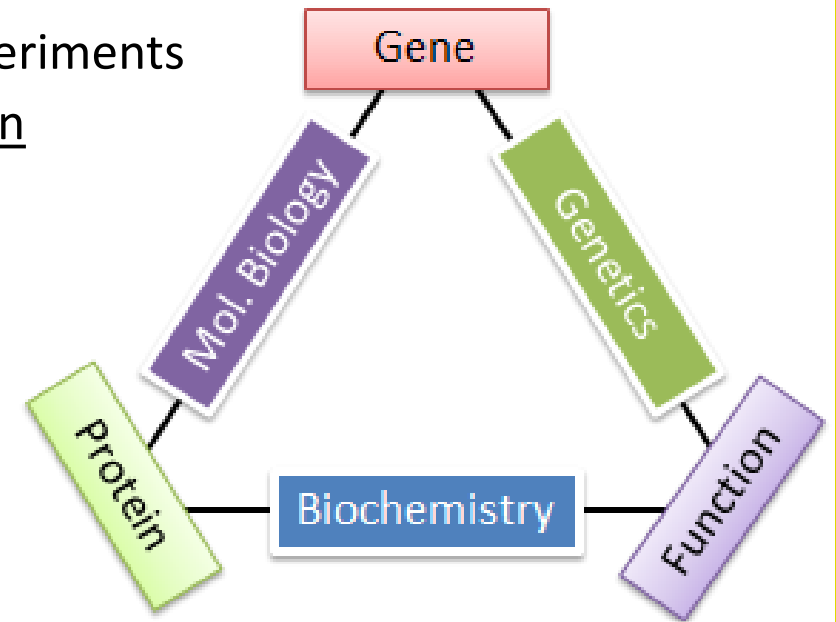




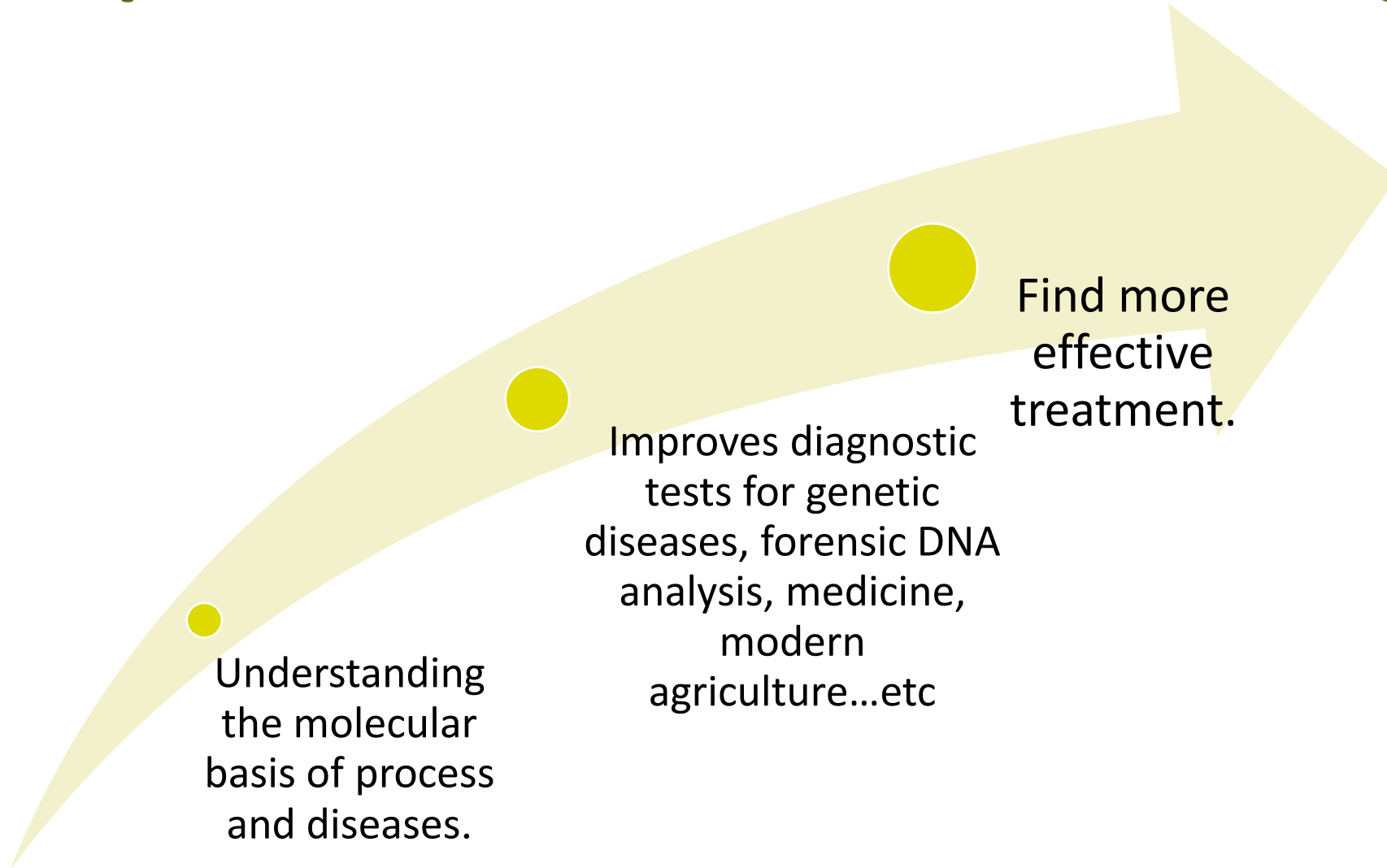
Introduction to Molecular Biology

What is Molecular Biology ?

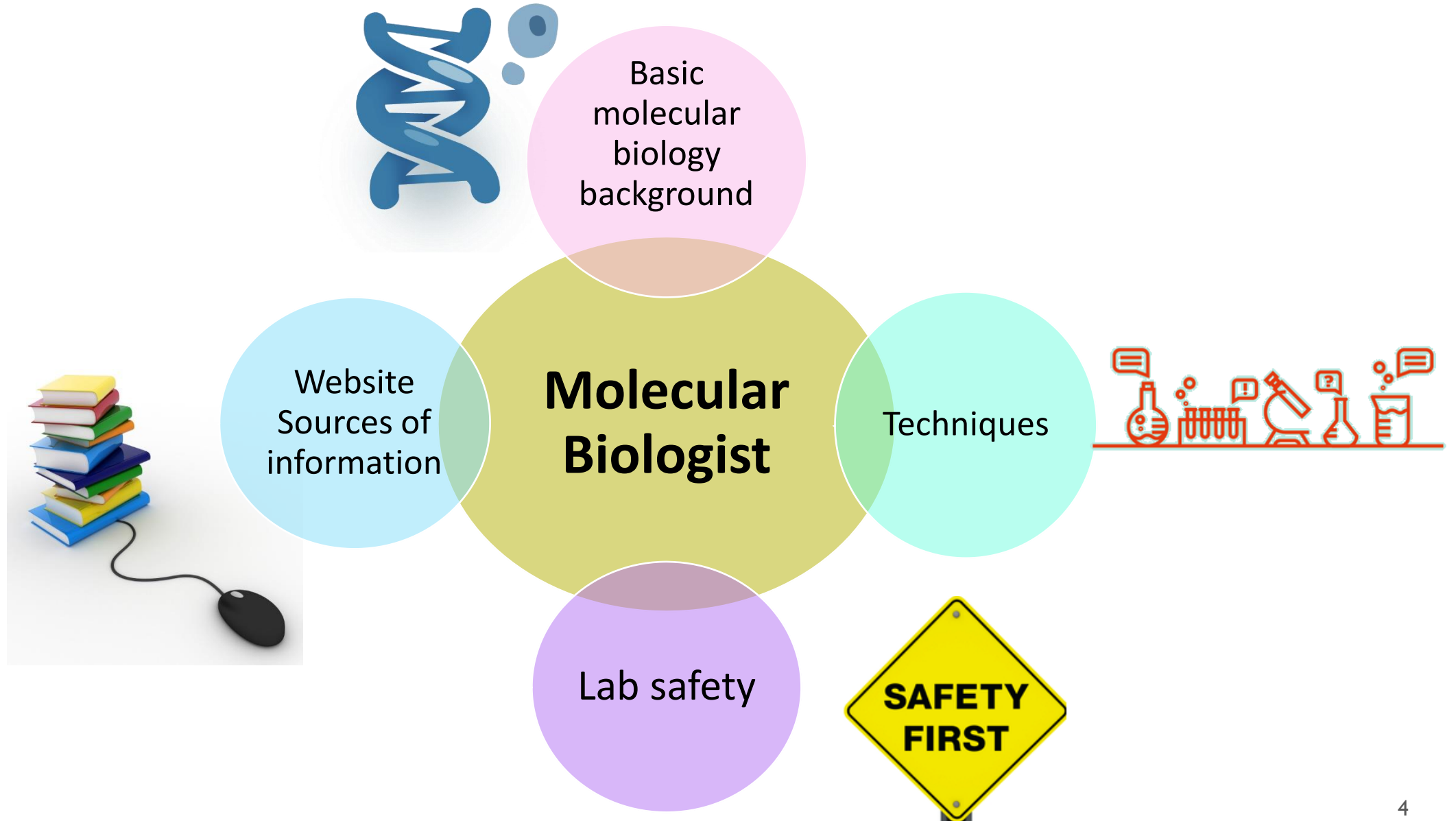
- "Molecular Biology" is the study of **biology** at the **molecular level**.
- Molecular biology is the study of essential cellular macromolecules, including **DNA, RNA, and proteins**, and the biological pathways between them (replication, transcription, translation).
- Researchers in Molecular Biology 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?

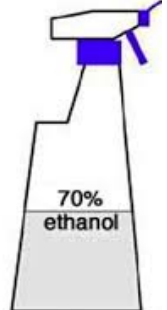


Things you need to Know :



Safety

Before Start Working



While Working



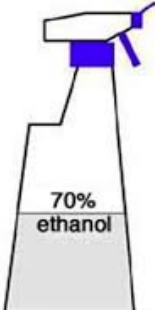
Warning
UV light



Wear eye
protection



After Working



Types of Hazards:

1. Biological hazards.

2. Chemical hazards:

-Ethidium bromide (EtBr).

Phenol: cause severe burns

3. Physical, Electrical and Mechanical hazards:

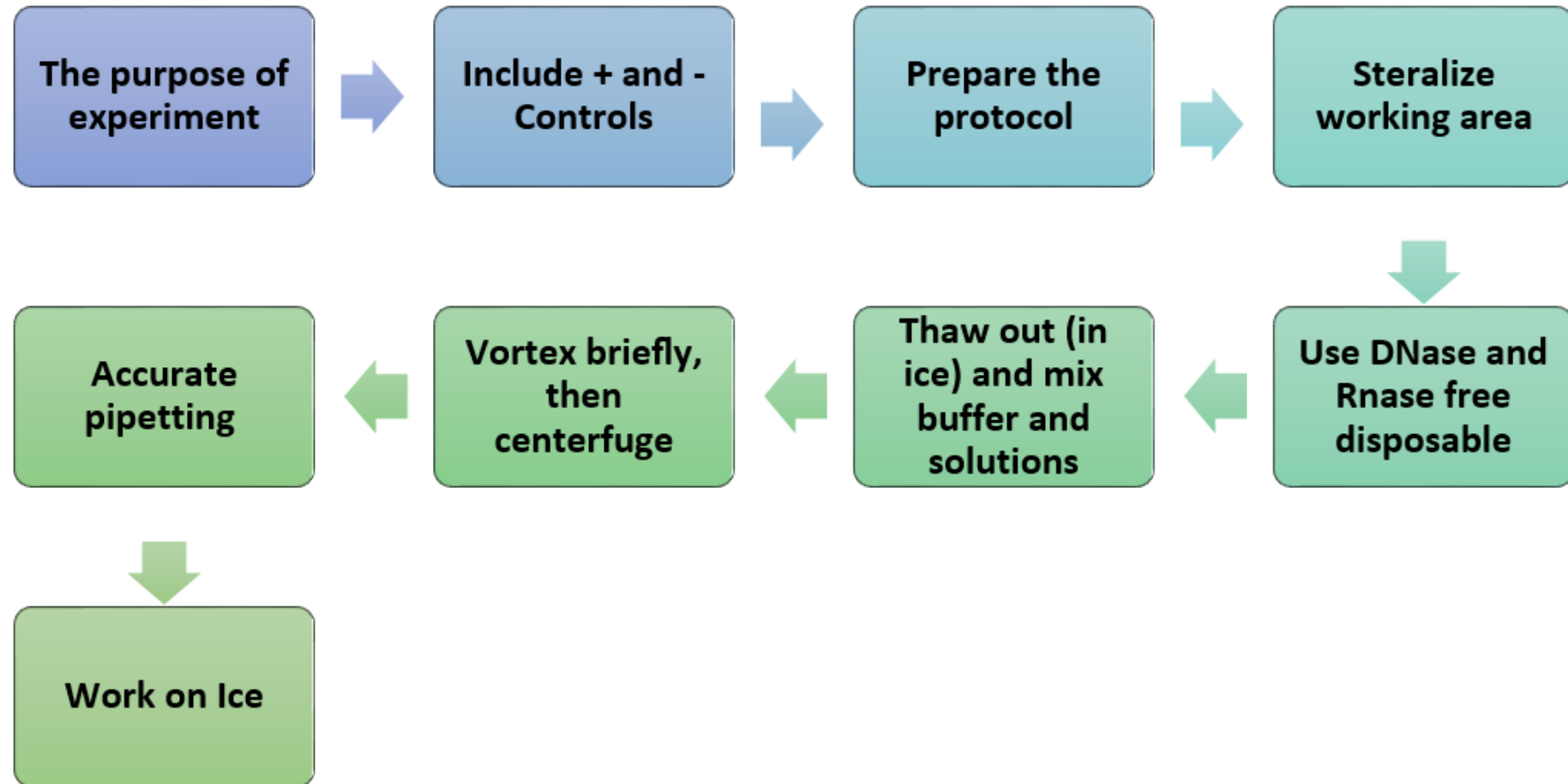
-Ultraviolet (UV) light.

-Electricity.

-Centrifugation.



Conducting a Successful Molecular Biology Experiment



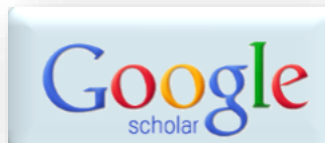
Searching the scientific literature:

- 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.**

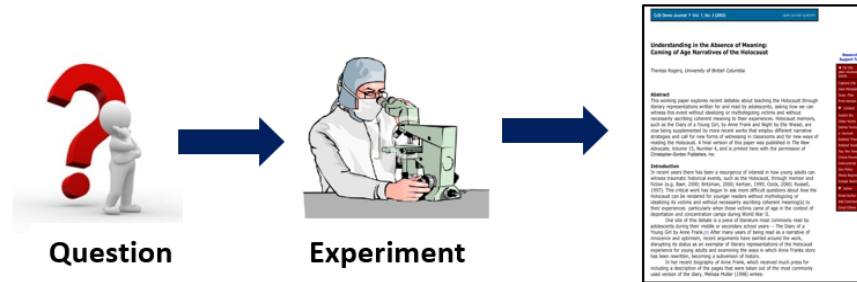
- Some academic research tools:



Types of scientific articles:

1. Primary research article:

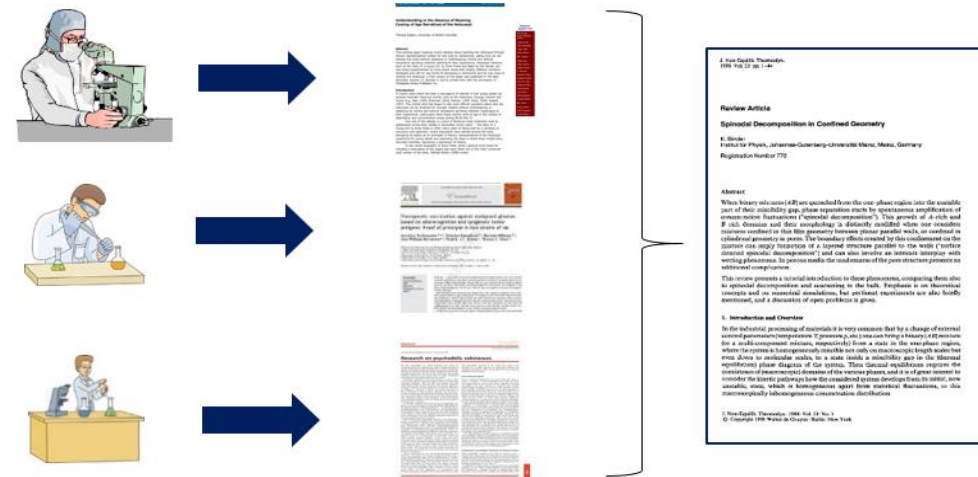
- Peer-reviewed.
- New research.
- Answer a question.



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

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(Key Words)



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Cell. 2018.

[CRISPR/Cas9 genome editing in human hematopoietic stem cells.](#)

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1. [Reduced Cdc42 Activity Compromises Hematopoiesis-Supportive Function Of Fanconi Anemia Mesenchymal Stromal Cells.](#)
Xu J, Li X, Cole A, Sherman Z, Du W. Stem Cells. 2018 Jan 27. doi: 10.1002/stem.2789. [Epub ahead of print] PMID: 29377497 Similar articles

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3. [Growth Hormone, Insulin-Like Growth Factor-1, Insulin Resistance, and Leukocyte Telomere Length as Determinants of Arterial Aging in Subjects Free of Cardiovascular Diseases.](#)
Strazhesko ID, Tkacheva ON, Akasheva DU, Dudinskaya EN, Plokhova EV, Pykhtina VS, Kruglikova AS, Brailova NV, Sharashkina NV, Kashtanova DA, Isaykina OY, Pokrovskaya MS, Vygodin VA, Ozerova IN, Skvortsov DA, Boytsov SA. Front Genet. 2017 Dec 15;8:198. doi: 10.3389/fgene.2017.00198. eCollection 2017. PMID: 29375617 Free Article Similar articles

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Publication date

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)].