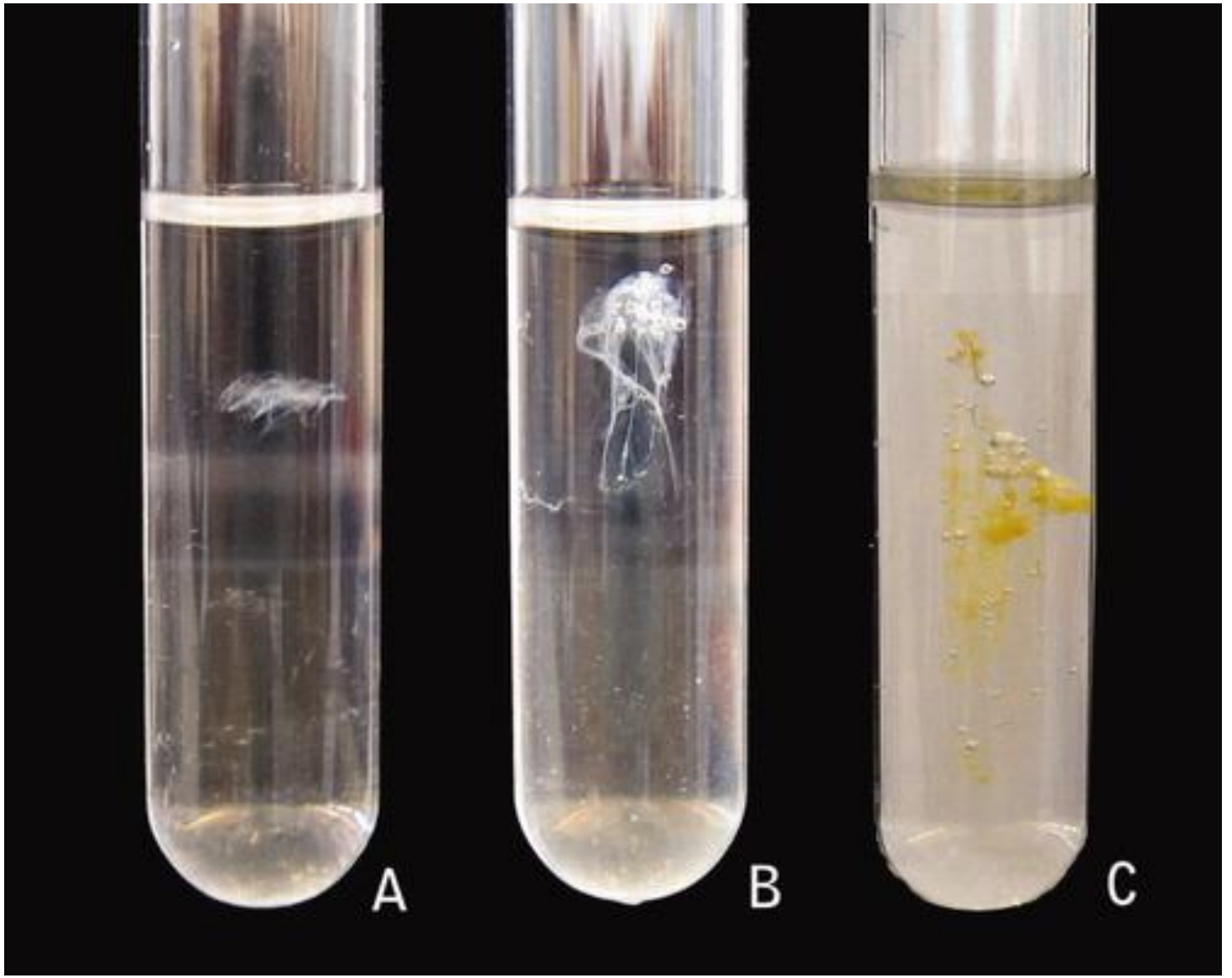
# DNA extraction

# What is DNA extraction?

DNA extraction is also known as DNA isolation is the process of separating/purifying DNA from the sample by using different physical and chemical DNA Isolation methods. The purpose of isolating the DNA is to study individual genes, sequence the entire genome, modify the DNA section, and more.



# Advantages of DNA Extraction

- Disease diagnosis and therapeutic decision.

- Define the unique characteristics of DNA like the shape, the size and function.

- Finding out the molecular basis and cure for various diseases.

- Paternity Tests.

- In criminal investigations, DNA extraction from samples (e.g., hair – skin – blood) is used to determine if a person is a suspect or not

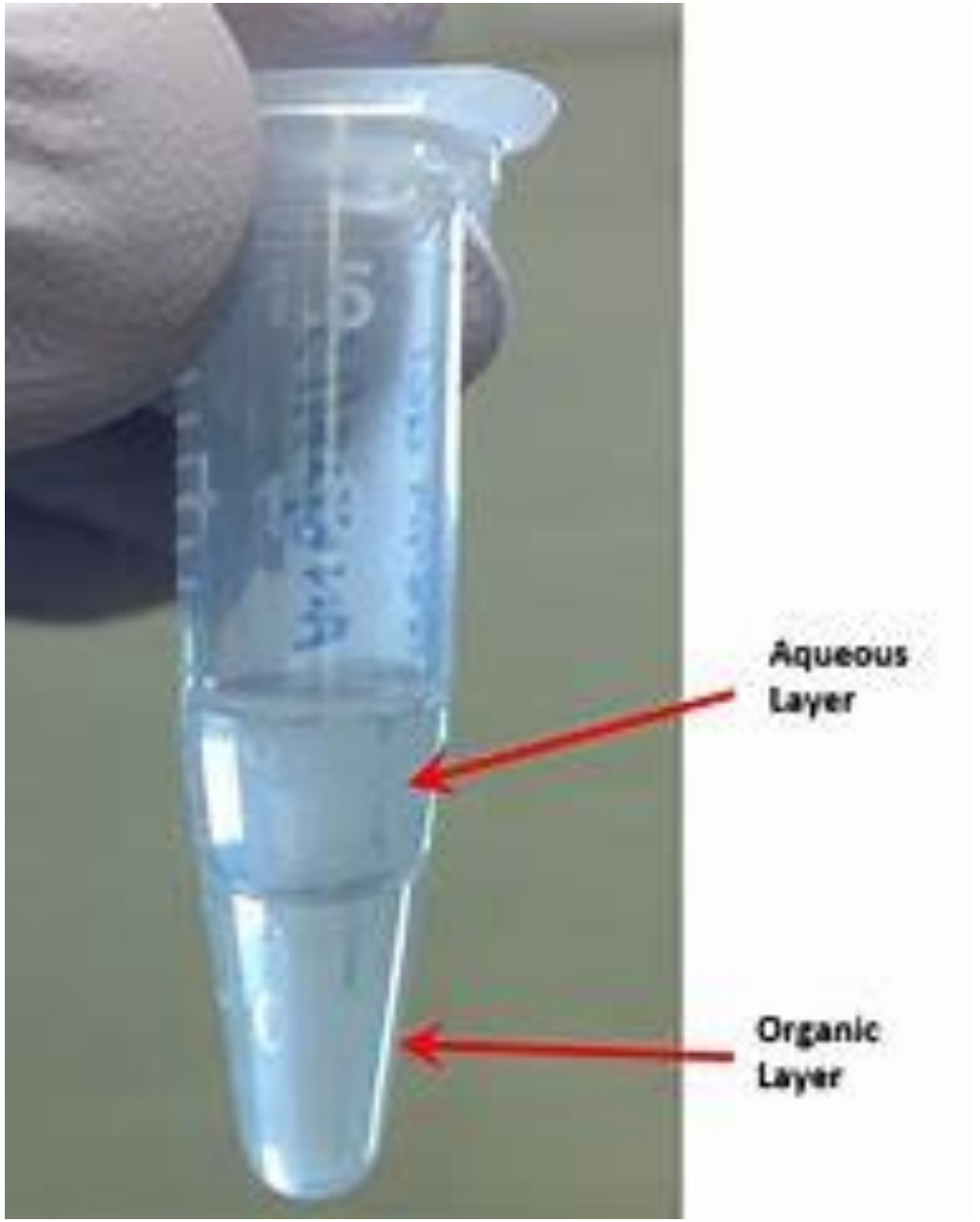
- DNA study also helped in creating many vaccines (e.g., Hepatitis B vaccine), hormones (e.g., growth hormones and insulin), and enzymes.

# Lysis (Step 1):

**The nucleus and cell are broken first for the release of DNA. Initially, mechanical disruption breaks open the cells. This is done by cutting the tissue into small pieces. In addition, small blender, mortar and pestle, and tissue homogenizer can be used too. For softer cell walls, detergents and enzymes like proteinase K are used to free the cellular proteins and DNA.**

## Precipitation (Step 2):

After lysis, DNA has been freed from the nucleus but mixed with cell parts. The precipitation step helps in the separation of DNA from the cellular debris. The negative charges present on the DNA molecules are neutralized by sodium ions, which render them more soluble. In the meantime, their solubility in water decreases. Then, alcohol like isopropanol or ethanol is added, causing the DNA to precipitate out of the aqueous solution as it is insoluble in alcohol.



# Purification (Step 3):

Now, the DNA has been separated from the aqueous phase due to precipitation. It is rinsed with alcohol for the removal of cellular debris and remaining unwanted materials. The purified DNA is redissolved in water for storage and handling with ease.

# THANK YOU