

Department of Biochemistry & Microbiology

Guidelines & Suggestions for Preparation of Honours Theses

Each candidate must submit one copy of their completed thesis to their supervisor and to *each* of their examiners on or before the due date. No copies need be submitted to the main office or to the honours coordinator. The submitted version of the thesis should be the final version. It must not be a draft version of the work.

A typical undergraduate thesis is usually less than 50 pages. There is no maximum allowed length; although your examiners will value brevity. Nevertheless, your supervisor may suggest or require that you include a large number of figures, tables and graphs that give the appearance of bulk without actually being verbose. Neither the references nor appendices count toward the length of a thesis.

The thesis and its defense are designed to allow the student to demonstrate their knowledge of the stated hypothesis and research methodology underlying a specific set of experiments. *The student is judged primarily on how well they understand the hypothesis and the experiments and secondarily on the significance of any finding.* This means that a student can successfully write and defend a thesis with incomplete or inconclusive results.

These guidelines should help you to organize your thoughts so that your examiners can evaluate your performance.

A thesis usually consists of the following:

Title page	<i>(sample attached)</i>
Abstract	<i>(not more than 1 page)</i>
Dedication	<i>(optional)</i>
Acknowledgements	<i>(recommended)</i>
Table of Contents	<i>(recommended)</i>
List of Tables	<i>(optional - consult your supervisor)</i>
List of Figures	<i>(optional - consult your supervisor)</i>
Text	<i>(usually 1.5 spaced but may be double)</i>
Introduction	
Materials and Methods (also called Experimental)	
Results	
Discussion	
Conclusions	
References	
Appendices	<i>(if necessary)</i>

The preliminary pages are usually numbered using small Roman numerals, - i -, - ii -, - iii -, - iv -, etc. The Title page is page - i -, but the page number does not appear on this first page. The Abstract is page - ii -, etc. The rest of the thesis, beginning with the first page of the Text, is sequentially numbered using Arabic numerals beginning with - 1 -.

DETAILED GUIDELINES FOR TEXT, REFERENCES AND APPENDICES

Figures and tables may be included anywhere in the text. They should include a descriptive title, and sufficient explanation of the experimental protocol in the legend so as to be understandable without excessive reference to the text. A large or detailed figure or table may be split over multiple pages, with the column headings and legend on both pages.

Figures and illustrations should include a comprehensive legend containing a descriptive title, a brief description of the experiment and a key to any symbols used. Any illustration that does not reproduce well should be included in its original form within each copy of the thesis. Legends to figures and tables should be single-spaced.

ABSTRACT

Usually not more than 1 page, the abstract sets out the objectives of the research (which may include the hypothesis), a mention of the methods used in the investigation, and the primary conclusions. It should not contain a detailed introduction or any citation to the literature, and is designed to allow the reader to appreciate the significance of your findings without providing experimental details.

INTRODUCTION

The introduction should mention the subject of the thesis and give a brief but critical review of pertinent literature. *You should not give a detailed introduction describing any particular method that you used during your research, but you should be prepared to describe these methods at your defense.* Indicate the state of current knowledge of the subject at the beginning of your studies and clearly formulate the problem chosen for research and the approach to be used in the investigation. Point out any important aspects of your approach that are unusual and mention any important limitations.

The Introduction should contain a clear statement of the hypothesis that you seek to test with your experiments.

References in the Introduction and elsewhere in the thesis should follow one of the two formats outlined (*see below*). Total length of the introduction is usually 8 to 15 double spaced pages but can be longer if necessary.

2. MATERIALS AND METHODS

The purpose of the Materials and Methods section is firstly to allow a reader to evaluate the soundness of your methods, and secondly to allow a reader to reproduce your experiments. This section should be written in the format of a typical paper in a biochemical or microbiological journal. Standard methods should be cited without comment whereas modifications to established methods should be identified. In either case a phrase or sentence should describe the principle of the method if it is new or unusual. Detailed procedures may be included in an appendix, if desired. The make and model of important major equipment (such as centrifuges, thermocycler, HPLC, etc.) should be identified here, as should be the source of chemicals, kits, etc.

3. RESULTS

The results of your experiments consist of key observations that further the state of knowledge of your chosen research target, and should be stated without discussion; however, sufficient commentary should be included so that experiments are linked together

and the rationale for the experimental procedure is clearly defined.

4. DISCUSSION

The discussion should be an interpretation of the results. Reference should be made to the literature cited in the introduction, and the relevance of the research should be clearly stated. A certain amount of speculation is allowed, but it must be clearly identified.

Since the nature of biochemical and microbiological research varies, no strict guidelines can be laid down as to the optimal or maximal lengths of the results and discussion sections. In special cases, where the subject matter warrants, the format may be altered *with the approval your supervisor*. For example, a combined “**Results and Discussion**” section might be more appropriate for your work.

5. CONCLUSIONS

A paragraph summing up your findings and emphasizing any novel aspect of the research is often a valuable aid to a reader. The conclusion should be no more than 1 page.

6. REFERENCES

One of two reference systems may be used:

A. Sequential numbering of the references in the text, with a listing in the reference section in the order of first appearance in the text.

in text:

Vitellogenin was extracted as previously described (1).

Subsequent references to this paper in the text would also be indicated as (1).

in references: (listed in strict order of appearance in the thesis)

(1) Wiley, S.H., Opresko, L. and Wallace, R.A., (1979) New methods for the purification of vertebrate vitellogenin. *Anal. Biochem.* **97**, 145-152.

This format is the briefest citation method; however, it is more prone to problems than the second method shown below. It is also cumbersome during editing or re-writing.

B. Alphabetical listing. In the text authors and year are listed, in the reference section the papers are listed alphabetically, based on first author.

This method requires more space than sequential numbering but is more informative and reduces the problems encountered by double-citation and/or elimination of references. A paper with three or more authors is cited using the “*et al.*” convention (Latin abbreviation for “and others”). Note that any expression in a language other than English is usually written in italics:

in text:

Vitellogenin was extracted as previously described (Wiley *et al.*, 1979).

A paper with one or two authors would be cited using all authors:

in text:

(Hastie and Held, 1978) or (Hastie & Held, 1978).

In this method, all sources in the references are listed alphabetically by the family name of the first author, and all names must be used even if the citation used the "et al." convention.

Hastie, N.D. and Held, W.A. (1978) Analysis of mRNA populations by cDNA-mRNA hybrid-mediated inhibition of cell-free protein synthesis. *Proc. Natl. Acad. Sci. USA* **75**, 1217-1221.

Wiley, S.H., Opresko, L. and Wallace, R.A., (1979) New methods for the purification of vertebrate vitellogenin. *Anal. Biochem.* **97**, 145-152.

In the event that several papers are written by the same scientists, they should be listed in chronological order in the references. In the event that several papers are written by the same scientists in the same year the papers should be listed as 1979a, 1979b etc. Note that this format is exactly the same as the first method apart from the deletion of the numbering scheme.

Books, or Chapters in books are usually referenced as shown below:

Bruchovsky, N., Rennie, P.S. and Wilkins, R.P. (1980) *In: Steroid Receptors, Metabolism and Prostatic Cancer*, Eds.: F.H. Schroder and H.J. van Voogt (Excerpta Medica, Amsterdam) pp 57-75.

References should be single spaced, with a half line between entries.

GENERAL FORMAT OF THESES

The thesis should conform to the following formats:

PAPER SIZE: 8 1/2" x 11"

COLOUR: Black print on white paper. Coloured text may only appear in tables or figures.

SECONDARY COPIES: Secondary copies may be photocopies, as long as the paper used conforms to the specifications and the print is sharp.

FONT: The same type font must appear throughout. Ornate font styles are not acceptable. Italics may be used for emphasis only. The text must be 1.5 or double-spaced. Footnotes, Table and Figure legends, quotations of five lines or more and references should all be single-spaced. Top, bottom and right edge margins should be 1 inch (2.5 cm), and the left edge should be 1.25 inches (3.2 cm). This applies to figures and tables.

FOOTNOTES: Footnotes normally appear on the same page as their reference. There should be a line separating the text from the footnotes.

PAGINATION: There should be only two sets of page numbers - small Roman numerals for the preliminary pages (beginning with ii for the Abstract), and Arabic numerals for the text, references, and appendices (beginning with 1 for the introduction).

COPYRIGHT: The international copyright symbol should appear, typed at the foot of the title page of the thesis. (See example on last page).

BINDING: The thesis should be submitted bound by fold-back clips as permanent bindings and covers will be arranged. Staples or any form of permanent binding is not permitted.

Consult your supervisor or the honours coordinator if you have any questions.

Sample title page:

THE POLYADENYLATION OF MOUSE mRNA DURING
MAMMARY GLAND DEVELOPMENT

Sonia P. Davis

Thesis submitted to the
Department of Biochemistry & Microbiology
in partial fulfillment of the requirements for the degree of
Bachelor of Science (Hon.)

University of Victoria
Victoria, British Columbia, Canada
May 2001

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