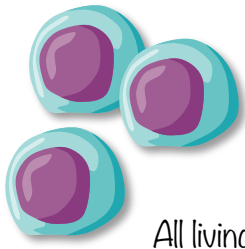


Origin of Cells (HL)



THE CELL THEORY

1

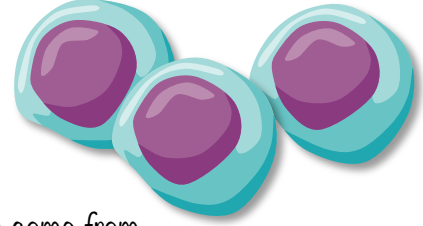
All living organisms are made up of one or more cell.

2

Cells are the smallest unit of life.

3

All cells come from pre-existing cells.



Anything is considered living if they can carry out the functions of life



Viruses are considered **NON-LIVING** as they cannot carry the functions of life

2

The **7** functions of **Life**

HOMEOSTASIS – Maintenance of a constant internal environment.

METABOLISM – The sum of all the chemical reactions that occur within an organism.

RESPONSE – As the environment changes, the organism adapts.

GROWTH – The development of an organism.

REPRODUCTION – The ability to produce offspring.

EXCRETION – The ability to release materials not needed or harmful into the surrounding environment.

NUTRITION – The ability to acquire the energy and materials needed to maintain life.

HOW TO REMEMBER?

HI MR. GREN!

3 In the 1800's -

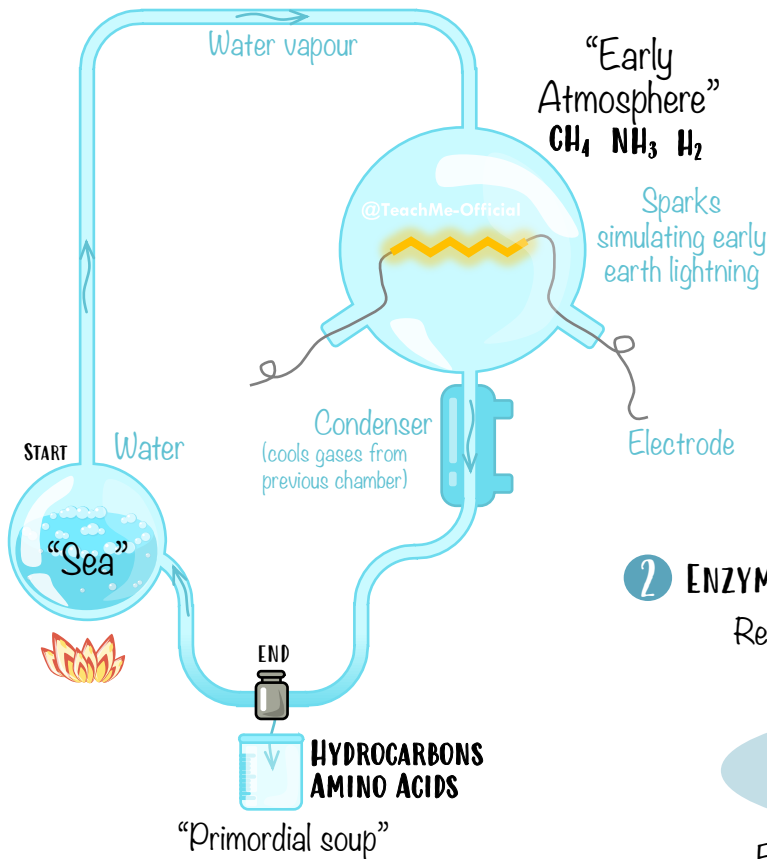


How DID CELLS COME INTO EXISTENCE?

- 1 Organic (carbon) molecules must have existed and been synthesized from abiotic (non-living) molecules. → **MILER-UREY EXPERIMENT**
- 2 Assembly of smaller organic molecules into larger ones must have been possible. Forming polymers. → **ENZYME**
- 3 Membranes must have been formed to enclose all these molecules. → **VESICLE FORMATION**
- 4 Molecules that can replicate must have existed in order for inheritance to occur. → **RNA**

1 MILLER-UREY EXPERIMENT

Designed to simulate the conditions of early Earth's atmosphere and oceans to test the hypothesis that organic molecules, could spontaneously form under those conditions.



CRITIQUES?

- NO IDEA what early earth conditions actually were.

Alternative Hypothesis -> Meteorites

- Water mixed with amino acids do not form proteins.
- Miller-Urey gases are NOT accurate. Rather from volcano.

- No methane or ammonia (miller false)



2 ENZYME

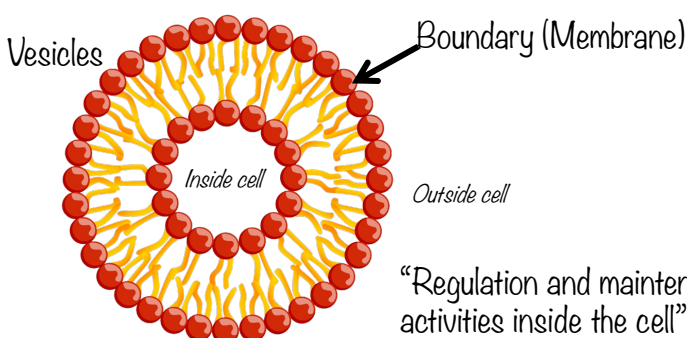
Reactions are super slow so something must have existed to speed it up.



Enzyme like components should have existed. Enzymes are carbon based and so it would have had to be something else. Like, hot sand, clay or rock.

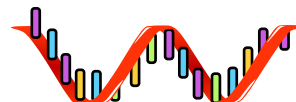
For example, sugar cubes (A) is difficult to dissolve in water (B) to form sugar-water (C) unless helped using heat or mixing with a spoon (the enzyme)

3 VESICLE FORMATION



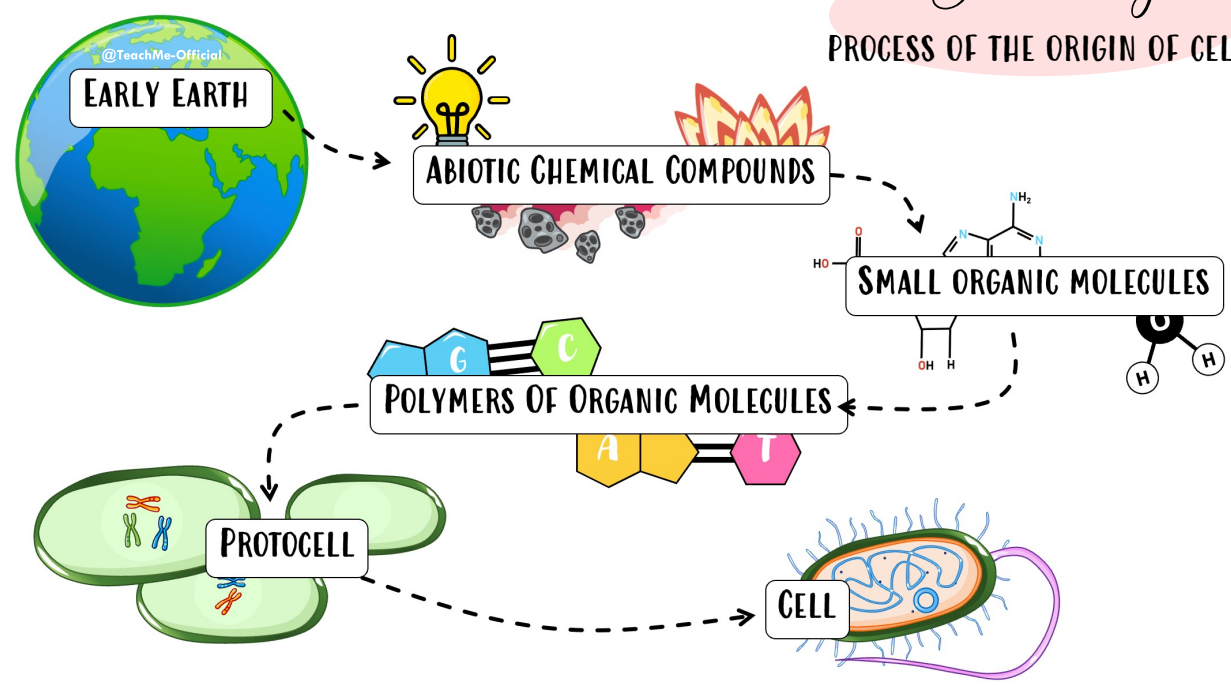
"Regulation and maintenance of activities inside the cell"

4 RNA Must have existed



Summary

PROCESS OF THE ORIGIN OF CELLS



This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.