Introduction to Molecular Biology

What is Molecular Biology ?

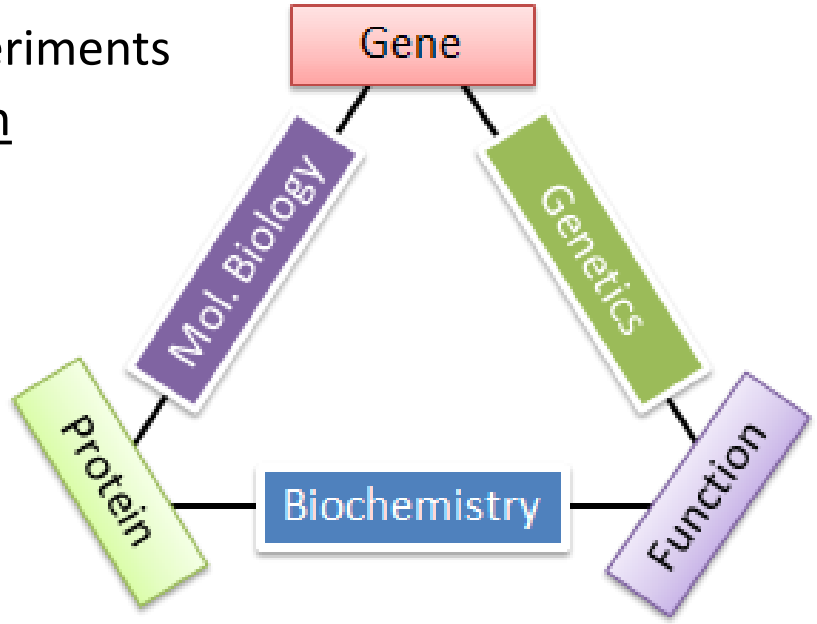
- "**Molecular Biology**" is the study of biology at the molecular level.

- Molecular biology is the study of essential cellular macromolecules, including **DNA, RNA, and proteins**, and the biological pathways between them (replication, transcription, translation).

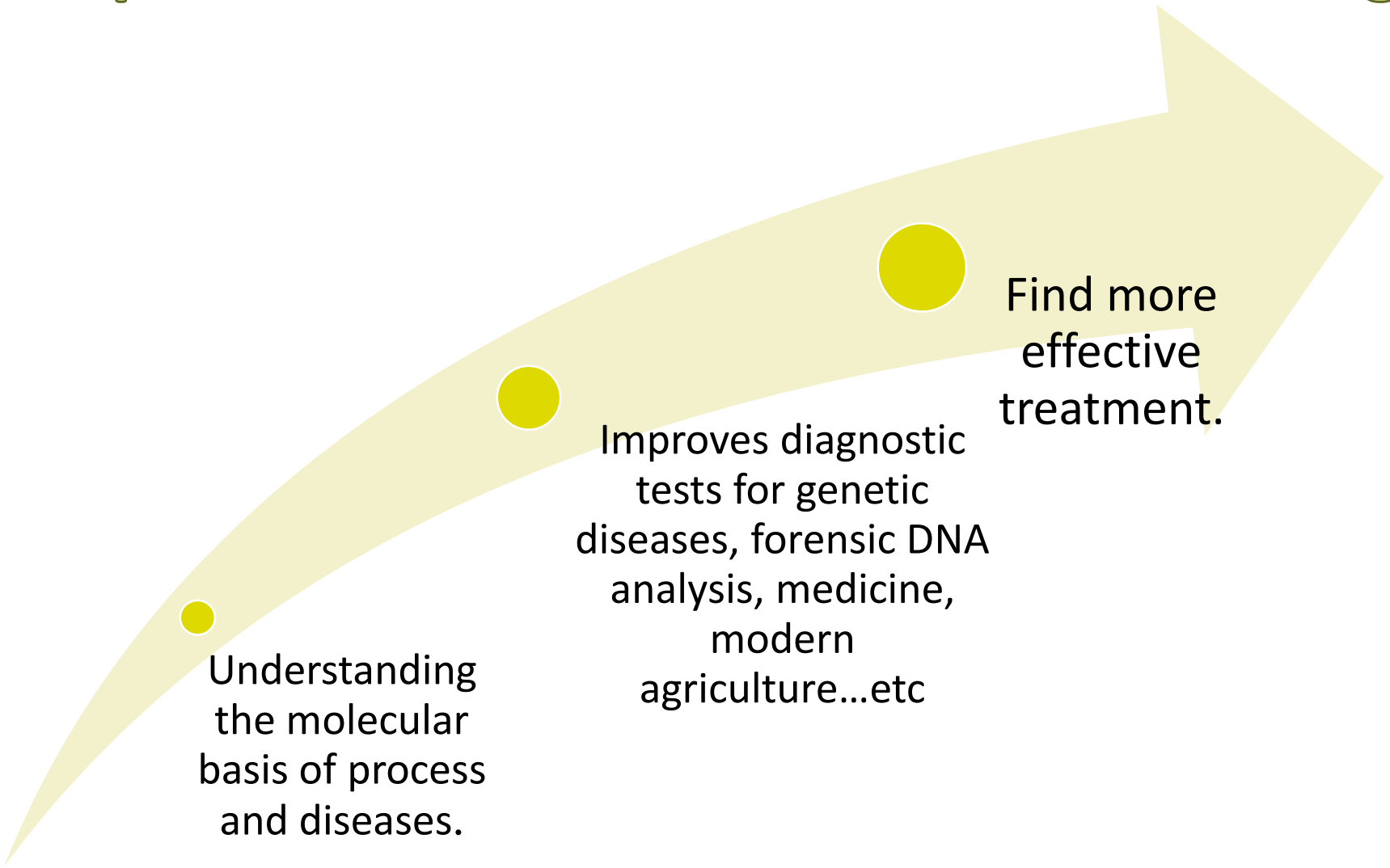
- Researchers in Molecular Biology field, design and perform experiments to gain insight into how these components operate, organization and communicate.

- The techniques used for these studies are **referred to as:**

"Techniques of Molecular Biology".



Why is it important to Understand Molecular Biology?



Things you need to Know :

Basic molecular biology background

Website Sources of information

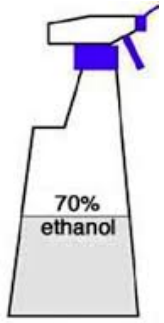
Molecular Biologist

Techniques

Lab safety

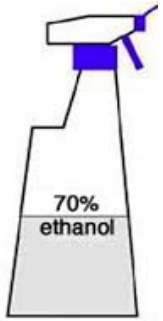
Safety

Before Start Working



While Working

After Working



Types of Hazards:

1. **Biological hazards.**

2. **Chemical hazards:**

-Ethidium bromide (EtBr).

Phenol: cause severe burns

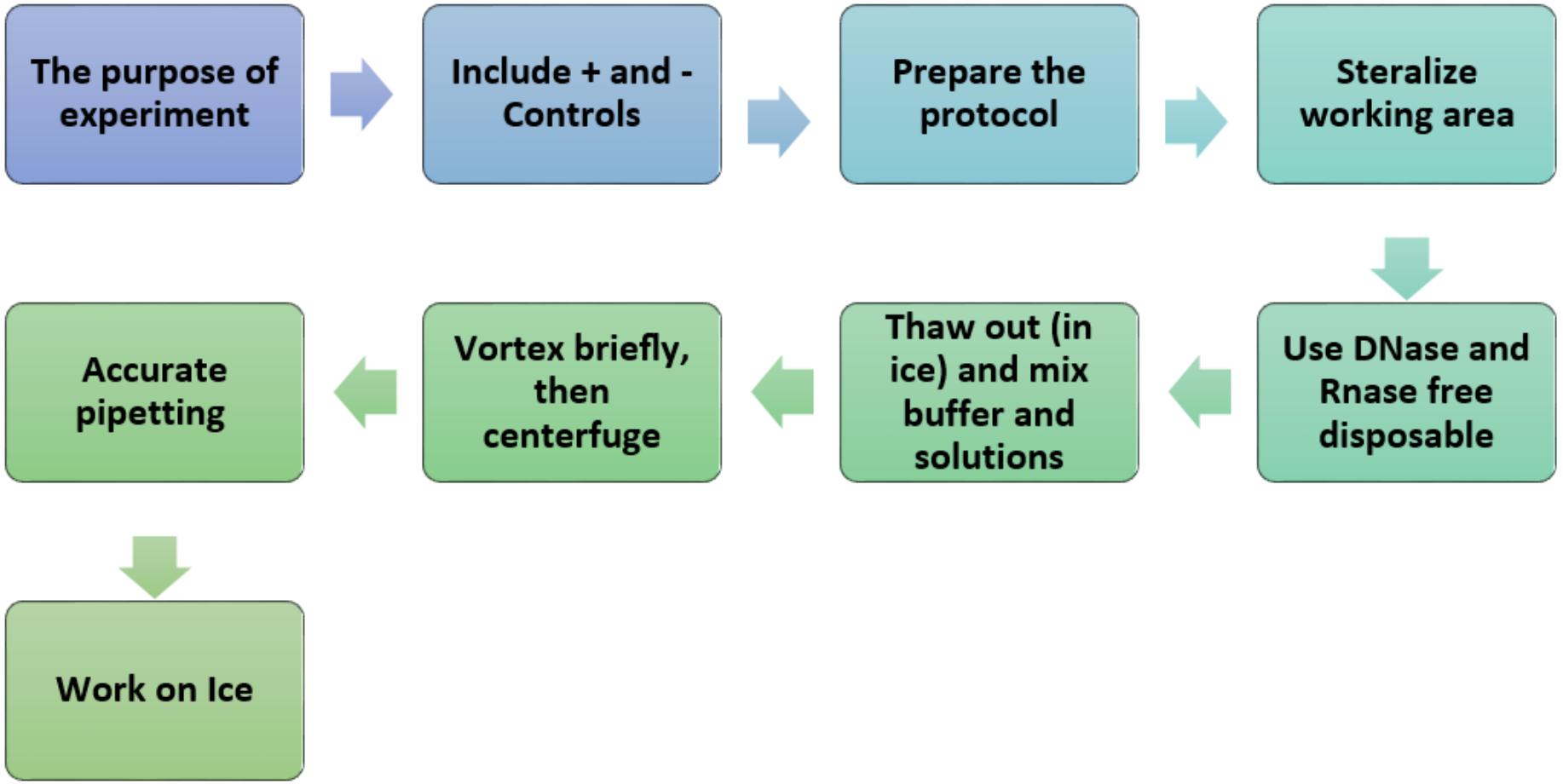
3. **Physical, Electrical and Mechanical hazards:**

-Ultraviolet (UV) light.

-Electricity.

-Centrifugation.

Conducting a Successful Molecular Biology Experiment



Searching the scientific literature:

- The most fundamental skill in bioinformatics is the ability to carry out an **efficient** and **comprehensive** search of the scientific literature to find out what is known about a **specific subject.**

- Sources of information:

→**Books, Articles, Websites.**

- **Some academic research tools:**

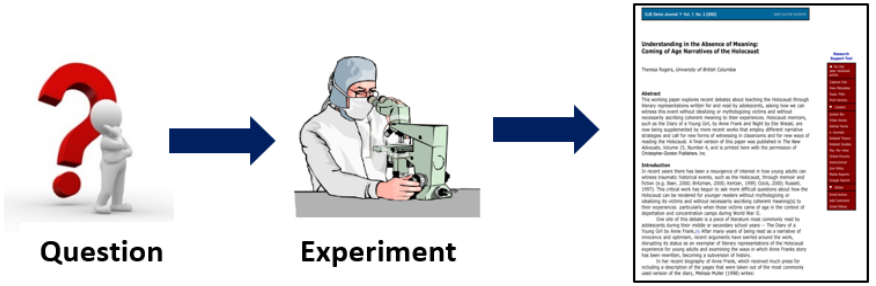
Types of scientific articles:

1. **Primary research article:**

➔ Peer-reviewed.

➔ New research.

➔ Answer a question.



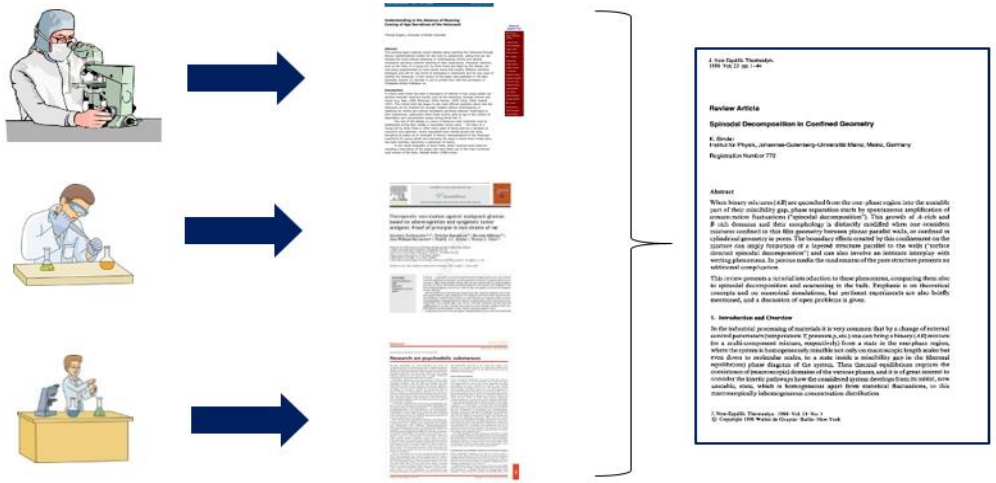
Primary research article that answering Specific question

2. **Review article:**

➔ Peer-reviewed.

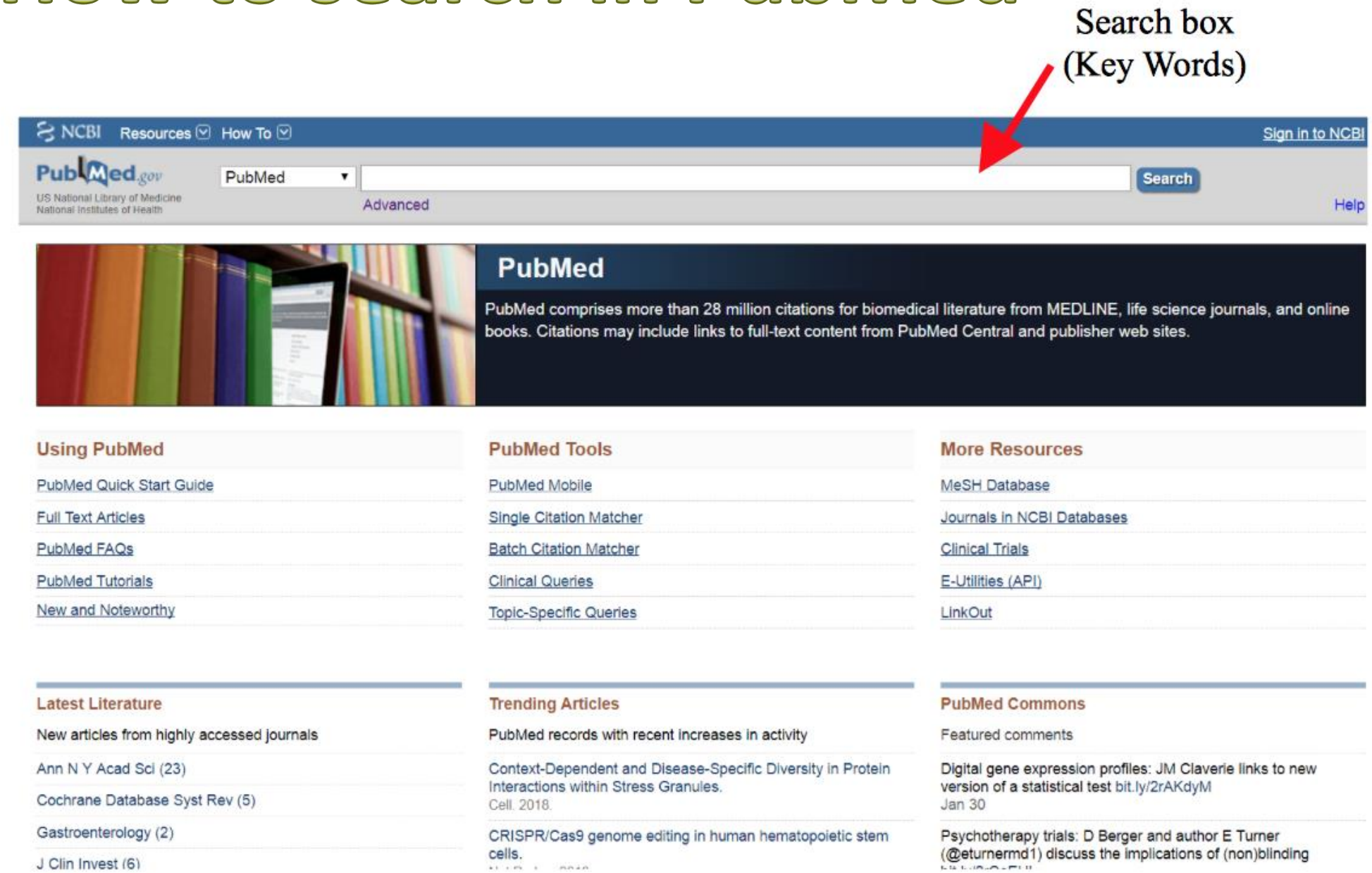
➔No new information.

➔ Good to start with.

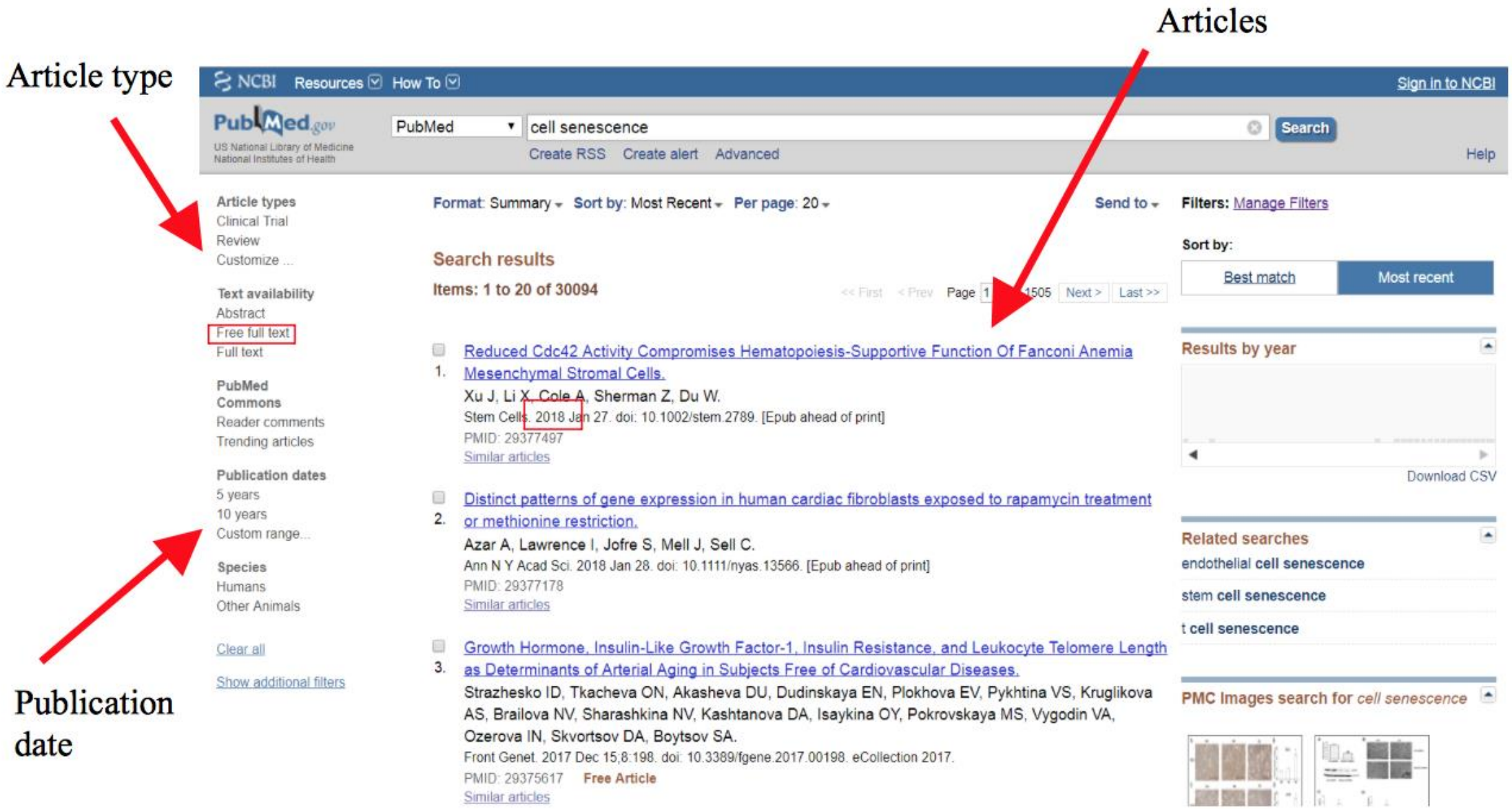


Review article summarize multiple primary research articles

How to search in PubMed



How to search in PubMed



The first step is to isolate DNA or RNA, for these techniques to be carried out. The DNA or RNA can be obtained either from the cells (e.g. plasmid DNA, genomic DNA, mRNA) or can be prepared [complimentary DNA (cDNA)].