

How the Body Makes External Combustion Internal

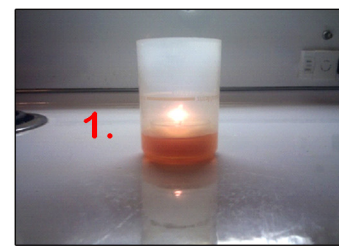
1. A votive candle burning in a bowl exemplifies external combustion or an **open system**.
2. Sealing the top with a dish makes it a **closed system**.

Once converted to a closed system, it took 27 seconds for combustion to cease.

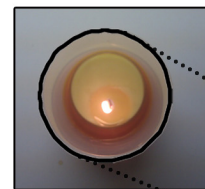
Your cells in your body are sealed off from O₂, similarly to the covered bowl. The 'problem' with creating a closed system is obvious; combustion ceases once the O₂ inside the bowl is consumed. This explains why brain cells die within approximately 4 minutes without O₂; cutting off O₂ supply shuts down the metabolism of fuel substrate, and cells quickly die from 'suffocation'.

How to make external combustion internal is obvious once you see how it's done.

1. A votive candle placed inside a plastic cup represents a cell.



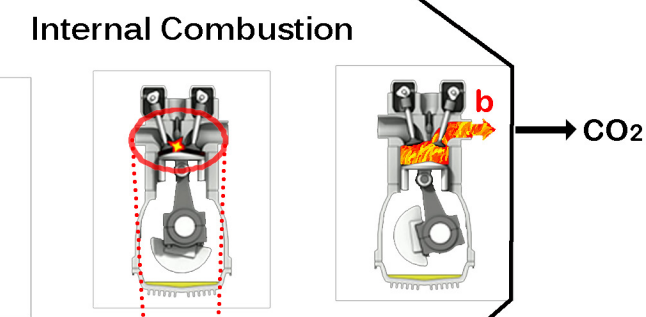
Bird's eye view



2. I drilled two holes and inserted two straws.

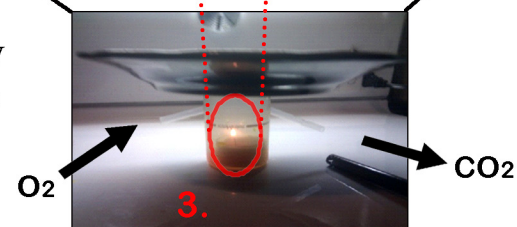


Once the top is covered each straw serves as an inlet and outlet for O₂ and CO₂.



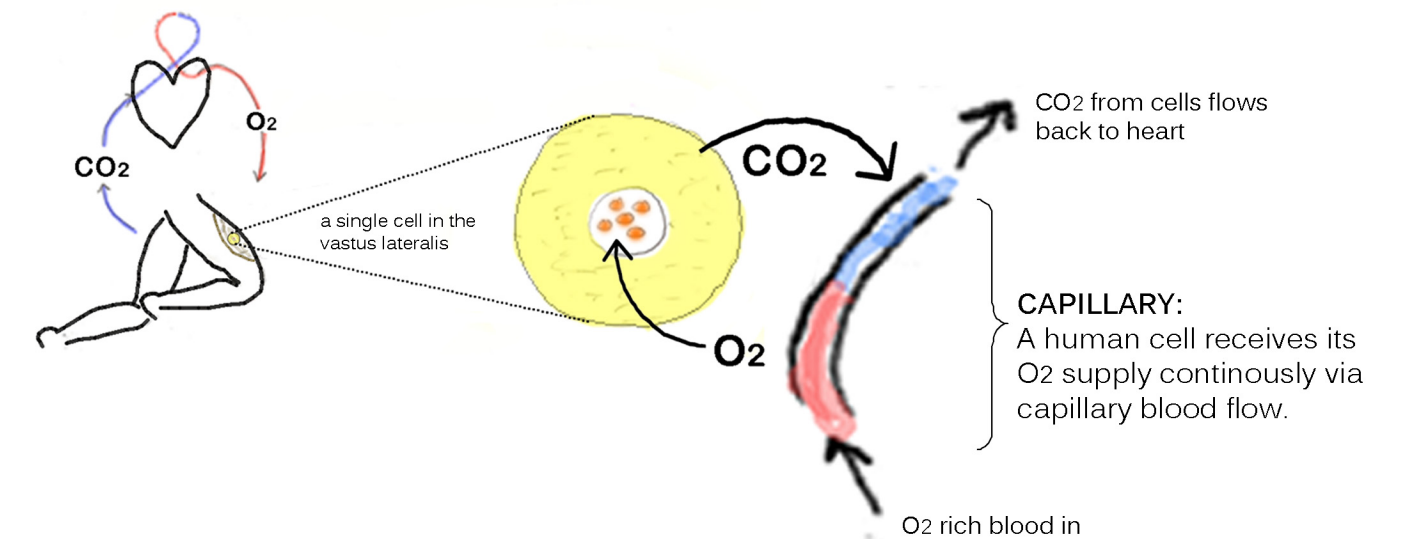
Similarly, an internal combustion engine requires an inlet valve (a) and an outlet valve (b) to supply O₂ and to exhaust CO₂.

3. Despite the cover, O₂ is now continuously transported into the cell.



A Human Cell Receives O₂ Continuously via Blood Flow.

A **single capillary** is analogous to both the inlet and exhaust valves in an internal combustion engine.

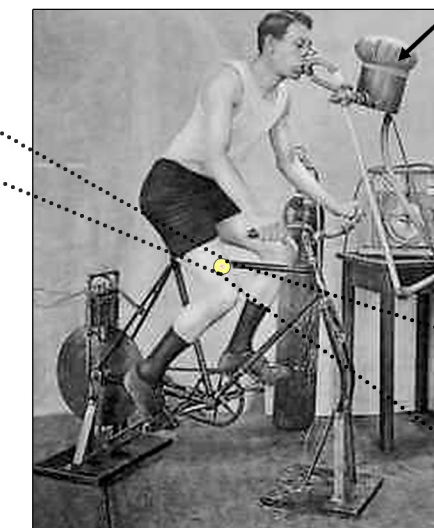


IMPORTANT TO KNOW:

O₂ rich blood is pumped toward muscles and all cells that make up a particular **tissue**, e.g. muscle, organs, brain. Capillaries are microscopic; they are the smallest diameter blood vessels of your cardiovascular system.

Cells exist intermeshed within a **capillary network**, where 'they breathe' (respire), feed, produce waste ('poop'), regenerate, or die... as shown below.

CO₂ from the man's cells exhaled into this vessel.



Only muscle cells possess the ability to contract and produce motion.

You can control the force produced by your muscles. Thus, you influence the way energy from food (**fuel substrate**) is used within the two primary sections of a cell. You can control how food stuffs transform into energy (e.g. motion, heat) and into new products (e.g. CO₂, H₂O).

