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## The thesis guidelines: procedures for completion and presentation

Jefferson College of Graduate Studies

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**MASTER OF SCIENCE PROGRAMS IN**  
**BIOMEDICAL CHEMISTRY**  
**DEVELOPMENTAL BIOLOGY AND TERATOLOGY**  
**MICROBIOLOGY**  
**PHARMACOLOGY**  
**PUBLIC HEALTH**

**THE THESIS GUIDELINES**  
**PROCEDURES FOR COMPLETION AND**  
**PRESENTATION**

**MAY 1, 2005**

**THOMAS JEFFERSON UNIVERSITY**  
**COLLEGE OF GRADUATE STUDIES**

**PHILADELPHIA, PA 19107**

**215-503-5799**

# **THOMAS JEFFERSON UNIVERSITY**

## **COLLEGE OF GRADUATE STUDIES**

### **MASTER OF SCIENCE PROGRAMS IN**

#### **MICROBIOLOGY – BIOMEDICAL CHEMISTRY**

#### **PHARMACOLOGY – DEVELOPMENTAL BIOLOGY AND TERATOLOGY**

#### **PUBLIC HEALTH**

# **THESIS GUIDELINES**

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# Guidelines for Master of Science Research Thesis

The purpose of this Thesis Manual is to provide academic procedural guidelines for Master of Science students in the basic sciences at Thomas Jefferson University. Procedures for preparation and approval of the research proposal, committee meetings, writing of the thesis and the oral presentation of the Master's thesis are described.

## **DESCRIPTION**

Guided study and research in the basic sciences, under Graduate Faculty supervision. Written and oral presentation of thesis research is required.

## **PHILOSOPHY**

Students should have the knowledge and skills to contribute to the scientific validation of their practice. This requires a thorough understanding of the research process including: formulation of the objectives and specific aims of the research, literature review, proposal preparation, development and execution of a research plan, data interpretation, and presentation and dissemination of results in a journal quality paper.

## **OBJECTIVES**

The student will

- Identify a research advisor and members of the research committee
- Select an appropriate thesis topic for study
- Review the literature to determine if the objectives are reasonable and worth analysis
- Develop a research plan
- Submit a proposal explaining the question to be answered, the research plan, how the data will be analyzed, and listing the members of the research committee
- Execute the research plan
- Meet with the project advisor and full research committee (approximately twice annually) and prepare interim reports following the meetings
- Interpret the data
- Submit a rough draft of the research paper to research committee for approval
- Present approved research findings orally
- Submit a final journal quality research paper along with the signatures of the research committee's indicating completion of the research requirement

# THE RESEARCH COMMITTEE

## MEMBERSHIP OF THE RESEARCH COMMITTEE:

There are to be a **minimum of three persons on the committee. One of the members must be a member of the Graduate Faculty** of Thomas Jefferson University knowledgeable in the area of the thesis. The primary advisor may be a researcher at Thomas Jefferson University, a clinician with strong research interests, or a qualified scientist outside of the institution who has been approved by the Director. Advisors who are not on the Jefferson faculty must work in close communication with the Graduate Faculty member of the committee. In most cases, the primary advisor is the investigator directing the activities in the laboratory or department in which the student will be working on the thesis.

## PURPOSE OF THE RESEARCH COMMITTEE

The **purpose of the Research Committee** is to guide and advise the student in research. The primary advisor must be aware of the specific expertise that the proposed research committee members will contribute toward the student's scientific growth and development as well as the student's projected research activity. The primary advisor shall act as Chairperson of the committee. The proposed committee composition must have the necessary expertise in the area of the thesis and, simultaneously, must also be sufficiently representative of the faculty.

**Approval of the research proposal –  
the first official action of the committee.**

## THESIS PROPOSAL

The purpose of the proposal is to clearly and concisely answer the questions **WHAT, WHY, and HOW**. The proposal, by itself, should explain the purpose of the research and how the objectives will be accomplished. The proposal need not be more than two double-spaced typed pages in length. Format for the proposal is detailed on the following page.

## **Proposal Format**

### **Proposed Thesis Title**

This may be a provisional title, but should be sufficient to orient the research advisors to the student's proposed research.

### **Introduction or Definition of the Problem**

This section should answer the **WHAT** and **WHY**. It should describe the specific objectives of the research. It should establish the necessity of the research by summarizing the studies that have been done on the subject, the available information, and any deficiencies in this information. It should also relate the significance of the proposed research to the existing knowledge in the field.

### **Experimental Design and Scope**

This section should describe **HOW** the problem will be addressed. An individual reading the proposal should be able to determine whether the protocol design will adequately accomplish the project objective. The members of the research committee should be able to determine from this section whether the project is feasible with respect to time, resources, and expertise. The specific steps do not need to be described, but the type of procedure, materials, instruments, and method of evaluation should be clearly stated.

### **Bibliography**

A bibliography based on a current literature search should be included. Pertinent journal articles and reference texts should be cited, in the format of the premier journal in the field of study. A minimum of 10 references should be included.

**RESEARCH PROPOSAL APPROVAL FORM**

The attached Master's thesis proposal has been submitted by

\_\_\_\_\_  
(Type or print your name in the space above)

\_\_\_\_\_  
(Student Signature)

\_\_\_\_\_  
(Date)

a student in the Master of Science Program in

\_\_\_\_\_  
(Type or print the name of your program in the space above)

**The following persons** have agreed to serve as members of the Research Committee and have found that the student has sufficient knowledge in the field to proceed with the proposed study toward the completion of the Master's research thesis requirement.

**SIGNATURES OF RESEARCH COMMITTEE MEMBERS**

\_\_\_\_\_  
(Type or print name here)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Type or print name here)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Type or print name here)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Type or print name here)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

# RESPONSIBILITIES OF THE RESEARCH ADVISOR

- To assist in the development of the proposal for approval by the committee
- To ascertain adequacy of the literature search
- To assist the student in project design including necessary revisions
- To instruct, demonstrate, or make available to the student technologies, equipment, instrumentation, samples for testing, or laboratory space as needed for the completion of the project
- To guide the student in drawing conclusions and in the preparation of illustrations, graphic presentations, etc.
- To exercise the supervision necessary for the student to complete the project on schedule
- To collaborate with the members of the Research Committee in the final evaluation of the project

The Research Advisor is responsible for overseeing that an appropriate level of scholarship is exhibited by the thesis. The thesis must demonstrate a high degree of professional competence; it is the candidate's Research Committee that can give him or her the guidance and instruction necessary to achieve this necessary competence. The **Research Committee should meet regularly**, at least twice a year, to document progress during the student's period of research activity. Records of these meetings are submitted to the Director's office in the College of Graduate Studies and kept on file in the student's folder.

**RECORD OF RESEARCH COMMITTEE MEETING**

Student \_\_\_\_\_ Program \_\_\_\_\_

To the student:

- a) Complete the information requested below on a separate sheet of paper and attach it to this form. Type or computer-generate your report.
- b) Have the designated individuals sign in the appropriate places on this form and have your research advisor initial the attached sheet as well.
- c) Return this form, with the initialed attachment, to the College of Graduate Studies office, M-46 Jefferson Alumni Hall.

**MEETINGS OF THE RESEARCH COMMITTEE**

Full research committee meetings are to be held, at a minimum, twice annually. Following each meeting, present a one-page overview of your research progress to date and recommendations by your research committee members as to the future direction your research should take. Below, sign your name and have your research advisor and each member of your committee sign his or her name.

Date of Committee Meeting \_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Student Signature)

\_\_\_\_\_  
(Research Advisor's Signature)

**SIGNATURES OF RESEARCH COMMITTEE MEMBERS**

\_\_\_\_\_  
(Research Committee Member)

\_\_\_\_\_  
(Research Committee Member)

\_\_\_\_\_  
(Research Committee Member)

# RESEARCH THESIS FORMAT

The final thesis should incorporate all necessary changes and corrections stipulated by the Research Committee. **One bound copy** of the thesis, containing original photographs and illustrations, should be submitted to the College of Graduate Studies office, M-46 Jefferson Alumni Hall on the day of the thesis presentation. An unbound or bound copy of the final thesis should be given to each of the Research Committee members. All copy including footnotes, legends, figures, tables and bibliography should be typed double-spaced, on one side of 8.5" by 11" inch bond paper. Margins should be at least one inch on all sides.

The general format for manuscripts is as follows:

## TITLE PAGE

Include title, student's name, date, program and institutional affiliation, the name of the Research Advisor name and a listing of all Research Committee members.

## ABSTRACT

The abstract should briefly describe 1) the focus of research, 2) experimental design and methods of data collection, 3) summary of findings and 4) conclusions. The abstract should be limited to approximately 150 words.

## DEDICATION

Optional

## ACKNOWLEDGMENTS

This page expresses appreciation for all those who assisted the student and mentions any permission obtained to quote copyrighted material and any special funding.

## INTRODUCTION

States the objectives and aim of the research and relates the project work to existing knowledge on the subject. (Review of literature, statement of the problem)

## MATERIALS AND METHODS (EXPERIMENTAL DESIGN)

Expansion of the same section in the proposal. After reading this section a scientist should be able to duplicate your work.

## RESULTS

Present the collected data and its analysis

## DISCUSSION

Include data interpretation and conclusions drawn from your findings. The discussion should accurately reflect the project findings such as unexpected results, etc. and relate these findings to existing knowledge on the topic. Any difficulties encountered in the research or recommendations for further study should also be included.

## **BIBLIOGRAPHY OR LIST OF REFERENCES**

Every reference cited in the text must appear in the bibliography. Cite references in the format described in a formal writing style manual. The style for journal abbreviation is that used in current editions of the Index Medicus published by the National Library of Medicine. If the thesis is planned to be submitted for publication in a journal, the format required by that journal should be adhered to. This information (Information for Authors) is published annually by each journal.

# **RESEARCH THESIS EVALUATION**

The final research thesis will be evaluated by the research committee consisting of the primary advisor and at least two other persons; one member of the committee must always be a member of the Graduate Faculty of Thomas Jefferson University. Evaluation will be based on:

- Appropriateness of the research
- Adequacy of the literature search
- Organization and execution of the research plan
- Research scope and level of difficulty
- Validity of conclusions
- Quality and thoroughness of the written thesis
- Adherence to deadlines

# **SUBMISSION OF WRITTEN THESIS AND ORAL PRESENTATION**

A public research seminar is scheduled for the presentation of the thesis by the candidates for graduation. The candidate must demonstrate competence in his/her specific area of research through the oral presentation with accompanying graphics and the ability to answer questions pertaining to the study from those in attendance.

Presentations are scheduled twice each year: 1) Late in April/early in May for students who wish to graduate in June of that year. And 2) Early in August; students for whom this is the last requirement to complete their program will be invited to attend the graduation in June of the following year. They may have a letter from the Registrar indicating completing of all program requirement for the Master of Science degree in August.

- It is recommended that the student present a neatly typed “draft” copy of the thesis to the members of their Research Committee at least a month prior to the scheduled presentation dates. Photographs, graphs, illustrations, and tables need not be the originals for this final draft copy of the thesis but it must have sufficient content to allow the committee to determine if the student will be able to complete all the requirements prior to submitting an abstract for presentation.

- Only those students who have completed their thesis research and have had their rough draft of the thesis approved by their committee may apply to make the oral presentation.
- Approximately three weeks prior to the scheduled thesis presentations the student must submit an abstract of his/her study. The abstract is to be submitted on line using the following instructions.

## **GUIDELINES FOR PREPARING A THESIS PRESENTATION ABSTRACT**

Single-space all items. Use the Times 12-point font. Depending on your system, this font may be called “Times,” “TmsRmn,” or “Times New Roman.” Do not indent or otherwise format any part of the abstract.

### **Title Information**

- Capitalize the entire title.
- Give all authors’ names; use initials without periods for first and middle names, not full names.
- Underline the presenter’s name (your name).
- Use an asterisk (\*) to identify your faculty sponsor.
- Give departmental and institutional affiliations.
- See example on page 2.

### **Abstract Proper (Body of the Abstract)**

- Organize the body of the abstract in this fashion:  
 A statement of the study’s purpose (one sentence).  
 A statement of the methods used.  
 A summary of the results obtained, presented in sufficient detail to support your conclusions.  
 A statement of the conclusions reached. Note that it is NOT satisfactory to state, for example, that “the results will be discussed,” or that “other data will be presented.”
- The entire body of the abstract (that is, all the abstract except the Title Information) must be in a single paragraph. DO NOT separate “methods,” “results,” or “conclusions” into separate paragraphs. Figures and tables are not permitted in the abstract.
- See example on page 12.
- The ENTIRE abstract (Title Information and Abstract Proper) must fit into a space 4.5” wide and 7.0” deep when formatted with the 12 point Times font. If your material does not fit, you must shorten it. You MAY NOT use a smaller font or a different font. Instructions for obtaining a template are given below.

### **Submitting the Abstract**

Your abstract must be submitted as a computer file in Microsoft Word (any version) or as an ASCII text file. If you submit an ASCII text file, you must submit also a printed copy showing such formatting as subscripts, superscripts, and italics used for microbial genus and species names.

You may bring or mail the file on a 3.5" IBM-formatted diskette. You may also send the file as a file attachment to an e-mail directed to Eleanor.Gorman@jefferson.edu.

### **Obtaining a Thesis Presentation Abstract Template**

1. Send an e-mail to Eleanor.Gorman@jefferson.edu. In the "subject" line put the words "thesis abstract." You need not put anything in the body of the message. Ms. Gorman will reply to you and will attach a Microsoft Word template. The template will be called "ThesisAbstract.doc". The document will be set as "read only," which means that you can open the file but cannot modify it.
2. To work with the file, open it. Once it is open save it under a different name on your computer. In other words, use the File|Save As function from the toolbar. When prompted, give the file a new name. It will be saved on your computer without read/write restrictions. DO NOT change any settings on this file except for its name.
3. If you think you have done something to "ruin" your working copy of the template file, simply repeat No. 2 above to generate a new copy.
4. If you do not have e-mail, or if your e-mail server cannot handle attachments, bring a formatted 3.5" diskette to Rm M-46, Jefferson Alumni Hall. Ms. Gorman or someone else will copy the template onto your disk.

## **SAMPLE ABSTRACT**

**PREPARATION AND CHARACTERIZATION OF AN IMMUNOLIPOSOME SPECIFIC FOR TYPE II PNEUMOCYTES.** B Fenn, DS Strayer\*, Department of Molecular Pharmacology and Structural Biology, Thomas Jefferson University, Philadelphia PA.

Specific agents are necessary to target certain cell types and to minimize damage to healthy cells. Attempts have been made to attach ligands directly to the therapeutic agents. These ligands have included hormones, carbohydrates, lectins, receptor agonists and antagonists, as well as immunoglobulins. However, direct attachment often alters a drug's activity.

Immunoliposomes (ILs) may offer a means to circumvent some of these difficulties as prospective delivery vehicles for both drug and DAN molecules which may not enter cells by themselves. Herein is described an immunoliposome developed for use in type II pneumocytes. A2R, an anti-idiotypic antibody against the surfactant protein-A (SP-A) receptor on type II cells, was derivatized and coupled to liposomes consisting of phosphatidylcholine and cholesterol, carrying a  $\beta$ -galactosidase as a marker. Type II cells in primary cell culture were exposed either to these A2R-containing liposomes (A2R-ILs), to those immunoliposomes bearing non-specific rat IgG (IgG-ILs), or to comparable liposomes with no bound antibody. We found an  $\approx$  5-fold difference in binding between specific and non-specific ILs. In time-course experiments with A2R-ILs, 36.70% of cells showed transfer of the  $\beta$ -galactosidase. We tested whether pretreatment with SP-A would block the SP-A receptor and so alter the access of A2R-containing ILs to type II cells. The uptake of specific ILs was reduced to levels only slightly above background by pre-incubating cells with SP-A. Creation of this immunoliposome could facilitate future studies of pulmonary diseases and provide direction for therapeutic intervention.

**The final copy of the Research Thesis with the form on the next page, indicating successful completion of all the requirements for the written thesis signed by the members of the research committee must be submitted on the day of the presentation.**

**JEFFERSON COLLEGE OF GRADUATE STUDIES**  
**THOMAS JEFFERSON UNIVERSITY**  
**SIGNATURE SHEET**

Student \_\_\_\_\_

Candidate for the degree of

**Master of Science**

has successfully completed the final copy of the Master's research thesis in the field of

	Biomedical Chemistry
	Developmental Biology/Teratology
	Microbiology
	Pharmacology
	Public Health

We have found that the candidate has successfully completed the requirements for the Master of Science Research Thesis thereby demonstrating knowledge of the skills needed to contribute to the scientific validation of his or her practice.

Name

Date

\_\_\_\_\_  
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\_\_\_\_\_

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