



**University Echahid Hamma Lakhdar - El Oued**  
**Faculty of Life and Nature Sciences**  
**Department of Cellular and Molecular biology**



**Level: 3<sup>rd</sup> year in Applied Biochemistry / Toxicology**

**Subject: Communication and Expression Techniques**

# *Scientific Writing*



**University year: 2021/2022**

**By: MEHELLOU Z.**

# ***Introduction***

**Communication and Expression Techniques**

**Presented by: MEHELLOU Z.**

**Transversal Teaching Unit**

**Coefficient: 1**

**Credit: 1**

## ***Work plan***

**Principles and Characteristics of Scientific Writing**

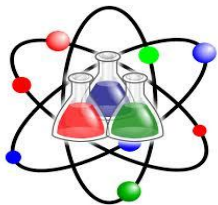
**Analysis of Scientific Articles**

**Examples**



# *Principles of Scientific Writing*

Scientific writing follows **certain conventions** related to format, citation, design, voice, tense, concision and organization that may differ from writing in other contexts. The best way to learn these conventions is to **read representative samples** within each discipline. Although every audience –be it peer-reviewed journal, professional organization, or academic search committee– has unique expectations and demands, the following **10 advices** applies to most scientific writing:



# *Principles of Scientific Writing*

**1. Present and organize information in the correct format**

**2. Use the correct citation style**

**3. Use direct quotations sparingly**

**4. Use tables, graphs and other visuals to illustrate information**

**5. Write in active voice unless passive voice is necessary**

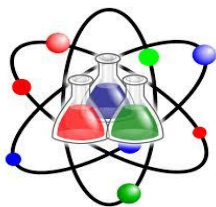
**6. Write in the proper tense**

**7. Eliminating Redundancy**

**8. Make sentences simple and active**

**9. Build arguments by connecting sentences**

**10. Avoid subject-verb separation whenever possible**



# *Principles of Scientific Writing*

## 1. Present and organize information in the correct format

Most article manuscripts and theses follow the **IMRaD** format:

- Introduction, Methodology, Results and Discussion
- Some documents contain a Literature Review after the Introduction

## 2. Use the correct citation style

Though many journals maintain modified systems of citation and reference, most scientific writing follows one of three citation styles:

- AMA (American Medical Association)
- **APA** (*American Psychological Association*)
- CSE (Council of Science Editors)



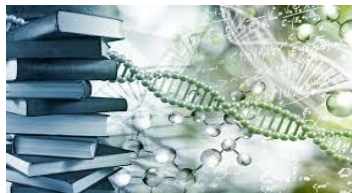
# *Principles of Scientific Writing*

## **3. Use direct quotations sparingly**

- Paraphrasing demonstrates comprehension of source material and the ability to concisely synthesize it with one's own ideas
- Direct quotations should only be used when meaning might be lost by paraphrasing the original author's words

## **4. Use tables, graphs and other visuals to illustrate information**

Visual aids can sometimes illustrate information more clearly than sentences and paragraphs



# *Principles of Scientific Writing*

## 5. Write in active voice unless passive voice is necessary

Active voice is **generally** more **effective** in scientific writing

- It is direct and clear
- It demonstrates agency

Passive voice is **sometimes** preferable

- When the action itself is more important than who performed the action
- In methodology sections, for instance, passive voice removes the agent and makes the experimental process the subject of the sentence

In the following example, active voice is preferable because it may be important to know who drew or what determined the conclusion:

Passive Voice: It was concluded that the river is contaminated.

Active Voice: Researchers concluded that the river is contaminated.  
Results demonstrate that the river is contaminated.

In the next example, passive voice is preferred because the action is more important than who performed the action.

Active Voice: We observed cell division in the sample.

Passive Voice: Cell division was observed in the sample

# *Principles of Scientific Writing*

## 6. Write in the proper tense

Use **past tense** for actions performed in the past, including primary and secondary research/source material and most methodology descriptions

- Jones et al. discussed a small yet significant difference...
- Mothers were interviewed in early and late pregnancy...

Use **present tense** for statements of fact, general truths, and conditions that are continuously true. When writing about others' completed research or published findings, generally use past tense; however, if the views of a current researcher are well known and commonly accepted as fact, present tense may be preferred.

- Researchers recognize that folic acid supplements are a potent source of methyl donors, which can induce epigenetic changes by altering...

Use **present perfect tense** to describe action or research that occurred in the past but that is ongoing or connected to the present.

- No previous study has reported the simultaneous effect of...



# *Principles of Scientific Writing*

## 7. Eliminating Redundancy

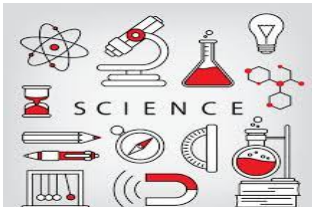
Scientific writing requires a writer to convey complex information **directly** and **concisely** by:

- Using precise action verbs
- Avoiding hedging verbs such as appear and seem
- Limiting the use of prepositional phrases
- Avoiding useless qualifiers such as perhaps, very, quite, several, essentially, basically, always and actually

### **Example:**

Wordy: In the first trial conducted in this experiment, there appears to be a demonstration of the effects when the substances are combined into one.

Concise: The first trial demonstrated the negative effects of combining the substances.



# *Principles of Scientific Writing*

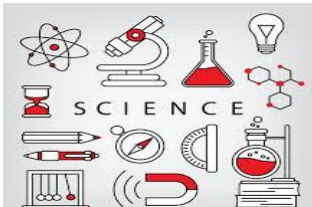
## 8. Make sentences simple and active

Writers in the sciences should **avoid nominalizations** because scientific concepts are already complex and can easily be obfuscated.

### **Example:**

*Nominalization:* An **analysis** of the prefrontal cortex shows the patient's inadequate emotional and behavioral **regulation**.

*Revision with Active Verb:* The researchers **analyzed** the patient's prefrontal cortex and found that he inadequately **regulated** his emotions and behavior.



# *Principles of Scientific Writing*

## 9. Build arguments by connecting sentences

Making arguments is important in scientific writing. It is done easier when your sentences **connect and build off each other**. Since readers focus on concepts at the end of sentences, it is important to begin subsequent sentences by building on the preceding idea and enacting the idea of **end focus**.

### **Example:**

Unclear: **Intramembranous bones**, in the cranium, are ossified from membranes transformed from mesenchymal tissues. The cranial vault, facial bones, the mandible, and the clavicle are **intramembranous bones**.

Clear: Some areas of the cranium are ossified from membranes transformed from mesenchymal tissues and are **called intramembranous bones**. **These bones** include the cranial vault, facial bones, the mandible, and the clavicle.



# *Principles of Scientific Writing*

## 10. Avoid subject-verb separation whenever possible

Because scientific writing often builds off other concepts and theories across fields, it is particularly useful to keep the subject and verb close together to make it easier for layreaders to follow. Keeping subjects and their verbs connected (especially in longer sentences) ensures that readers don't forget who or what is performing the action

### **Example:**

Unclear: **DNA**, found in body fluids (blood, saliva, urine, and semen), soft tissues, bone, teeth, nails, hair roots (nuclear DNA), and hair shafts (mitochondrial DNA), **contains** genetic code.

Clear: **DNA contains** genetic code and is found in body fluids (blood, saliva, urine, and semen), soft tissues, bone, teeth, nails, hair roots (nuclear DNA), and hair shafts (mitochondrial DNA).







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# *Scientific Articles*



**University year: 2021/2022**

**By: MEHELLOU Z.**

# *Analysis of Scientific Articles*



## 1. Definition:

It is a published, relatively concise writing research in a particular field on a specific subject.

A scientific article:

- Is evaluated and validated before its appearance by a reading committee or a group of experts;
- Is published in a specialized periodical, in a conference, or in a collective work;
- Is produced by a specialist or an expert recognized by his peers;
- Always relies on other work and obligatorily cites its sources;
- Allows to check the **reproducibility** of the results which ensures the objectivity of the conclusion and therefore **scientific integrity**

# *Analysis of Scientific Articles*

## 2. Characteristics

- A specific subject
- A precise language (equations, objective & neutral text, scientific tone)
- Complete and concise
- Clear and simple language
- Educational approach
- Time: present → known information, past → manipulation





# *Analysis of Scientific Articles*

## 3. Types

### 3.1. Research paper

It presents original research results.

### 3.2. Review paper

It is an overview on a given problem or subject (analysis and / or point of view).



The difference between a Review paper and Research Paper is that a Review paper is a **secondary** source and research on an already **existing report** whereas a Research paper is a **primary** source and gives an **original report** on a topic done by an individual.

# *Analysis of Scientific Articles*

## 4. Structure

### 4.1. Physical structure

- Layout: full, columnar, margin... etc.
- Character: font, typography
- Document size: page format, dimensions... etc.
- Document volume: number of pages, words... etc.
- Other elements: line spacing, single sided or double sided,... etc.



*Example: Journal of molecular biology*

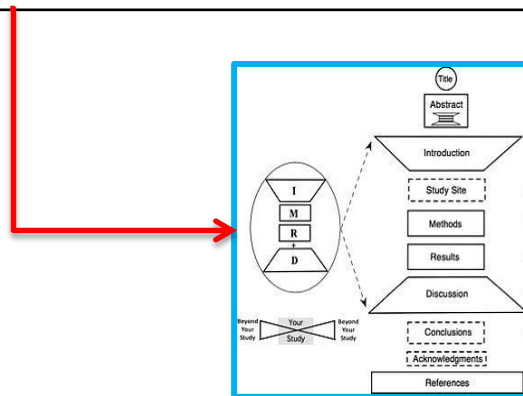
**Articles** are not limited in length but the editors recommend that in most cases they should be no longer than **15 printed pages** with no more than **10 figures** and **4 tables**. Note that **1 printed page** is roughly equivalent to **2.5 pages** in a **Word document** using **double spacing and Arial Font 11**.

# *Analysis of Scientific Articles*

## 4.2. Logical structure

It essentially follows one of three formats:

Format	IMRAD	OPERA	ILPIA
<b>Sense</b>	Introduction Materiel & methods Results And Discussion	Observation Problem Experimentation Results Action	Introduction Literature Problem Involvement *Avenir = Future
<b>Type</b>	Research article	Analytical article	Review article
<b>Sciences</b>	Exact and medical sciences	Applied sciences (technology, ... etc.)	Divers



# *Analysis of Scientific Articles*

The letters in the formats represent the essential units in addition to the keys of the text, including title, summary, keywords, references.

## **A) Title:**

- ✓ Must reflect and announce the content of the text with maximum precision and conciseness
- ✓ Informative words must be placed at the beginning of the title.  
Example: Novel, Alternative, ...



## **B) Authors:**

- Name + one or more initials
- Number: in mathematics 1 or 2, in biology 5 or more
- Order: alphabetical or according to the type of contribution
- Valued positions: 1st and last
- Affiliation of each author

# *Analysis of Scientific Articles*



## **C) Summary:**

- It allows independent reading of the rest of the document (understandable in itself)
- It helps to understand: the context, the problem, the proposed solution, and the perspectives
- It has a structure as follows:
  - 25% (~ 3 sentences) Introduction: background (context, problem, hypothesis)
  - 25% (~ 3 sentences) Experimentation: equipment and methods
  - 50% (~ 6 sentences) Major results: meaning, novelty, consequence


# *Analysis of Scientific Articles*

## **D) Keywords:**

They make it possible to identify the field of research and the major points addressed in the study. Thus, their number depends on scientific journals (generally 5 keywords).

## **E) Introduction:**

It presents an inverted pyramid structure from the general to the specific. It has three parts:



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### **Research domain**

Subject + Focus (state of knowledge + context + problem)

### **Domain boundary**

Specification of the problem

### **Proposed solution**

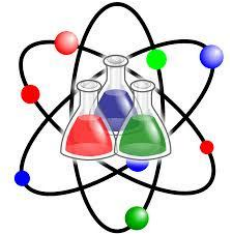
Objectives and possibly the stages of the work

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# *Analysis of Scientific Articles*

## **F) Material and methods:**

The study material can be biological such as animal, plant, and / or cell, or non-biological such as glassware and devices. The methods are presented by experiments, protocols, and / or tests.



## **G) Results:**

All the data obtained after the practical work. They are generally presented by figures, tables, curves, histograms, etc.

## **H) Discussion:**

It has a **pyramid** structure from **the specific to the general**. It gives a clear answer to the question posed in the introduction as it explains how the results support the conclusion.

# *Analysis of Scientific Articles*

## **I) Conclusion:**

It presents the solution to the problem and the sustained perspectives of the study carried out.

## **J) Bibliographical references:**

They are illustrated under APA (American Psychological Association) style conditions.





# *Analysis of Scientific Articles*



## 5. Articles analysis

1. Browse the article and define its structural format (ex: IMRAD)
2. Establish the essential points from:
  - **Document:** title, key words, summary, titles of figures and tables, the 1st and the last two sentences of the introduction.
  - **Paragraphs:** words and sentences to look for (ex: unexpected, surprising, we hypothesize that, in contract with previous work ... etc)

**Note:** You must research and identify unfamiliar terms or techniques to fully understand the research topic and study concepts.

# *Analysis of Scientific Articles*

3. Generate questions and be careful of your understanding:

- The credibility of the work (authors, journal, etc.)?
- Understanding of the work (terminology)?
- Reading time (less important parts)?
- The specific issue?
- The appropriate method? And the main results?
- Proof of the interpretation (other exploitation)?
- How do the results relate to my own work and / or research?
- Perspectives (application, other experiences for the remaining questions)?



# *Analysis of Scientific Articles*

4. Draw conclusions from prior knowledge and from the context of the article (not all information learned is explicitly stated)

5. Take reading notes:

- ❖ Reference
- ❖ Keywords
- ❖ General topic
- ❖ Hypothesis
- ❖ Methodology
- ❖ Results
- ❖ Summary of key points
- ❖ Context (relation with other works)
- ❖ Meaning (importance)
- ❖ Important figures and / or tables





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# *Analysis of a Scientific Article*

## **// Example //**



**University year: 2021/2022**

**By: MEHELLOU Z.**

# *Analysis of a Scientific Article*



## APPLICATION

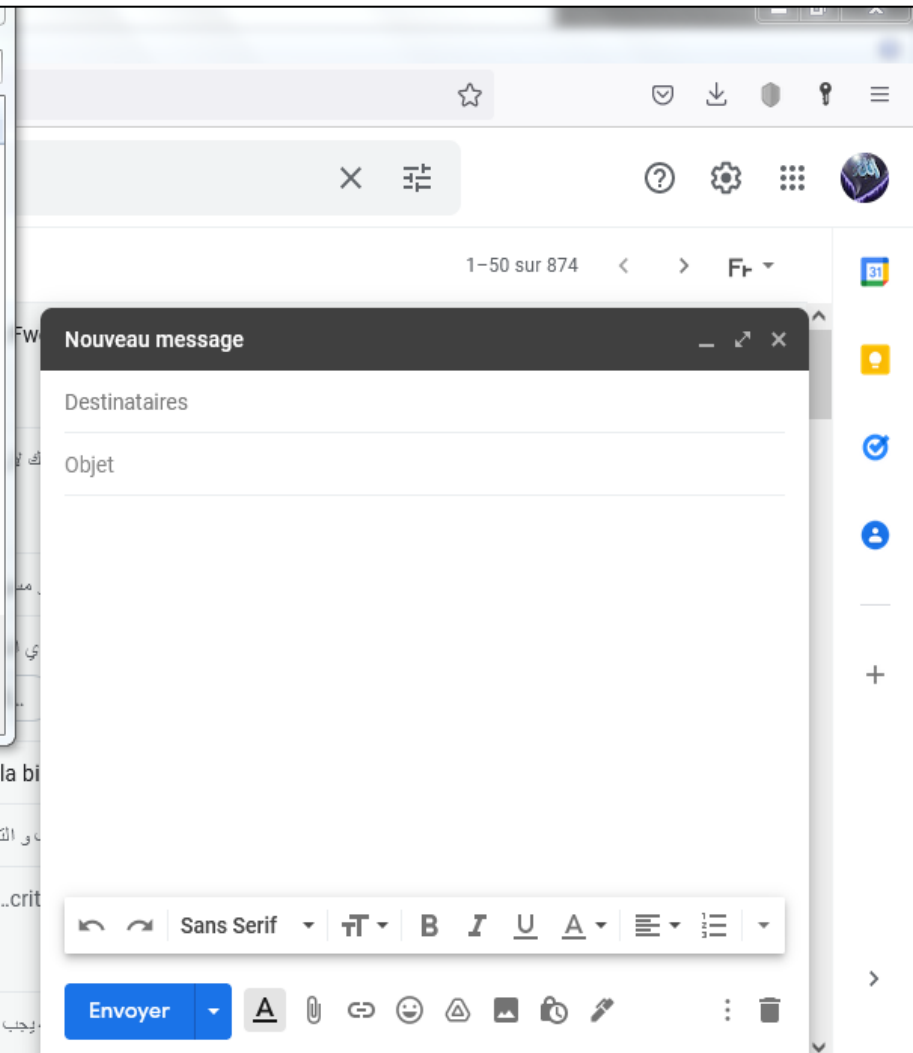
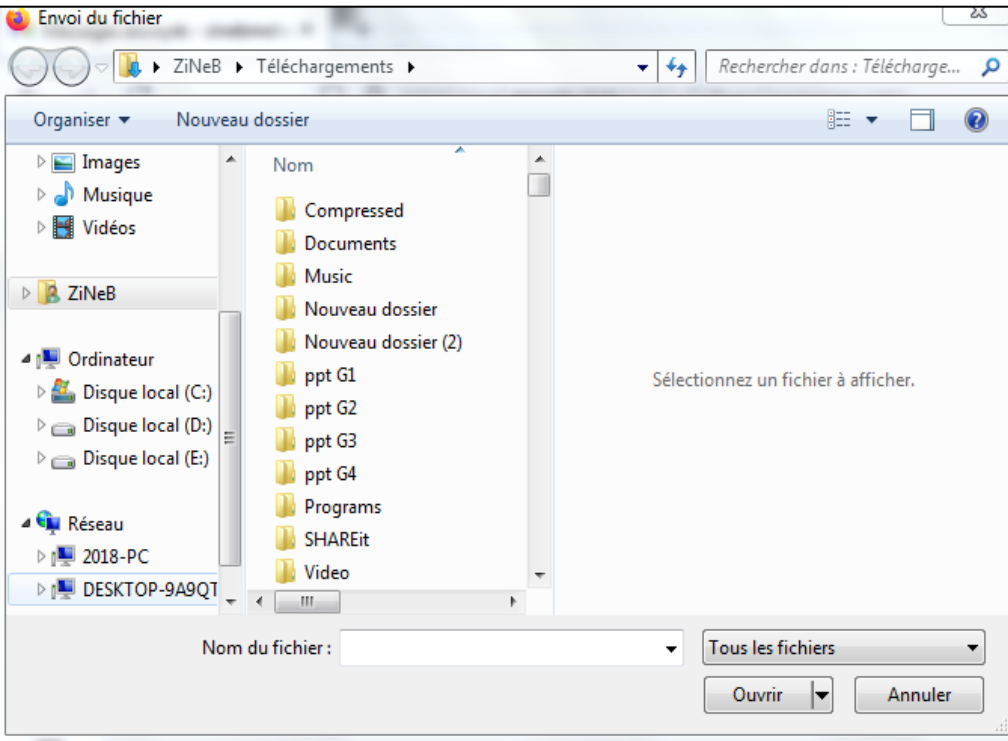
Science Direct: <https://www.sciencedirect.com/>

Sci-hub: <https://sci-hub.se/>

Mail: [zinebmehellou@gmail.com](mailto:zinebmehellou@gmail.com)







# *Analysis of a Scientific Article*



**Full name: XXXX - XXXXX**

**Group: X**

**Level: 3rd Year (L3)**

**Specialty: Biochemistry / Toxicology**

**Subject: Scientific English (ECT)**

**Title:**

**Analysis of**

**« The title of the article »**

**Academic year: 2021/2022**





# *Analysis of a Scientific Article*



- 1. Reference (2pt)**
- 2. Study objective (2pt)**
- 3. General theme (2pt)**
- 4. Specific theme (2pt)**
- 5. Summary of key points (2pt)**
- 6. Critics in French (6pt):**
  - ✓ **Proof of the interpretation**
  - ✓ **Other perspectives**
  - ✓ **Writing errors**



# *Example of an Analysis of a Scientific Article*

**Title:**

**Analysis of**

«  $\beta$ -glucan release from fungal and plant cell walls after simulated gastrointestinal digestion »




Google mycoprotein

Environ 205 000 résultats (0,51 secondes)

<https://www.healthline.com/health> Traduire cette page  
**Mycoprotein: What It Is, Potential Side Effects, and Benefits**  
 16 août 2018 — **Mycoprotein** is a protein made from *Fusarium venenatum*, a naturally occurring fungus. To create **mycoprotein**, manufacturers ferment fungi spores ...  
 Fungal protein · Is it safe? · Alternatives

<https://en.wikipedia.org/wiki/My...> Traduire cette page  
**Mycoprotein - Wikipedia**  
**Mycoprotein** (lit. "fungus protein") is a form of single-cell protein, also known as fungal protein, derived from fungi for human consumption.  
 History · Synthesis · Health concerns · Nutrition potential

<https://www.quorn.co.uk/mycopro...> Traduire cette page  
**Mycoprotein | Vegetarian & Vegan Protein | Quorn**  
 Quorn's **mycoprotein** is a source of protein that is high in fibre and low in saturated fat. To make



Plus d'images

**Mycoprotéine**

Google white button mushroom

Environ 35 500 000 résultats (0,60 secondes)

<https://en.wikipedia.org/wiki/Ag...> Traduire cette page  
**Agaricus bisporus - Wikipedia**  
 When immature and **white**, this mushroom may be known as common mushroom, **white** mushroom, **button mushroom**, cultivated mushroom, table mushroom, and champignon ...

Other constituents :	Quantity	Vitamin C : 3% 2.1 mg
Water :	92.46 g	Vitamin D : 1% 0.2 µg


Names · Description · Cultivation history · Nutritional profile

**Autres questions posées**

How is the Flavour of white button mushroom? ▾

What is white button mushroom used for? ▾

Commentaires



Plus d'images

**Champignon de Paris (Agaricus bisporus)**

Google oat plant

Environ 41500000 résultats (0,56 secondes)

<https://en.wikipedia.org/wiki/Oat> Traduire cette page

### Oat - Wikipedia

The **oat** (*Avena sativa*), sometimes called the common **oat**, is a species of cereal grain grown for its seed, which is known by the same name (usually in the plural ...

Family : Poaceae Kingdom : Plantae  
Genus : Avena Species : A. sativa

Oat milk · Kherson oat · Oat sensitivity · Oat (disambiguation)


<https://www.britannica.com/topic/oats> Traduire cette page

### oats | Definition, Types, Uses, & Facts | Britannica

oats, (*Avena sativa*), domesticated cereal grass (family Poaceae) grown primarily for its edible starchy grains. **Oats** are widely cultivated in the temperate ...

<https://www.britannica.com/plant/oat-plant> Traduire cette page

### oat plant | cereal | Britannica



**Avoine**  
Plante

L'avoine cultivée, parfois appelée «avoine commune

Google barleyl

Environ 1620000000 résultats (0,66 secondes)

Résultats pour **barleyl**  
Essayez avec l'orthographe barleyl

orge f. **Barley** is a cereal used to make beer. L'orge est une céréale utilisée dans la fabrication de la bière.

<https://www.linguee.fr/anglais-francais/barley>


### barley - Traduction française – Linguee

À propos des extraits optimisés · Commentaires

#### Autres questions posées

Quelle est la différence entre le blé et l'orge ?

Qui mange de l'orge ?

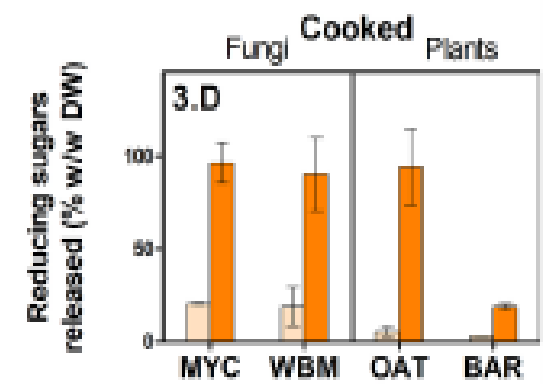
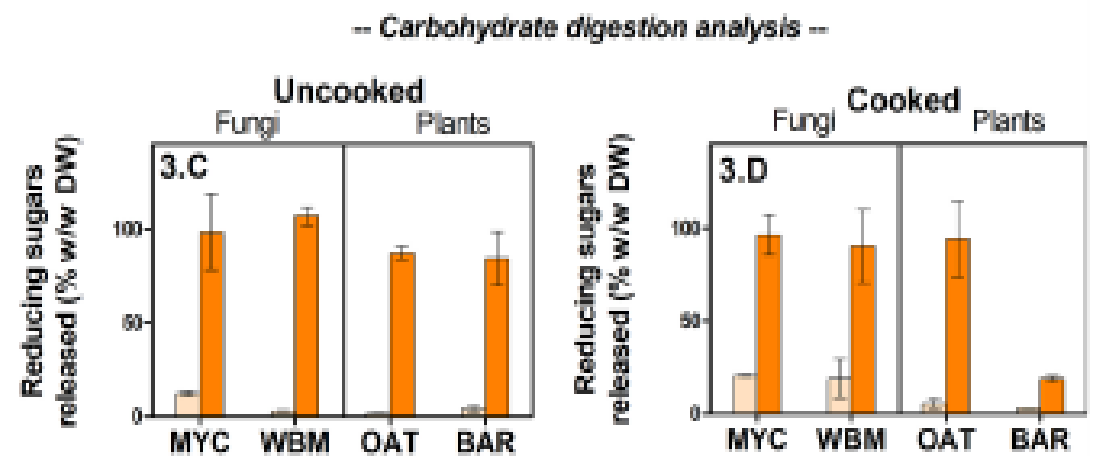
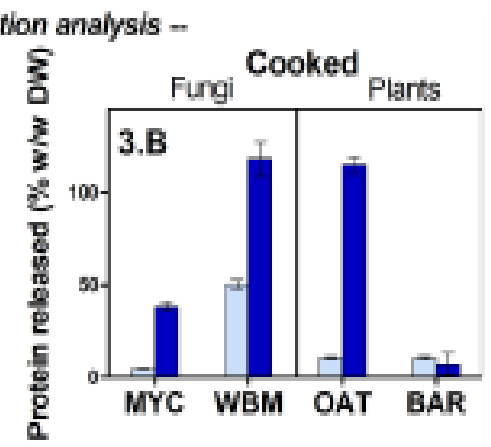
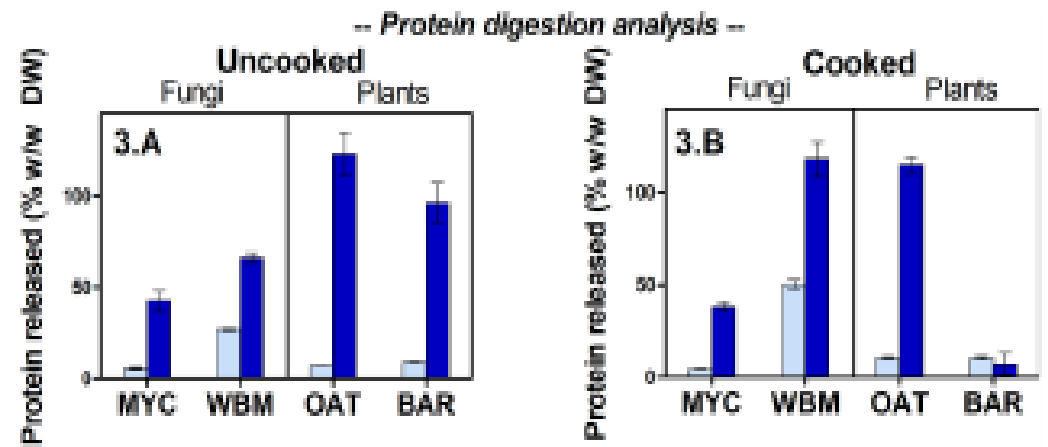
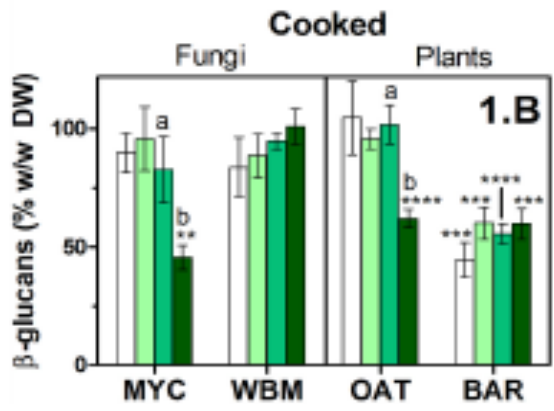
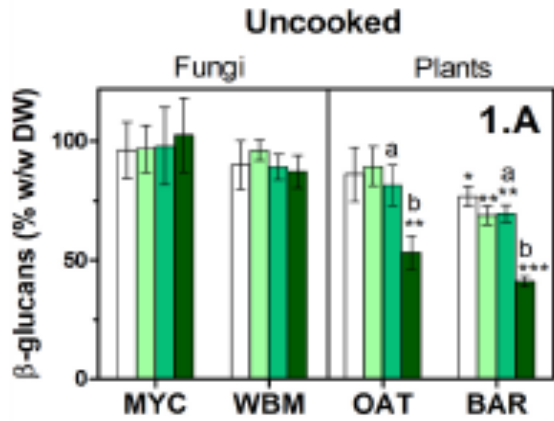
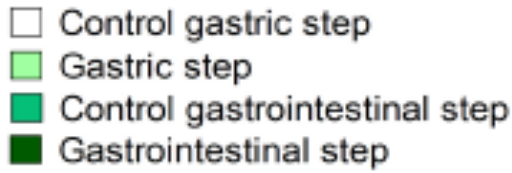


**Orge commune**  
Céréale

L'orge commune est une céréale à paille, plante herbacée annuelle de la famille des Poaceae, sous-famille des Pooideae. Elle fait partie des plus anciennes céréales cultivées. [Wikipédia](#)

## Abstract

$\beta$ -glucans are soluble fibre found in plant and fungal cell walls, which are linked with reduced serum lipid levels. This study investigates the  $\beta$ -glucan release from two fungal samples (mycoprotein and white button mushroom) compared with two plant samples, oat and barley bran. Our results indicate no  $\beta$ -glucan release after the simulated gastrointestinal digestion of the uncooked fungal samples. In contrast, following cooking and digestion,  $\beta$ -glucans were released from the mycoprotein matrix. Pancreatic enzymes facilitated the solubilisation of  $\beta$ -glucans. Protein and carbohydrate digestion appeared independent of  $\beta$ -glucan release in both uncooked and cooked samples. Conversely, the viscosity increased in the samples that showed a significant release of  $\beta$ -glucans at the end of gastrointestinal digestion. Structural analysis by scanning electron microscopy showed changes in the uncooked and cooked samples before and after digestion. This study shows for the first time the different behaviour in  $\beta$ -glucan release from fungal and plant samples.



(a)

UNCOOKED

MYC

WBM

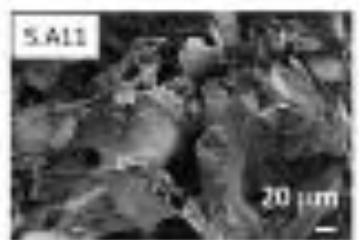
OAT

BAR

Before GI digestion



After GI digestion



(b)

COOKED

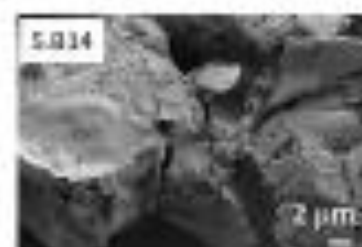
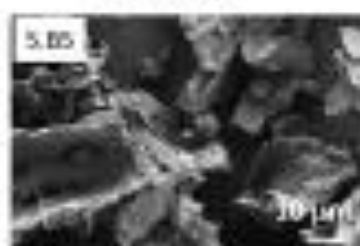
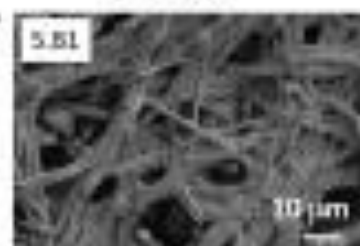
MYC

WBM

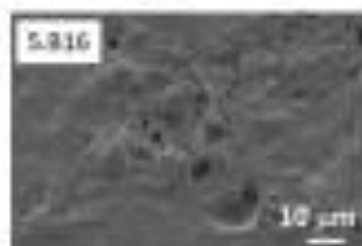
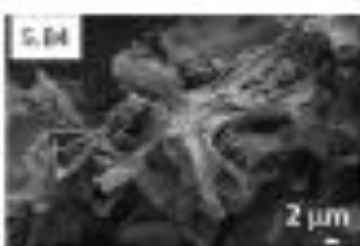
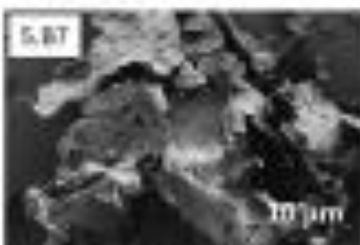
OAT

BAR

Before GI digestion



After GI digestion





# *Analysis of a Scientific Article*



- 1. Reference :** Colosimo R., Mulet-Cabero A. I., Cross L. K., Haider K., Edwards H. C., Warren J. F., Finnigan J. A. T. & Wilde J. P. (2021).  $\beta$ -glucan release from fungal and plant cell walls after simulated gastrointestinal digestion. *Journal of Functional Foods*, 83 (104543). <https://doi.org/10.1016/j.jff.2021.104543>
- 2. Study objective:** Comparison between fungal and plant  $\beta$ -glucan gastrointestinal digestion;
- 3. General theme:** Polysaccharides;
- 4. Specific theme:**  $\beta$ -glucan gastrointestinal digestion;

# *Analysis of a Scientific Article*



## **5. Summary of key points:**

- **Key Point 1:**
- **Key Point 2:**
- **Key Point 3:**

## **6. Critics:**

**Preuve de l'interprétation:**

.....

**Autres perspectives:**

.....

**Erreurs de rédaction:**

.....

A vibrant watercolor splash background with colors ranging from yellow and orange to pink, purple, and blue. The splash is centered and has a soft, painterly texture. A faint 'dreamstime' watermark is visible behind the text.

Thank  
you!

ANY  
Questions?