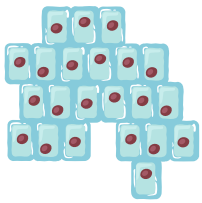
I. GAS EXCHANGE IN SINGLE CELLED ORGANISMS

Occurs directly with the atmosphere as the gases can freely diffuse in and out of the cell. This is due to their large surface area to volume ratio.



II. GAS EXCHANGE IN MULTICELLULAR ORGANISMS

Cannot occur freely with the atmosphere (some cells if not the majority are **NOT** in direct contact with the atmosphere). And their surface area to volume ratio is too small (thus inefficient)



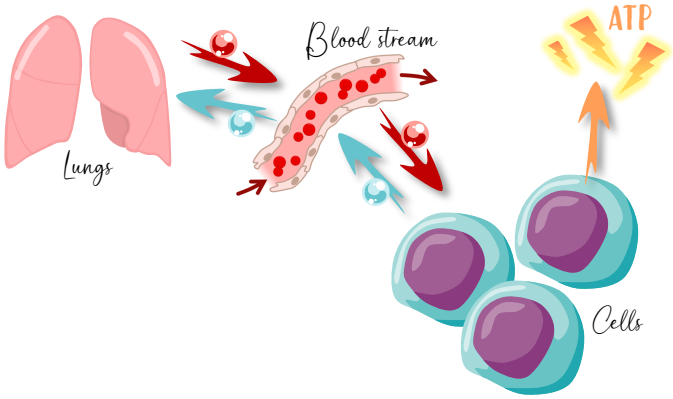
The cells are usually well organised and compact. This prevents them from all being in contact with the atmosphere (realise also this is 3D)

A. MAMMALS

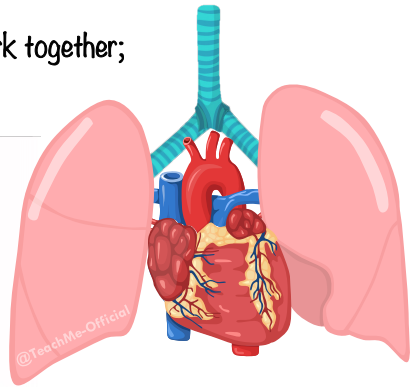
Why do we even need gas exchange?

ATP

For **ENERGY!** Oxygen is needed for our cells to create ATP (energy) during the process of **CELLULAR RESPIRATION** (learned in topic C1.2) to function. In the process, carbon dioxide is created as a waste product and must then be excreted in exchange for new oxygen.



Two body systems work together;



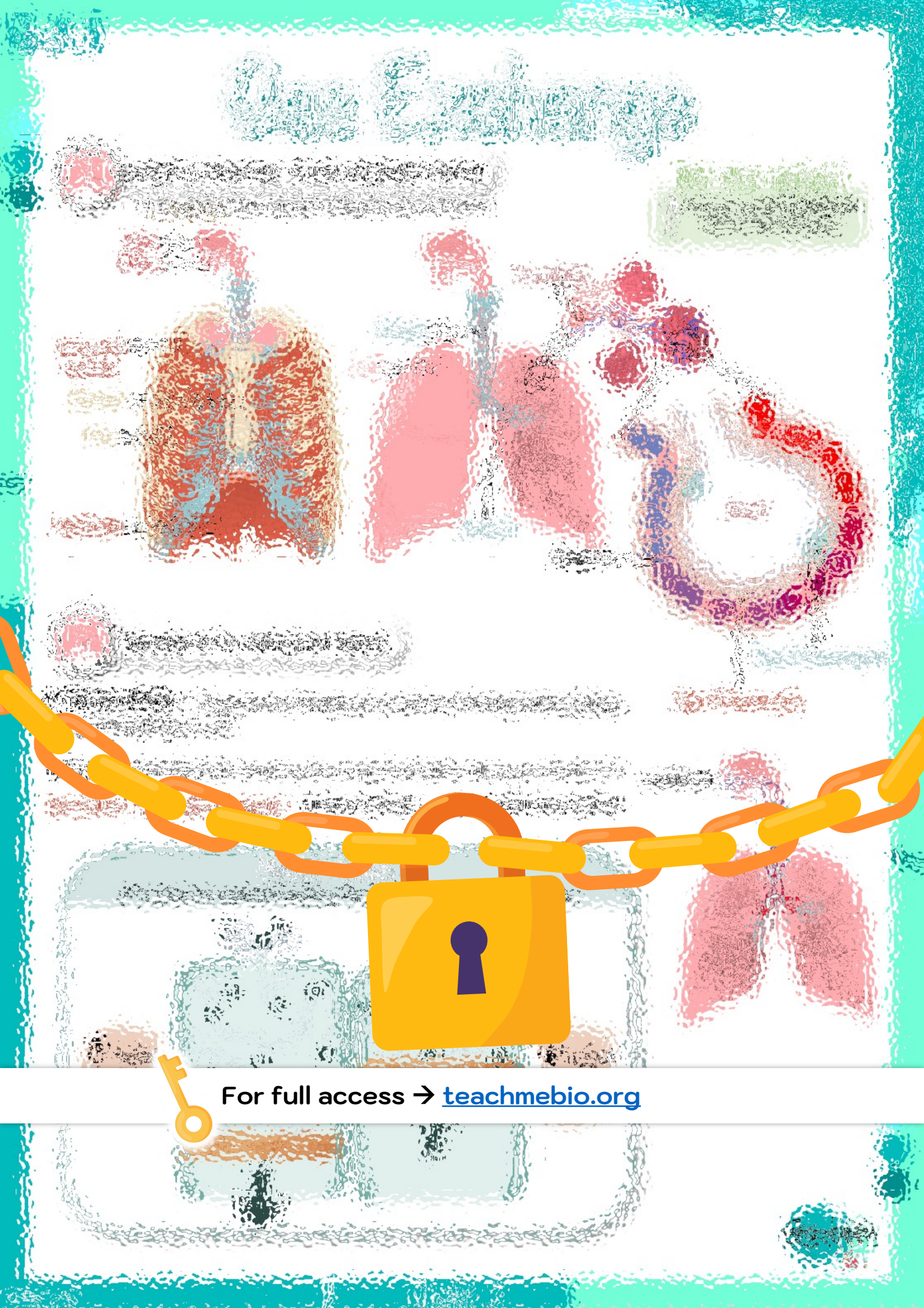
RESPIRATORY SYSTEM
(lungs)

Helps bring air (containing oxygen) into our body and into the blood stream*.

CARDIOVASCULAR SYSTEM
(heart and vessels)

Helps us distribute the blood (containing nutrients, oxygen and carbon dioxide) to all the cells of our body, and back to the lungs to dispose of the waste (carbon dioxide).

* You will learn in section B3.2 more about the circulation of blood between the lungs and the heart.



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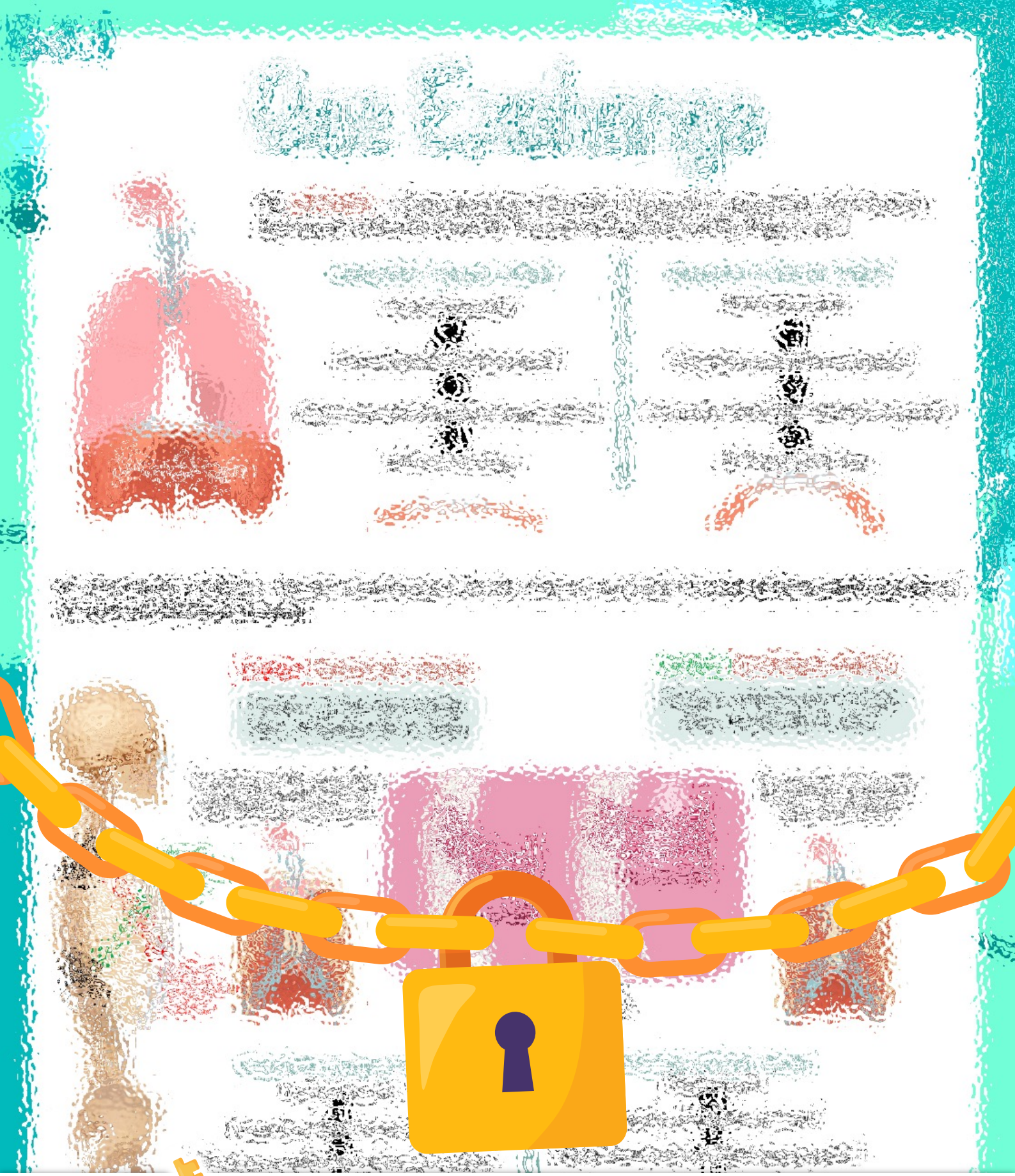

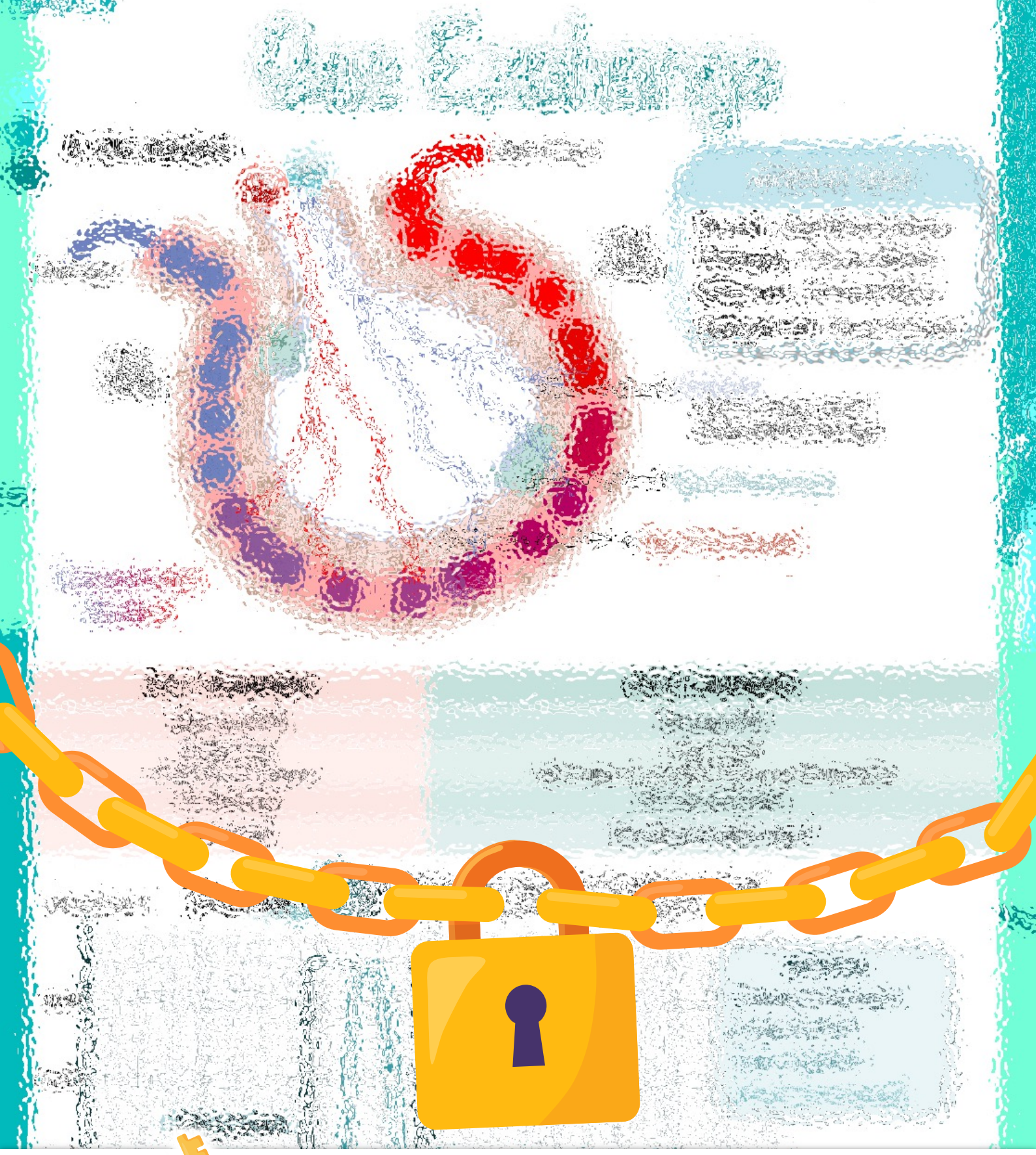

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