

Projet MACH1

The title of your work

Student name

*MACH1, Promotion Romarin 2024, Avignon Université.**

First promoter and Second promoter

promoter affiliations

Third promoter

Another promoter affiliation

(Dated: December 19, 2025)

A concise summary of your research. The following example outlines a typical structure for an academic article, which may be adjusted to accommodate the specific requirements of your work.

Keywords: Suggested keywords

1 Introduction

Provide a concise overview of the content and primary focus of your article. In practice, this section usually (i) introduces the scientific context, (ii) states the problem, and (iii) summarizes the approach and main findings. For instance, you may support a general statement with a single citation [1].

A second paragraph helps you check indentation, spacing, and line breaks across pages. You can also use it to announce the structure of the paper (e.g., experimental setup, results, and discussion) and to define any key terms or abbreviations used throughout the manuscript.

2 Examples (equations, figures, table)

This short section is only here to test the layout. Equation (1) and Eq. (2) illustrate math typesetting, Fig. 1 (single column) and Fig. 2 (double column) test figure placement and captions, and Table I demonstrates a publication-quality table.

2.1 Citations

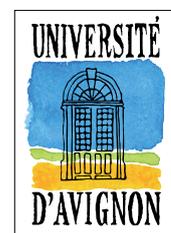
You can cite several references at once, for example [1–3]. A citation can also include optional text, e.g. [4, and references therein].

If author-year style commands are enabled by the bibliography/citation setup, you can cite authors directly in the sentence (`\citet{dummy2020}`) or in parentheses (`\citep{dummy2020}`). Other useful commands are `\citeauthor{dummy2020}` and `\citeyear{dummy2020}`.

Example (may depend on the selected citation style): Smith [1] discuss this topic. Related background can be found elsewhere [5]. We also reference Durand (2021) for a thesis-style source.

2.2 Equations

A short paragraph before an equation is useful to test line breaking and spacing. As a simple analytical chemistry example, the Beer–Lambert law links absorbance A to



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Figure 1. Former logo of Avignon Université.

concentration c through the molar absorptivity ε and optical path length ℓ (see, e.g., [1, Chap. 2]).

$$A = \varepsilon \ell c \quad (1)$$

A second paragraph after the equation helps visualize the vertical whitespace around display math. You can also test cross-references (Eq. (1)) and different citation patterns, for example multiple references in a single call [2, 3].

As a second example, we use a normalized Gaussian distribution. The first line defines $f(x)$, and the second checks the normalization by integration.

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right), \quad (2)$$

$$\int_{-\infty}^{+\infty} f(x) dx = 1. \quad (3)$$

2.3 Figures

To reduce awkward float placement (and potential underfull/overfull boxes), it is often better to use widths relative to the current column (`\linewidth`) for single-column figures, and to the full page (`\textwidth`) for double-column figures.

2.4 Table (booktabs)

For publication-quality tables, `booktabs` provides well-spaced horizontal rules: use `\toprule` for the header line,

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Figure 2. Present logo of Avignon Université (full width).

`\midrule` to separate header from body (and optionally between logical blocks), and `\bottomrule` to close the table. As a rule of thumb, avoid vertical rules and avoid double rules; let whitespace do the work.

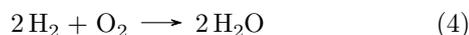
Table I. Example publication-quality table using `booktabs` and numeric alignment via `siunitx`.

Sample	C_0 (mg L ⁻¹)	Recovery (%)
S1	1.00	98.4
S2	2.50	9.21
S3	5.00	79.6

2.5 Chemistry notation (using the `chemmacros` and `chemformula` packages)

The class loads `chemmacros`, so you can write chemical formulae with `\ch{...}`, for example H₂O, NaCl, H₃O⁺, or isotopes such as ¹³C.

Reactions can be typeset in a compact form:



Equilibria and phase/charge annotations are also supported, e.g. CO₂ + H₂O \rightleftharpoons H₂CO₃ and Fe³⁺(aq).

2.6 Units and numbers (`siunitx`)

Use `siunitx` to format numbers and units consistently: 12345, 3.2 × 10⁻⁴, and 1.23(4). Common quantities can be written as 25 °C, 1.0 mmol L⁻¹, or 10 µg mL⁻¹. Ranges and lists are supported too: 400 nm to 700 nm and 1 mg L⁻¹, 2.5 mg L⁻¹ and 5 mg L⁻¹.

3 Experimental section

This section should be detailed enough for someone else to reproduce the work. In the final version, you can split it into subsections for samples, instrumentation, reagents, and data processing. Keep units consistent and report uncertainties when relevant.

3.1 Material

List all chemicals, standards, consumables, and instruments used in the study. For each reagent, you can indicate supplier, purity grade, and reference number

when important. For instruments, give the model and manufacturer, plus any specific configurations.

3.2 Methods

Describe the experimental protocol step by step (sample preparation, calibration, acquisition parameters, and quality controls). Mention how many replicates were performed and how outliers (if any) were handled. If you used software, give the version and key settings.

4 Development

Use this section for bibliographic background and for the rationale behind your choices. You can compare several approaches from the literature, justify the selected method, and highlight what is new in your work [4].

A second paragraph is useful to test multi-paragraph layout: you may introduce a conceptual scheme, a reaction mechanism, or a workflow, then discuss its limitations and how you addressed them (controls, validation dataset, robustness checks). If you cite a web resource, it typically appears like this [5].

5 Result ans discussion

Present the main results using figures and tables, then interpret them. Start with a short summary of what is observed (trends, orders of magnitude), then discuss plausible explanations and compare with the literature [2].

In a second paragraph, comment on the reliability of the results (error bars, repeatability, detection limits) and on the practical implications. You can also cite a thesis as background or methodology support [3]. End the section by clearly stating the take-home message and what remains uncertain.

6 Conclusion

Conclude by restating the objective and the main findings in a few sentences. Mention the limitations and propose a short outlook (future experiments, applications, or improvements to the method). If relevant, include one sentence on how the work fits the broader context.

Acknowledgments

If you want to thank someone.

[1] A. Smith, *Handbook of Placeholder Chemistry*, 2nd ed. (Fictitious Press, Paris, 2020).

[2] J. Doe and M. Dupont, A minimal test reference for bibtex, *Journal of Example Results* **42**, 1 (2025).

[3] C. Durand, *Méthodes analytiques fictives pour la mise en page: une étude de cas*, Ph.D. thesis, Avignon Université, Avignon, France (2021).

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[4] P. Martin and L. Nguyen, A conference paper with invented data for layout testing, in *Proceedings of the International*

Symposium on Examples (Lyon, 2019) pp. 101–108.

[5] J. Roe, Online notes on sample formatting (dummy reference), <https://example.com> (2023), accessed: 2025-12-17.