



جامعة الاخوة منتوري قسنطينة

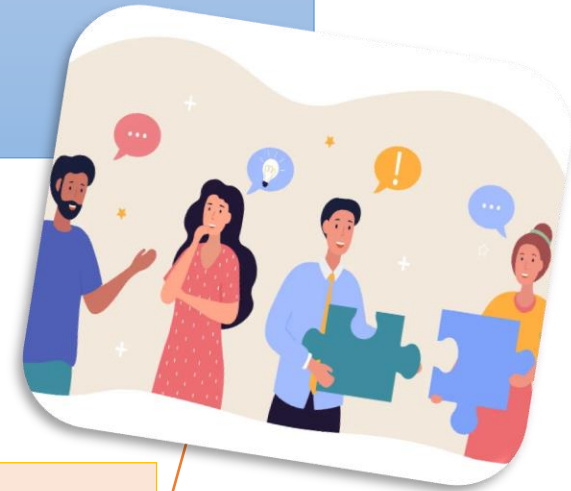
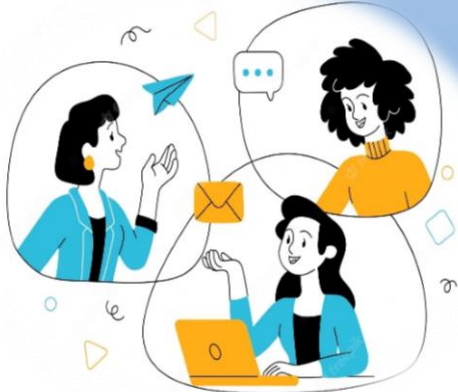
UNIVERSITÉ DES FRÈRES
MENTOURI CONSTANTINE

Democratic and Popular Republic of Algeria
Ministry of Higher Education and Scientific Research

University of Mentouri Brothers - Constantine 1
Faculty of Nature Sciences and Life
Département of Animal Biology
Common Core 2nd Year/S3

U E Méthodologie
Code : UEM 2.1.1
Crédits : 4
Coefficients: 2

Technical communication and expression « TCE » تقنيات التواصل و التعبير



Responsible of the course
Dr. Imène HAMADOU

Targeted public: 2nd year in Biology
Langage: English

Chapter 01: Study and Analyze of a Scientific Text in English

Introduction

Analyzing a scientific text is a critical skill for anyone involved in the fields of science, research, or academia.

Scientific texts are the primary means by which researchers **communicate** their **findings, share knowledge,** and **contribute to the advancement** of their respective fields.

Whether you're a student, scientist, or simply interested in understanding scientific literature, the ability to effectively analyze such texts is priceless.



Student



Scientist

Introduction

The analysis of a scientific text involves a systematic and structured approach to comprehend, evaluate, and get the extract meaningful information from the text.

What are the goal of analzing a scientific text ?

The goal of this analysis is to gain:

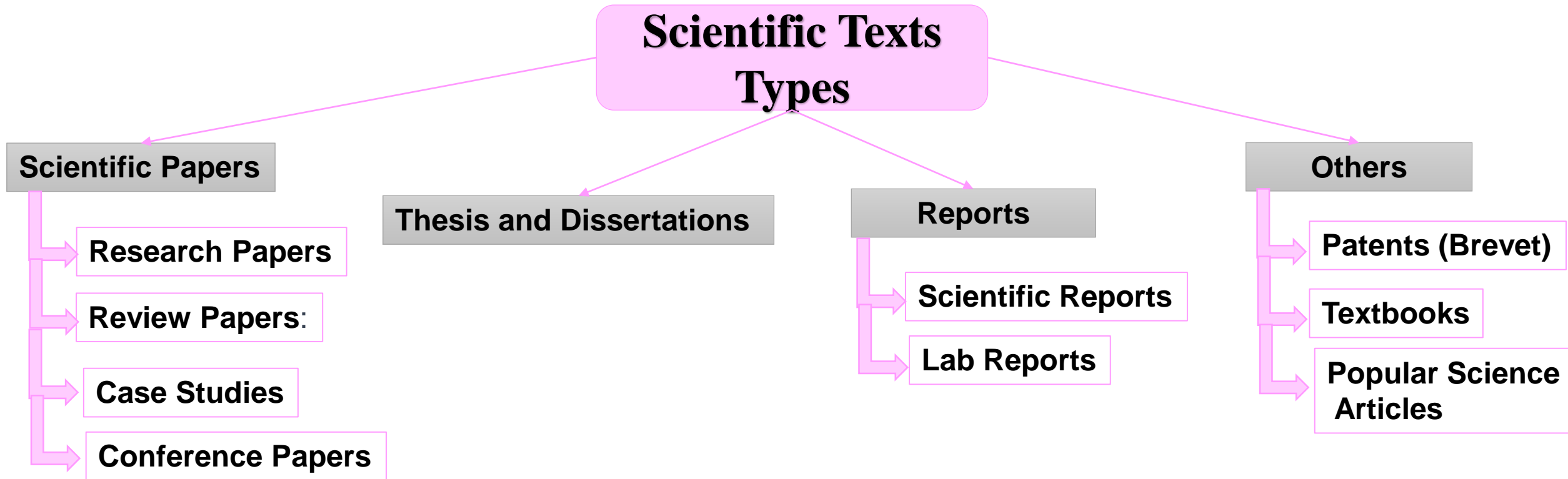
- A comprehensive understanding of the research presented.
- Critically assess its validity and relevance.
- Potentially use the information to support your **own work** or decision-making (such reviewers).



Types of scientific texts

Scientific texts are presented in various forms, each text designed to serve specific purposes in the communication of scientific knowledge.

The common types of scientific texts are cited below.



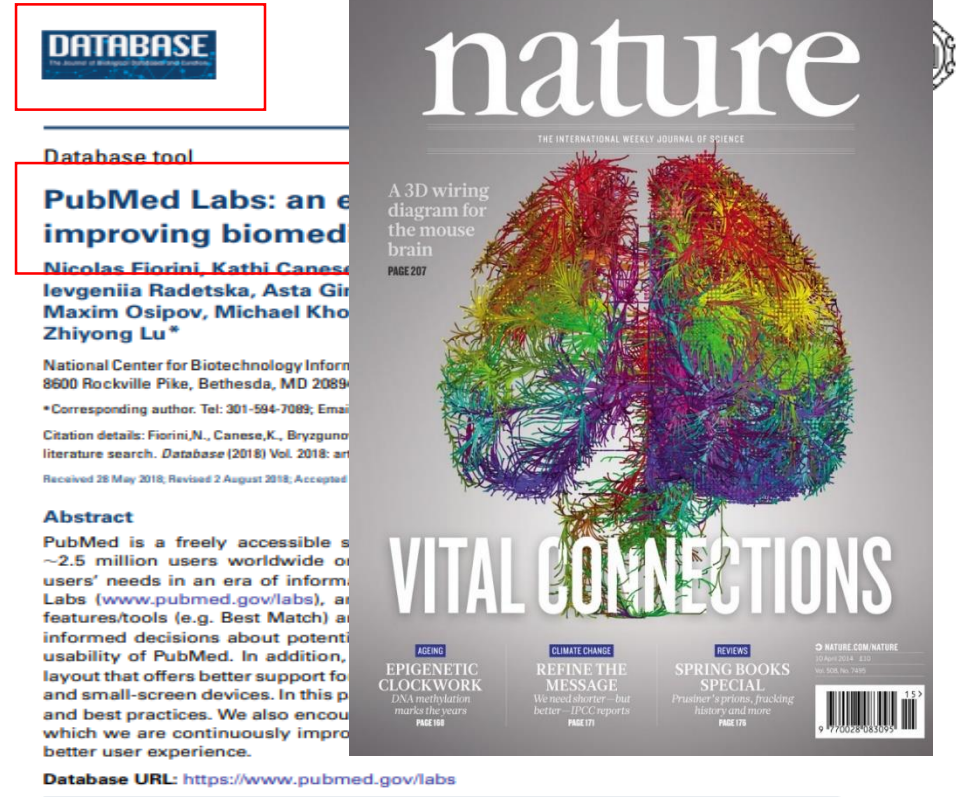
Types of scientific texts

Scientific Papers

Research Papers

- These are the most common and formal scientific texts.
- They report the results of **original research studies**
- They are often published in **scientific journals**.

Example: A research paper on a new drug's efficacy in treating a specific disease.



The image shows two scientific publications. On the left is a PubMed article titled "Database tool" with the main heading "PubMed Labs: an e... improving biomed...". The authors listed are Nicolas Fiorini, Kathi Canese, Ievgeniia Radetska, Asta Gir, Maxim Osipov, Michael Kho, and Zhiyong Lu*. The article is from the National Center for Biotechnology Information, 8600 Rockville Pike, Bethesda, MD 20894. The abstract states: "PubMed is a freely accessible service with ~2.5 million users worldwide. PubMed Labs (www.pubmed.gov/labs), an... features/tools (e.g. Best Match) an... informed decisions about potent... usability of PubMed. In addition, layout that offers better support fo... and small-screen devices. In this p... and best practices. We also encour... which we are continuously impro... better user experience." The Database URL is https://www.pubmed.gov/labs. On the right is the cover of the journal "nature", THE INTERNATIONAL WEEKLY JOURNAL OF SCIENCE. The cover features a 3D wiring diagram of a mouse brain with the title "VITAL CONNECTIONS". Other articles on the cover include "AGEING: EPIGENETIC CLOCKWORK" (DNA methylation marks the years, PAGE 158), "CLIMATE CHANGE: REFINE THE MESSAGE" (We need shorter - but better - IPCC reports, PAGE 17), and "REVIEWS: SPRING BOOKS SPECIAL" (Prustner's priors, tracking history and more, PAGE 178). The cover also includes the journal's website (NATURE.COM/NATURE), ISSN (0028-280X), and a barcode.

Types of scientific texts

Scientific Papers

Review Papers

- These provide comprehensive summaries and analyses of existing research on a specific topic.
- They help researchers and readers stay up-to-date on the current state of knowledge in a field.

Example: A review paper on the role of genetics in cancer development.

REVIEWS

Molecular and evolutionary processes generating variation in gene expression

Mark S. Hill^{1,2}, Pétra Vande Zande^{1,2,3} and Patricia J. Wittkopp^{1,2,3*}

Abstract | Heritable variation in gene expression is common within and between species. This variation arises from mutations that alter the form or function of molecular gene regulatory networks that are then filtered by natural selection. High-throughput methods for introducing mutations and characterizing their *cis*- and *trans*-regulatory effects on gene expression (particularly, transcription) are revealing how different molecular mechanisms generate regulatory variation, and studies comparing these mutational effects with variation seen in the wild are teasing apart the role of neutral and non-neutral evolutionary processes. This integration of molecular and evolutionary biology allows us to understand how the variation in gene expression we see today came to be and to predict how it is most likely to evolve in the future.

Genetic drift
Variation in allele frequencies caused by random sampling of individuals.

The regulation of gene expression is a critical step in translating genotypes into phenotypes. Variation in this regulation is common within and between species¹ and contributes to trait diversity. For example, changes in the regulation of gene expression have been shown to contribute to divergent pigmentation in plants and animals^{2,3}, polymorphic body size in mice⁴, the sporulation rate in domesticated yeast⁵ and many other morphological, physiological and behavioural traits^{6,7}, including disease states in humans⁸. Understanding how regulatory variation arises and evolves is thus critical for understanding many aspects of biology.

Genetic variation that affects the activity of regulatory networks underlies variation in gene expression. These networks include interactions among proteins, RNAs and DNA sequences. Transcription factor proteins and DNA sequences such as enhancers and promoters are most often considered to define the structure of gene regulatory networks^{9,10}, but protein-protein interactions, signalling pathways and even metabolic states can also have an impact on their activity¹¹. Mutations that alter any of these elements can give rise to

variation in gene expression. Such mutations can be classified as either *cis*- or *trans*-acting¹²; *cis*-acting mutations alter expression of a gene located on the same chromosome and tend to be located close to the affected gene, whereas *trans*-regulatory mutations have effects on gene expression that are mediated by diffusible molecules (such as RNAs and proteins) and can be located anywhere in the genome. Both types of mutation contribute to variation in gene expression, but differences in their molecular mechanisms suggest that they might contribute

trans-acting variants have now been performed for diverse plant, animal and microbial species¹³. As with all traits, this variation reflects the introduction of new genetic variants by mutation, the filtering of these variants by natural selection and the chance survival of variants mediated by genetic drift. The extent to which each of these processes shapes the variation we see in wild populations, however, remains difficult to discern. For example, if one gene shows more variation in its expression than another, this might be because expression of the first gene is under less selective constraint or because a greater fraction of new mutations alters its expression (among other possibilities). Studies investigating the role of selection in shaping regulatory variation have, thus far, relied heavily on assumptions about the effects of new mutations because few empirical data were available^{14,15}. However, this knowledge gap is beginning to close as recent advances in DNA synthesis, genome editing and high-throughput expression analysis allow regulatory mutations to be generated and characterized on a large scale¹⁶.

Here, we examine our current understanding of the molecular and evolutionary processes generating variation in gene expression. We focus on variation in RNA expression because this is where most data are available, quantifying variation in protein expression levels remains much more technically challenging. We begin by briefly reviewing studies describing the relative contributions of *cis*- and *trans*-regulatory variation to variation in gene expression. We then discuss the molecular sources of this regulatory variation, including studies that describe the effects of mutations in these sequences

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*These authors contributed equally. Mark S. Hill, Pétra Vande Zande and Patricia J. Wittkopp.

Types of scientific texts

Thesis and Dissertations

- These are comprehensive research documents submitted by graduate students to earn **advanced degrees**.
- They include **original research, literature reviews, methodologies, and conclusions**.

Example: A Ph.D. dissertation on environmental factors affecting a specific plant species.



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Département des sciences de la nature et de la vie
Filière : Sciences biologiques

MÉMOIRE DE MASTER

Spécialité : Biochimie Appliquée
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Présenté et soutenu par :
Rofaida MESSALEM Et Fatima Zahra MENACER

Le: mercredi 30 juin 2021

**Mutation des gènes de réparation
(RAD51) et cancer du sein à propos
des cas cliniques de la population
Algérienne.**

Jury:

Mme. Hayat AOURAGH	MAA	Mohamed kheider	Président
Mlle. Hanane ACHOUR	MAA	Mohamed Kheider	Rapporteur
Mme. Fatima BENABDALLAH	MAA	Mohamed Kheider	Examineur

Année universitaire : 2020-2021

Types of scientific texts

Reports

Lab reports

- These are documents generated by students or researchers after conducting experiments in a laboratory.
- They include details about the experiment, methods, results, and conclusions.

Example: A lab report on a microbiology experiment testing the effectiveness of different disinfectants.

Lab Report

Scientist Name: _____

Name of Experiment _____

Materials:

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Directions:

What Happened?

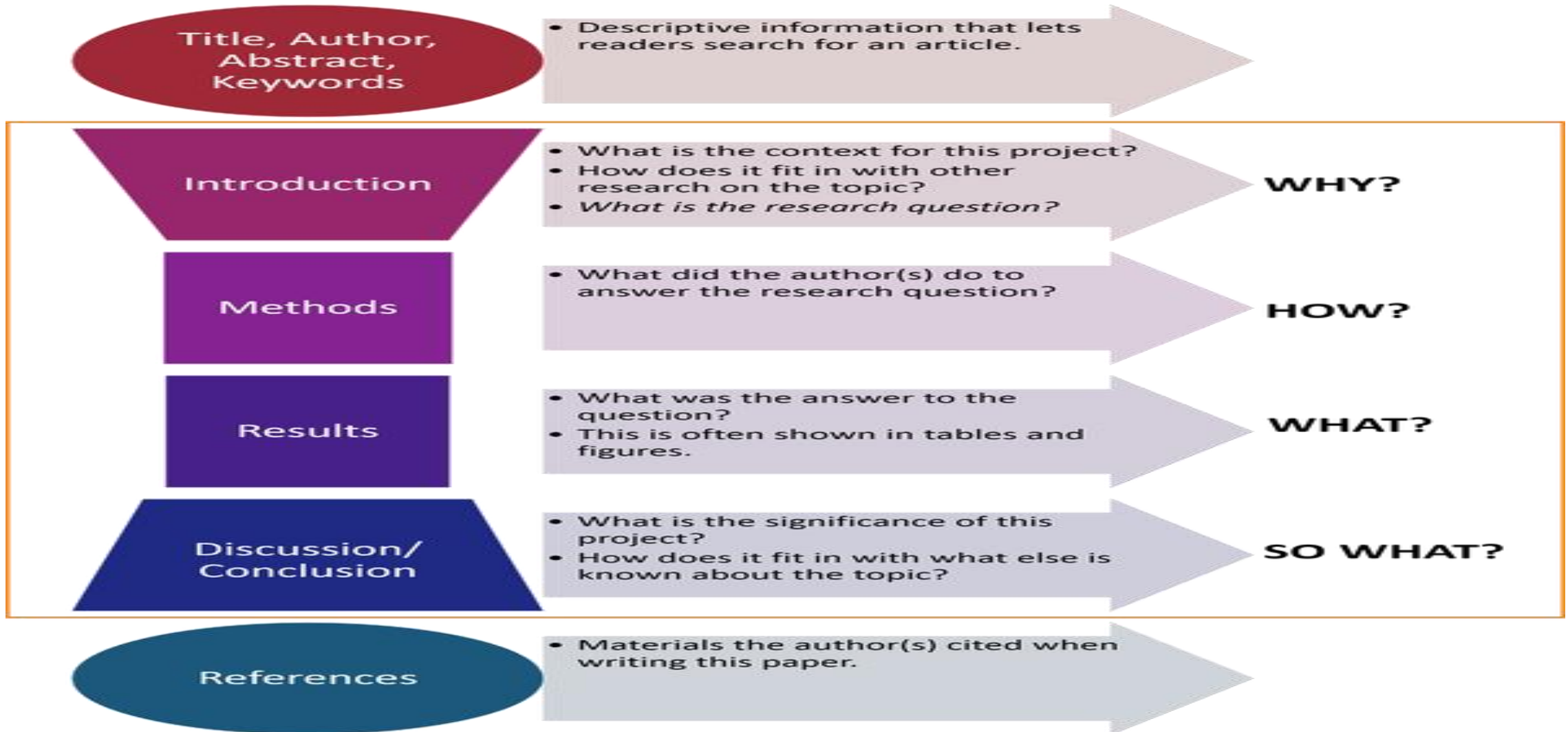
Structuration of scientific texts

- The general structure of a scientific text, such as a research paper, typically follows a standardized format designed to convey information clearly and logically.
- The text should be clearly structured, subdivided into sections and paragraphs. We must strive to ensure that:
 - a. Each section was an independent exploration on a specific part of the problem.
 - b. Each component was described in the text, and the text was holistic and not fragmented.
- The structure of the scientific text consists of introduction, body and conclusion, it follow the IMRaD structuration (Introduction, Methods, Results, and Discussion).

The structuration of a scientific text are crucial for

- ensuring clarity,
- organization,
- effective communication of research findings (results/discoveries)

Structuration of scientific texts



General rules of scientific text analysis

- ❑ **Understanding the Structure:** Scientific texts typically follow a standardized structure, which may include sections like Introduction, Methods, Results, Discussion, and Conclusion. Recognizing this structure helps you navigate the paper more effectively.
- ❑ **Identifying the Research Question:** Determine the primary research question or hypothesis the study aims to address. This provides context for the entire paper.

General rules of scientific text analysis

- ❑ **Evaluating the Methods:** Assess the research methods used in the study. Understand how data was collected, experiments were conducted, and analyses were performed. This helps you estimate the reliability and validity of the results.
- ❑ **Interpreting the Results:** Analyze the data presented in tables, figures, graphs, and narrative descriptions. Look for patterns, trends, and statistical significance. Consider whether the results align with the research question.
- ❑ **Assessing the Discussion:** Examine the authors' interpretation of the results. Are the conclusions supported by the data? Are there limitations or alternative explanations?

General rules of scientific text analysis

- ❑ **Critical Thinking:** Apply critical thinking skills to identify potential biases, errors, or limitations in the study. Consider the broader implications of the research within the field.
- ❑ **Citing and Referencing:** Pay attention to references cited in the text. These can lead you to related studies and sources for further exploration.
- ❑ **Taking Notes:** Make notes as you read to capture key points, interesting findings, questions, and your own insights.
- ❑ **Discussing and Sharing:** Engage in discussions with peers, mentors, or colleagues about the paper to gain different perspectives and insights.

General rules of scientific text analysis

Key questions!

- ✓ Are the research methods used sound?
- ✓ Are the results presented clearly and accurately?
- ✓ Are the conclusions supported by the data?
- ✓ Are there any potential biases or limitations in the study?
- ✓ What are the implications of the findings for future research or practice?