

How to write a thesis correctly?

(bachelor's or master's thesis)

Why write a thesis?

- BMLT and KB is a preparation for working in the health sector, but...
- Faculty of Science is a research-oriented faculty
- Opportunity to focus on medical research
- **Medical accreditation**
- The emphasis on a scientific approach at the Faculty of Science ensures a high quality of graduates - experience in analysis, statistics, data interpretation
- This leads to the elaboration of a bachelor's and master's thesis

What are you supposed to learn through DP?

- Autonomy and self-initiative
- Work with information resources (literature, databases)
- English language
- Understand the topic
- Analysis, interpretation and presentation of data in the context of current knowledge
- Scientific procedure
- Scientific expression - precise wording, no unnecessary ballast, ichform
- Orientation in the laboratory, experiment (experimental work)

Types of work on KME

- Undergraduate
 - Experimental
 - Research - not automatically easier, higher demands on working with literature
- Independence, working with literature, learning techniques and experimental work
- A positive result is an advantage, but not essential
- Master's (diploma)
 - Experimental
- Independent project with original results

The topic is determined by the supervisor in agreement with the student
(internal x external trainer, guarantor)

Presented results must be original

Bachelor thesis research

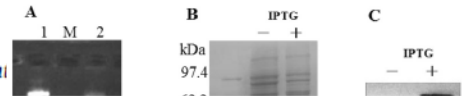
- It must not be merely a compilation of the literature on the subject
- It is necessary for the student to apply his/her own opinion to the problem and propose a solution based on the literature studied
- The intellectual input of the student must be found in the research paper.

The diploma has the structure of a scientific article

3. Results

3.1. Identification of recombinant

The constructed vector of restriction enzyme digestion



was highly expressed in IPTG induced BL21 cells, while the whole protein profiles were almost the same (Fig. 2B). Western blot detection was followed by using anti-His6 antibody, which also showed IPTG had a significant expression induction to the target protein (Fig. 2C). Meanwhile, it also demonstrated that PLI γ protein

Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.toxicon.2015.10.018>.

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Faure, G., Villela, C., Perales, J., Bon, C., 2000. Interaction of the neurotoxic and nontoxic secretory phospholipases A2 with the crotoxin inhibitor from *Crotalus* serum. *Eur. J. Biochem./Febs* 267, 4799–4808.

Garcia Denegri, M.E., Acosta, O.C., Huancahuire-Vega, S., Martins-de-Souza, D., Marangoni, S., Marunak, S.L., Teibler, G.P., Leiva, L.C., Ponce-Soto, L.A., 2010.

Fig. 3. Optimization and verification of cultural conditions by orthogonal test. (A) Western Blot of PLI γ expression of 16 trials as listed in Table 1. B to F: The impact trend of the five factors and four levels. Four of them, except IPTG concentration had a great impact on PLI γ expression. (G) Western blot quantitation and comparison of high expression trials and the optimal conditions (Opt). PLI γ expression (valuated by volume = band area \times intensity) in Opt group was 2–5 folds higher than these five highest trials No. 9, 12, 13, 14 and 15.

1. Abstract
2. Introduction
3. Materials and methods
4. Results
5. Discussion
6. Conclusion
7. Acknowledgements
8. References

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Structure of the thesis

- Front page
- Annotation
- Author's declaration with signature
- Acknowledgements
- Table of Contents
- List of abbreviations used
- Home
- Objectives of the work
- Material and methods
- Results
- Discussion
- Summary/Conclusion
- List of literature used

Formalities

1. Title page - Title, author, supervisor, university, bachelor/master thesis, place
2. Annotation = Summary (Czech and English)
3. Author's statement - **exact wording!**
4. Acknowledgements

Measures of the Vice-Dean

<http://www.prf.jcu.cz/data/files/8/81/151/294opatrenipredkladanipracibakmag.pdf>

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OBSAH

- Necessary, before the introduction
- Multi-level numbering recommended

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Introduction

- Introduction to the issue - why it is important to address it
- How the specific topic under study fits into a broader context (E.g. how the study of one molecule relates to the treatment of asthma)
- literature review on the topic, research

Literature review

- What is known about the issue under study
- Proceed from general to specifics
- Critically evaluate information and put it into context
- **Citations** - especially primary (x review)
- Beware of internet sources (do not quote Wikipedia or popular science literature or textbooks)
- Cite author(s) last name(s) and year (Hayes 1985, Hayes and Levine 1999, Hayes et al. 2001)
- Include images in text (cite source)

Objectives of the work

- Briefly define the main and sub-objectives of the work

Material and methods (Materials and methods)

- List of chemicals and materials used
 - Composition of solutions (molarity, normality, %)
 - For "kits", antibodies, cell lines and other chemicals purchased, provide the exact name and manufacturer or catalog number
 - Suitable in the form of a table with division by methods
- Detailed description of methods (citation of sources) so that experiments can be repeated. Usually the principles of the methods are not described
- Experimental objects - exact name of the species (origin, cultivation)
- Organisation of experiments
- Details of statistical methods and procedures
- For bioinformatics methods, indicate the computer program used or the address of the server
- For methods that we did not perform ourselves, provide a

Results (Results)

- Objective description of the results obtained
- Chronological progression, mentioning the continuity of experiments, structured
- Combination of text and images
- Description of the result + link to the picture
 - Test substance 1 reduced NO production by macrophages by 40%, while substance 2 had no observable effect (Figure 1).
- **Only objective description, i.e. without interpretation and conclusions**

Results - pictures, tables

- Figures or tables accompanied by a label, a one-word description of the result and descriptive text
- If statistics are used, state the SD or SEM, the test used and the level of significance

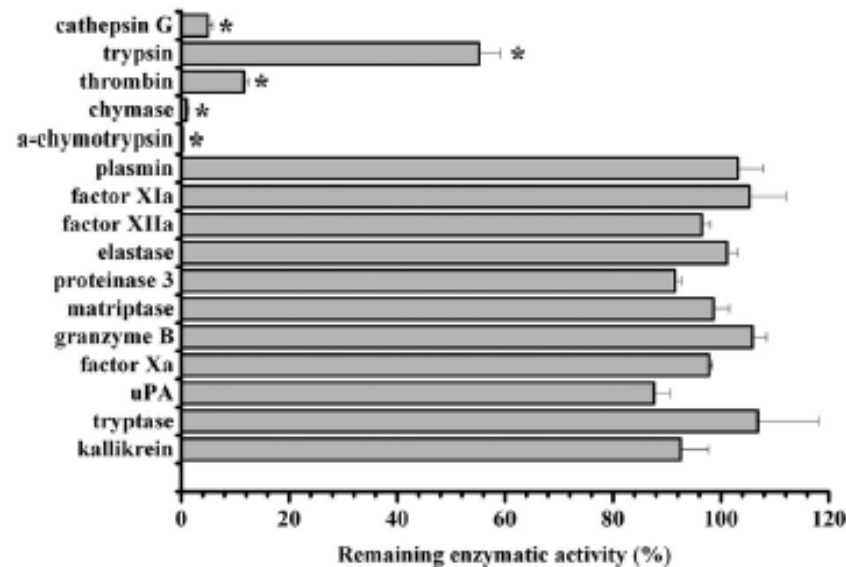


Figure 4. Inhibitory specificity of IRS-2. IRS-2 (400nM) was tested against 16 different serine proteases in triplicates. The enzyme concentration is stated in supplemental Table 2. Bars represent the mean remaining enzymatic activity in the presence of IRS-2, while error bars represent the SEM. Enzymes with an asterisk were inhibited with a statistical significance (*t* test; $P < .05$).

Results - pictures, tables

- The link in the text should precede the graph or table
- Document results in one form only (table or graph)
- The accompanying text is not intended to describe data that can be read from the table
- Graphs - **statistical significance, standard deviation (SD, SEM) - NOT NECESSARY** when comparing groups
- Microphotography - scale

Discussion (Discussion)

- The most important (and most difficult) part of the job
- Interpretation of results, may also refer to images
- Comparison with other authors - citations, references
- Speculation must have some support in the cited literature
- The author demonstrates that he has a sufficient understanding of the issue and is able to infer the significance of the results
- Recommended length: 3 - 5 pages

Summary (Conclusion)

- The most important results achieved
- Evaluation of whether the objectives have been achieved
- Scope: one page
- No longer contains links to individual results
- It may include challenges and future prospects for where further research should go

List of references (References)

- Full citations of articles in scientific journals
- **Uniform format!!!**
- Possible programs - EndNote (paid), Mendeley (Freeware)
<https://www.mendeley.com/newsfeed/>

In the text

(Gillham et al., 1962)

In the list of used literature

Gillham, N.V., Levine, R.P. (1962): Studies on the origin of streptomycin-resistant mutants in *Chlamydomonas reinhardtii*. Genetics 47: 1463-1474.

<http://www.natur.cuni.cz/biologie/genetika/soubory/mgr-studium/pravidla-diplomovych-praci-kgm>