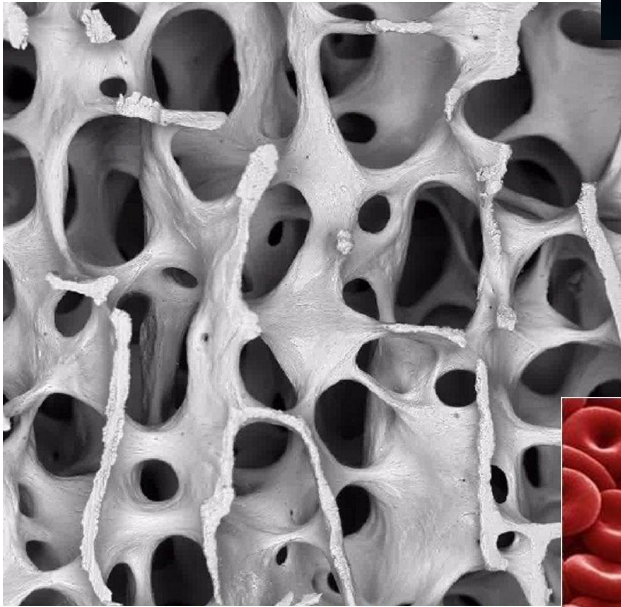


Cells are the **basic structural, functional, and biological unit** of all known living organisms.



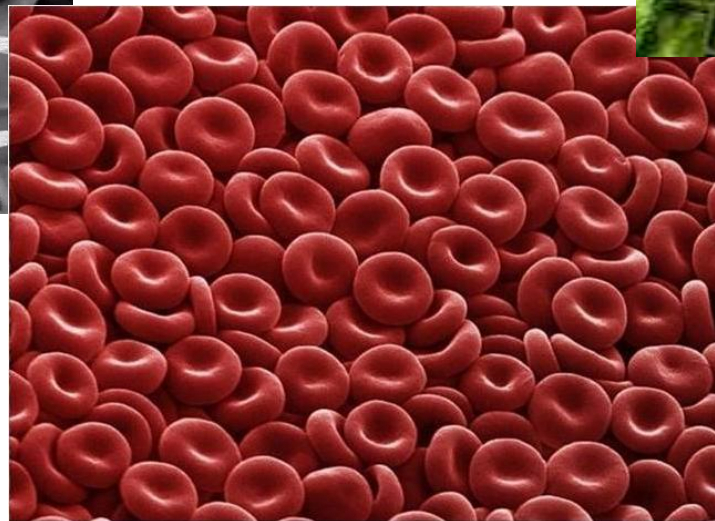
Cells are often called the **"building blocks of life"**.



# Cells

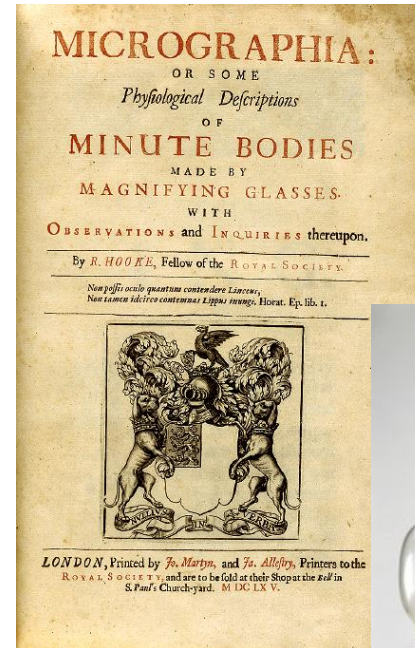
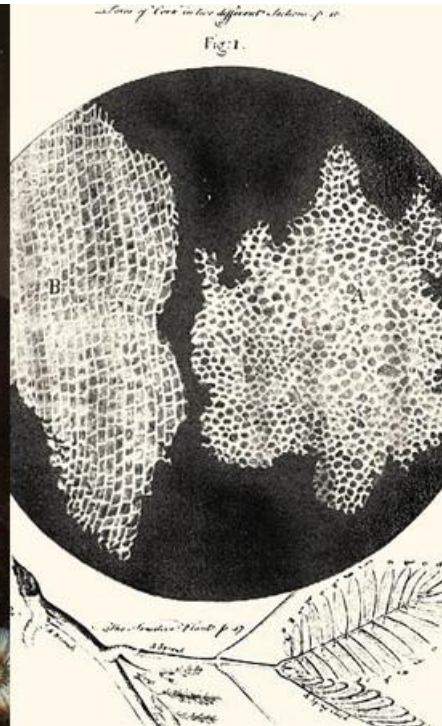


The study of cells is called **cell biology**.



Knowing the **components** of cells and **how cells work** is fundamental to all biological sciences.

# Discovery of Cells



*Micrographia*, published in 1665, was a bestseller!



Hooke's design microscope system →



**Robert Hooke (1665):**

- Observed a **thin slice of cork** (dead plant cells) with a **compound microscope** (20-50x) that he himself designed.
- Described what he observed as "little rooms" (*cells*).



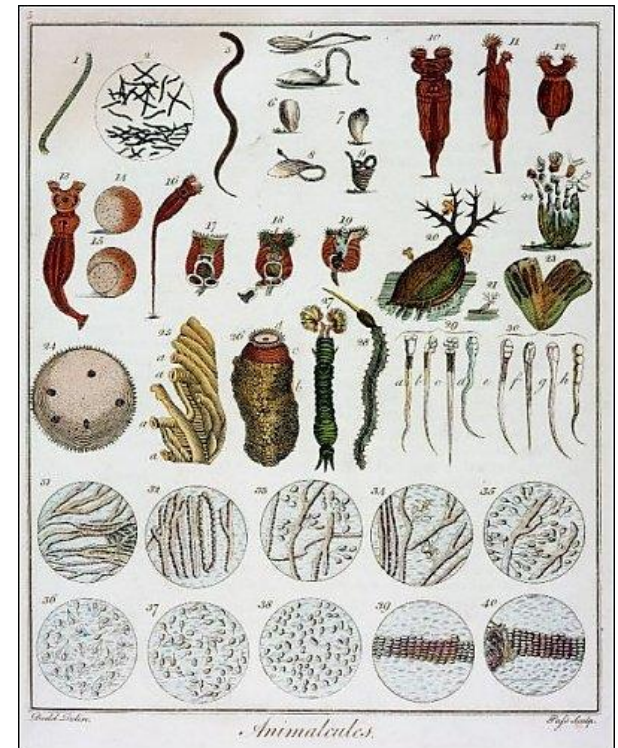
# Discovery of Cells

## Antonie van Leeuwenhoek (1675):

- Discovered a way to create a very small, high-quality glass spheres that became the **lenses of his tiny microscopes**, with the smallest spheres providing the highest (up to 500X) magnification.



- The first person to **observe living cells and describe single-celled organisms** (infusoria in 1674, bacteria in 1676) and the vacuole of a plant cell.
- Commonly known as "the Father of Microbiology".



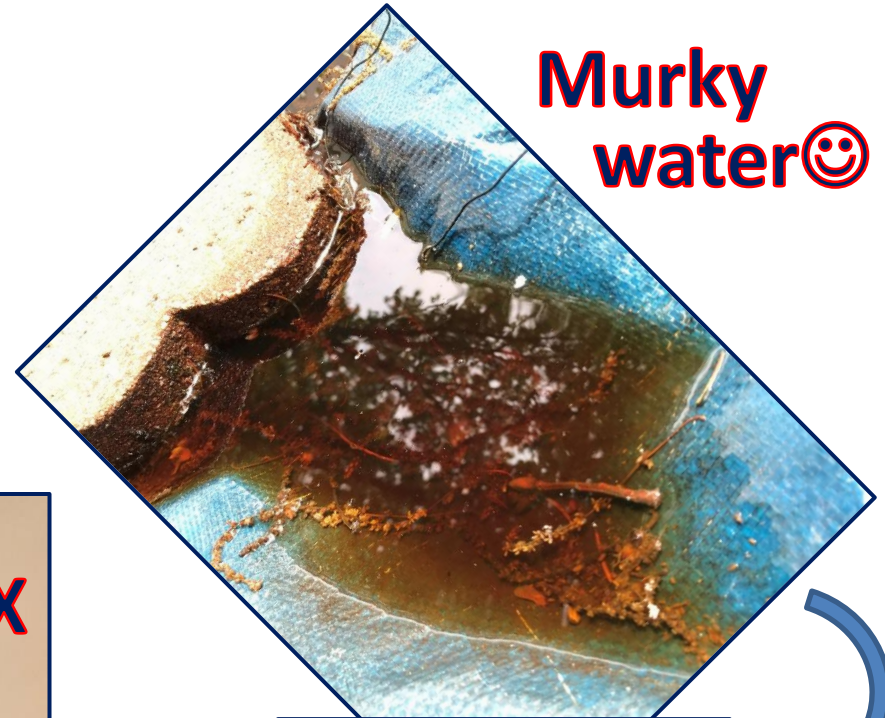
# Observing Cells: Demonstration



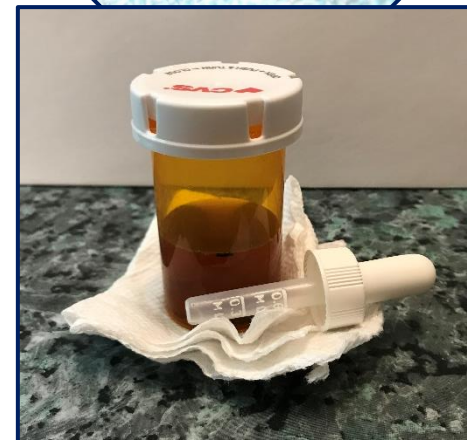
**USB microscope, ~100X**



**A leaf**

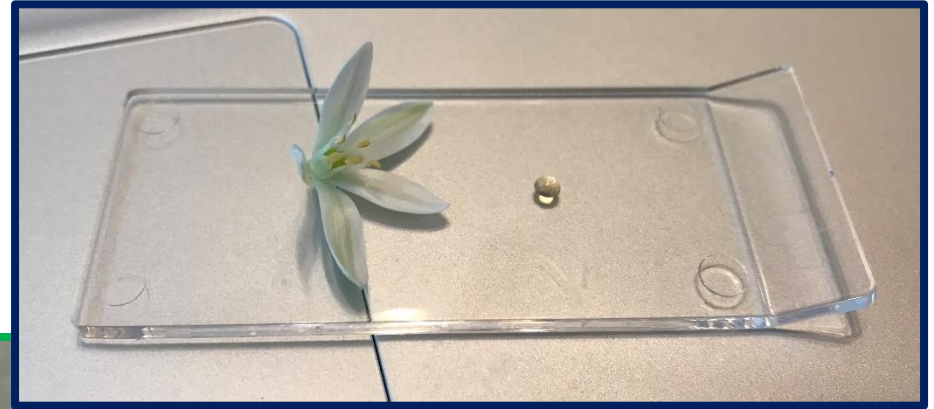


**Murky water 😊**





# What did we observe?



**Plant cells**



**Microorganisms**

# Cell Theory

describes the **properties of cells** as basic units of structure and reproduction in all organisms (*unicellular or multicellular*).



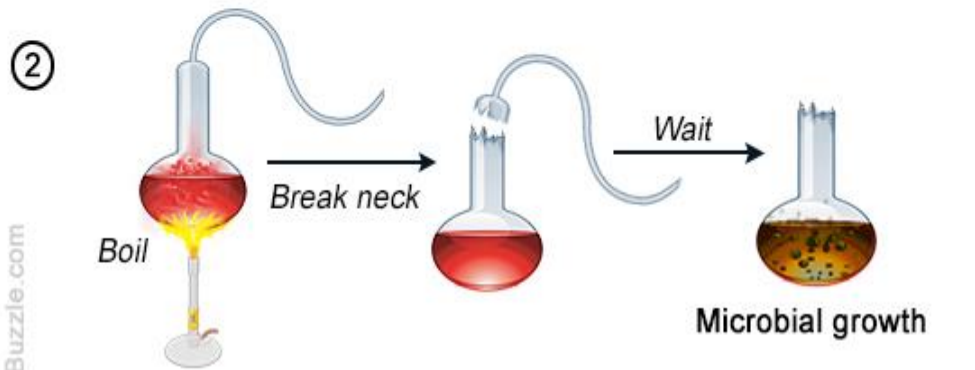
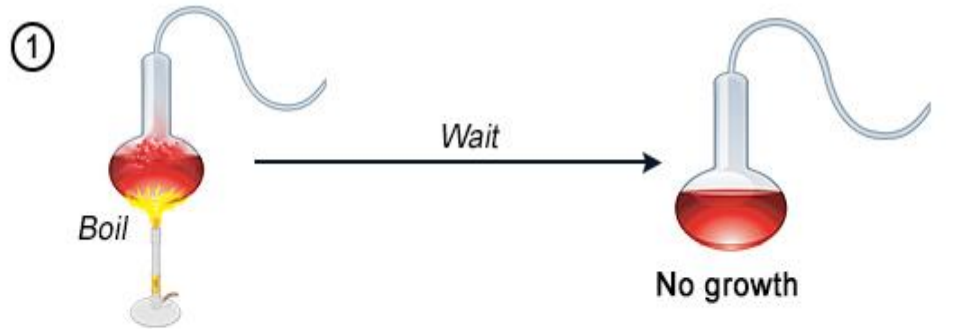
- **Matthias Schleiden (1838):** concluded that **all plants are composed of cells.**
- **Theodor Schwann (1839):** concluded that **all animals are composed of cells.**
- **Rudolph Virchow (1855):** postulated that **cells come only from other cells.**



# Swan-neck flasks experiment, Louis Pasteur 1864



- Demonstrated that **organisms** such as bacteria and fungi **do not spontaneously appear** in sterile, nutrient-rich media, but only **invade them from outside**.



- The theory of Spontaneous Generation (1861): *living things can originate from non-living*.
- Pasteur exposed **boiled broths** to air in vessels that had **open long s-shaped necks** that would not allow dust particles to pass to the growth medium.

- **Nothing grew** in the broths unless the flasks were broken open, thus **disproving the theory of spontaneous generation**.