

THESIS AND DISSERTATION  
GUIDELINES

VANDERBILT UNIVERSITY  
GRADUATE SCHOOL

## TABLE OF CONTENTS FOR GUIDELINES

	Page
MANUSCRIPT PREPARATION .....	4
Style .....	4
Composition and Structure .....	4
Dedication .....	5
Acknowledgment (and Acknowledgment of Support).....	5
Abstract .....	5
Title Page .....	5
Font.....	6
Margins .....	6
Pagination.....	6
Spacing.....	6
Numbering Schemes.....	7
Division .....	7
Body of Manuscript .....	7
Words and Sentences .....	7
Headings and Subheadings.....	7
Acronyms/Abbreviations/Capitalization.....	7
Tables and Figures .....	7
GENERAL INFORMATION .....	8
Language Other Than English .....	8
Multi-Part and Journal Article Format .....	8
Permission to Use Previously Published Material .....	8
Copyright .....	9
Publishing Agreements.....	10
Embargos.....	10
Extra Copies .....	11
THESIS & DISSERTATION SUBMISSION .....	11
Electronic Submission in VIREO .....	11
Master’s Thesis Requirements .....	12
Intent to Graduate OR Intra-term Application .....	12
Format Review.....	12
Title Page .....	12
Abstract .....	12
Completion of Master’s Degree Form .....	12
Ph.D. Dissertation Requirements .....	12

Intent to Graduate OR Intra-term Application .....	13
Defense Results .....	13
Format Review.....	13
Title Page (+ Extra Copy).....	13
Abstract .....	13
Survey of Earned Doctorates (SED) .....	13
Curriculum Vitae .....	13
FORMATTING SAMPLES .....	14
Margins Sample .....	14
Abstract Format .....	14
Abstract Sample.....	15
Title Page Format.....	16
Title Page Sample.....	17
Title Page Sample - ETD .....	18
Copyright Sample.....	19
Dedication Sample.....	20
Acknowledgements Sample.....	21
Table of Contents Format .....	22
Table of Contents Sample .....	23
List of Tables Sample .....	24
List of Figures Sample .....	25
Chapter 1, Page One Sample .....	26
Chapter 1, cont .....	27
Footnotes Sample .....	28
Figure Sample .....	29
References Sample .....	30
ACADEMIC PROGRAMS AND MAJORS.....	31

## MANUSCRIPT PREPARATION

These guidelines provide students at Vanderbilt University with essential information about how to prepare and submit theses and dissertations in a format acceptable to the Graduate School. The topics range from writing style to the completion of required forms. There are instructions and sample pages on the Graduate School website for guidance through this process.

### Style

There is a distinct difference between submitting a manuscript to a publisher and providing a completed thesis or dissertation to the Graduate School. A manuscript represents a pre-publication format; a thesis or dissertation is a final, completely edited, published document. Students should use these guidelines, not other style manuals, as the final authority on issues of format and style. Areas not covered in this document or deviation from any of the specifications should be discussed with a Graduate School format editor. Do not use previously accepted theses and dissertations as definite models for style.

### Composition and Structure

Manuscripts consist of four major sections and must be placed in the order listed:

#### **Preliminary Pages**

- Title Page (required)
- Copyright (optional, Ph.D. only)
- Dedication (optional)
- Acknowledgment (optional)
- Preface (optional)
- Table of Contents
- (required) List of Tables
- (required)
- List of Figures (required)
- List of Abbreviations/Nomenclature/Symbols (optional)

#### **Text**

- Introduction (may be referred to as Chapter 1)
- Body of Manuscript

#### **References**

(required)

#### **Appendices**

(optional)

## **Dedication**

The dedication is an optional portion of the academic manuscript. It is a personal message from the author in tribute to a person, group, or cause. Most dedications are brief statements beginning with “To...” or “For...” such as “To my family” or “For my daughter, Samantha.” The dedication, if any, is considered to be the sole work of the author and does not reflect endorsement of the views and opinions expressed therein by Vanderbilt University, the Graduate School, or the members of the faculty committee.

Sample: [Format Guidelines pg. 20](#); [Template](#)

## **Acknowledgment (and Acknowledgment of Support)**

The acknowledgment is another optional portion of the academic manuscript. It is appropriately used to thank those people and organizations that have helped or encouraged the author in the process of obtaining the degree or otherwise making the graduate degree possible: advisers, the committee, labmates or members of one’s cohort, family, friends, etc. Typically, an acknowledgment is no more than 1 page in length.

Acknowledgment of grant/contract or other financial support may be included on the acknowledgment page.

Similarly, permission to reprint copyrighted material may be included here.

The acknowledgment, if any, is considered to be the sole work of the author and does not reflect endorsement of the views and opinions expressed therein by Vanderbilt University, the Graduate School, or the members of the faculty committee.

Sample: [Format Guidelines pg. 21](#); [Template](#)

## **Abstract**

The abstract is a separate document from the manuscript; it is not bound with the thesis or dissertation. Abstracts must be printed on white, 8 ½ x 11-inch paper. No page numbers are printed on the abstract. One copy is required. Abstracts must have the original signature(s) of the faculty advisor(s). The minimum length of the thesis abstract is 250 words. The maximum length of the dissertation abstract is 350 words, including the dissertation title. Majors are listed on the last pages of these guidelines.

## **Title Page**

The title page must be printed on white, 8 ½ x 11-inch paper. Committee member signatures on the title page must be originals. Spacing on the title page will vary according to the length of the title. The five lines following your name must be formatted exactly as found on the sample title page. The title page is considered page ‘i’ but the page number is not printed on the page. **The month, day, and year representing the conferral date must be listed on the title page.**

## Font

Use a standard font consistently throughout the manuscript. Font size should be 10 to 12 points for all text, including titles and headings. It is permissible to change point size in tables, figures, captions, footnotes, and appendix material. Retain the same font, where possible. When charts, graphs, or spreadsheets are “imported,” it is permissible to use alternate fonts. Italics are appropriate for book and journal titles, foreign terms, and scientific terminology. **Boldface** may be used within the text for emphasis and/or for headings and subheadings. Use both in moderation.

## Margins

Measure the top margin from the edge of the page to the top of the first line of text. Measure the bottom page margin from the bottom of the last line of text to the bottom edge of the page. Page margins should be a minimum of one-half inch from top, bottom, left and right and a maximum of one inch from top, bottom, left and right. Right margins may be justified or ragged, depending upon departmental requirements or student preference.

## Pagination

The title page is considered to be page one, but the page number should not be printed on this page. All other pages should have a page number centered about ½ inch from the bottom of the page. Number the preliminary pages in lowercase Roman numerals. Arabic numerals begin on the first page of text. Pages are numbered consecutively throughout the remainder of the manuscript. The Introduction may be placed before the first page of Chapter 1, if it is not considered a chapter. The use of Arabic numbers may begin on the first page of the Introduction.

## Spacing

The entire text may be single-spaced, one and one-half spaced, or double-spaced. Block quotations, footnotes, endnotes, table and figure captions, titles longer than one line, and individual reference entries may be single-spaced. With spacing set, the following guidelines should be applied: Two enters after chapter numbers, chapter titles and major section titles (Dedication, Acknowledgements, Table of Contents, List of Tables, List of Figures, List of Abbreviations, Appendices, and References). Two enters before each first- level and second-level heading. Two enters before and after tables and figures embedded in the text. One enter after sub-level headings.

## Numbering Schemes

Chapters may be identified with uppercase Roman numerals or Arabic numbers. Styles used on the Table of Contents should be consistent within the text. Tables, figures, footnotes, and equations should be numbered consecutively throughout the manuscript with Arabic numerals. These may also be numbered consecutively by each chapter. Equation numbers should be placed to the right of the equation and contained within parentheses or brackets. Use uppercase letters to designate appendices.

## Division

### *Body of Manuscript*

Departments will determine acceptable standards for organizing master's theses into chapters, sections, or parts. Usually, if a thesis has headings, a Table of Contents should be included. The dissertation must be divided into chapters. The use of parts, in addition to chapters, is acceptable.

### *Words and Sentences*

Take care to divide words correctly. Do not divide words from one page to the next. Word processing software provides for "widow and orphan" protection. Utilize this feature to help in the proper division of sentences from one page to another. In general, a single line of text should not be left at the bottom or top of a page. Blank space may be left at the bottom of a page, where necessary.

### *Headings and Subheadings*

Use headings and subheadings to describe briefly the material in the section that follows. Be consistent with your choice of "levels" and refer to the instructions on spacing for proper spacing between headings, subheadings, and text. First-level headings must be listed on the Table of Contents. Second level and subsequent subheadings may be included.

### *Acronyms/Abbreviations/Capitalization*

Abbreviations on the title page should appear as they do in the body of the thesis or dissertation. (Examples: *Xenopus laevis*, Ca, Mg, Pb, Zn; TGF- $\beta$ , p53.) Capitalize only the first letter of words of importance, distinction, or emphasis in titles and headings. Do not alter the all-cap style used for acronyms (Example: AIDS) and organizational names (Example: IBM). Use the conventional style for Latin words (Examples: *in vitro*, *in vivo*, *in situ*). Genus and species should be italicized. Capitalize the first letter of the genus, but not that of the species name (Example: *Streptococcus aureus*).

## **Tables and Figures**

Figures commonly refer to photographs, images, maps, charts, graphs, and drawings. Tables generally list tabulated numerical data. These items should appear as close as possible to their first mention in the text. Tables and figures may be placed in appendices, if this is a departmental requirement or standard in the field. Tables and figures should be numbered with Arabic numerals, either consecutively or by chapter. **Be consistent** in the style used in the placement of tables and figure captions. Tables and figures may be embedded within the text or placed on a page alone. When placed on its own page, a figure or table may be centered on the page. When included with text, a table or figure should be set apart from the text. Tables and figures, including captions, may be oriented in landscape. Make sure to use landscape page positioning on landscape-oriented pages. Table data and figure data must be kept together if the information fits on one page.

## **GENERAL INFORMATION**

### **Language Other Than English**

Students in foreign language departments may submit manuscripts in a language other than English. The abstract, however, must be in English.

### **Multi-Part and Journal Article Format**

You may use a multi-part presentation format for combining original research that has been conducted in two or more related or non-related areas, or for presentation of combined journal articles (published or submitted for publication). You should organize the parts or articles into chapters, with well-defined subheadings, including an introduction, methods, results and discussion. Each chapter may contain its own list of references and appendices, or you may list them all at the end, depending on the custom of your discipline.

When using this format, the thesis or dissertation should nonetheless consist of an integrated argument that binds the chapters together. You should include the appropriate preliminary pages, an introduction presenting the general theme of the research, and a conclusion summarizing and integrating the major findings. Any additional appendices related to the dissertation as a whole or any general references from the introduction, conclusion or transitional sections should come at the end of the dissertation.

### **Permission to Include Your Own Previously Published or Co-Authored Material**

When you have previously published portions of your thesis or dissertation as an article or book chapter, you must ensure the work may also be published as part of the dissertation or thesis. The

standard provisions of copyright law [<https://researchguides.library.vanderbilt.edu/copyright>] regarding quoted and previously published material under copyright apply to the publication of theses and dissertations. Many publishers provide exceptions to work published as part of graduation requirements and this is often clearly outlined as part of the publication agreement signed by the author.

In order to include your own previously published or co-authored material in your thesis or dissertation, you must comply with the following:

1. You must be the first author, or obtain permission from your committee, to be uploaded as an Administrative file in Vireo.
2. The article must be based on research completed while you were enrolled at Vanderbilt University.
3. You must have permission from the publisher to reuse the work, which should be uploaded to Vireo as an Administrative file. The record of permission may take the form of the publishing agreement, a copy of the publisher's webpage describing reuse rights, or an email approval from the publisher. You should also identify which chapters are associated with which articles when prompted within Vireo.
4. If there are co-authors, you must obtain the permission of all co-authors to include the work in the thesis or dissertation both as a matter of copyright law and professional courtesy. Include these permission (email approval is acceptable) as an Administrative file in Vireo.
5. You must properly acknowledge previously published material and any co-authors within the text of your manuscript. This would typically take the form of a statement beneath the relevant chapter heading, such as "This chapter is adapted from [Title] published in [Journal] and has been reproduced with the permission of the publisher and my co-authors [List co-authors]" and include the full citation required by the publisher, if any, or appropriate to your discipline.

If the work is submitted to the ProQuest database, ProQuest will scan the document to ensure it contains no copyrighted material without consent and proper citation.

### **Inclusion of Third-Party Content in Your Dissertation; Copyright & Fair Use Issues**

If you are including content in your dissertation not authored or created by you, consider copyright issues. If your use of the content would exceed fair use under the Copyright Act, then you will need to seek the copyright holder's permission in order to use the material. Obtaining copyright permissions often takes time and should not be left until the last minute.

You should discuss questions about copyrighted material with your dissertation advisor or contact the VU Librarian for Copyright and Scholarly Communications at [disc@vanderbilt.edu](mailto:disc@vanderbilt.edu) for help evaluating fair use or obtaining permissions.

## **Copyright of Your Thesis or Dissertation**

Your thesis or dissertation is automatically protected by copyright as soon as it is fixed in a tangible form, such as being saved as an electronic file. Although not required, it is good practice to include the copyright symbol, your name, and the year on the title page of your work (© 2017 by [your name]).

You also may choose to register your copyright, which will gain you additional protections in case of litigation for copyright infringement. You can file a copyright registration online directly with the U.S. Copyright Office. The U.S. Copyright Office charges a fee of \$45.00.

## **Publishing Agreements**

You will be asked to agree to the license to deposit your submission to the Vanderbilt Institutional Repository. The Library, with the Vanderbilt Institutional Repository, enhances the metadata provided with your dissertation and adds your record to discovery tools like the Library Catalog and WorldCat, making it easily findable for scholars worldwide. The library also maintains the technical infrastructure of the repository. If you plan to make your dissertation open access, we can assist you in understanding the options for licensing. If your dissertation makes use of copyrighted content, you will want to think early on about whether you may rely on fair use or need to acquire licenses. We will be glad to meet with you to discuss the requirements of your particular project.

PhD students also have the option to request deposit of your submission with ProQuest, at no additional cost to you. If you elect to deposit your submission with ProQuest, you must also agree to the ProQuest license. This agreement is entirely between you and ProQuest. Vanderbilt's sole responsibility is to pass on the license agreement and your work to ProQuest. Please contact ProQuest Dissertation Publishing, at 1(800) 521-0600 or [dissspub@proquest.com](mailto:dissspub@proquest.com) with any questions.

## **Embargos**

The expectation of the Graduate School is that all theses and dissertations will be made publicly available absent these limited circumstances. You have the option to make your submission available immediately or to temporarily embargo its release for a limited period of time. Students may elect to embargo their work if they anticipate publication, are making a patent application, have restrictions imposed by sponsors, or privacy concerns. Metadata, including the abstract, about your submission will still be visible in the Vanderbilt Institutional Repository, thereby indicating that your submission was accepted. You should discuss any anticipated hold on publication with your advisor. If selecting the ProQuest publishing option, be sure that you make the same embargo selection under the Vanderbilt options. Once your submission has been released to ProQuest, we have no ability to retract it.

If, after consultation with your advisor, you would like to request a temporary embargo, you can elect

from the following:

- No embargo and release immediately for worldwide access
- Six (6) month embargo
- Twelve (12) month embargo
- Twenty-four (24) month embargo

If you, after consultation with your advisor, determine that you need to extend your embargo beyond your initial selection, you can only do so with permission from the Graduate School. If you have questions about your embargo, you may email [etdadmin@vanderbilt.edu](mailto:etdadmin@vanderbilt.edu)

### **Extra Copies**

The Graduate School recommends Campus Copy for procuring bound copies of theses and dissertations. You may contact them directly at 615-936-4544, or online at <https://printingservices.vanderbilt.edu>.

## **THESIS & DISSERTATION SUBMISSION**

Students or programs must submit all **signature** pages, including Defense Results, title page, abstract, and Completion of Master's Degree form, to the Graduate School. **All students** must complete either an Intent to Graduate or an Intra-Term Application. The Intent to Graduate is an online form accessed through YES. This form is to be completed by all students planning to graduate at the end of the Summer, Fall, or Spring Term. Student's planning to graduate on one of the Intra-Term dates should not complete the INTENT, but submit the Intra-Term Application to the Graduate School, making sure to complete both pages.

### **Electronic Submission in VIREO**

The Graduate School requires electronic submission of all theses and dissertations through VIREO, <http://vireo.library.vanderbilt.edu/>. Students will use their VUnet ID and password to log in and begin completing the appropriate information, as outlined below.

#### *Verify Your Information*

Name  
Orcid ID  
Department/Program, Degree, Major  
Phone & Address

### *License & Publication Agreements*

Vanderbilt License Agreement (Required)  
ProQuest Publication (Optional)

### *Document Information*

Title, degree month/year, Defense Date, Abstract, Keywords, Subjects, Language  
Your Committee, Chair email  
Previously Published Material (Optional)  
Embargo Options

### *Upload Your Files*

Primary Document: Thesis/Dissertation  
Additional Files: Supplemental, Source, Administrative (Abstract, Title Page, CV, SED certificate of completion)

### *Confirm and Submit*

Students will receive a confirmation email once submitted.

## **Master's Thesis Requirements**

### *Intent to Graduate OR Intra-term Application*

Students graduating at the end of the semester will complete the INTENT to Graduate, from their student profile in YES. Student graduating on one of the Intra-Term dates, will complete the Intra-Term Application and submit to the Graduate School by uploading it to their VIREO profile as an administrative file.

### *Format Review*

A format review is required before thesis approval. Review will take place through VIREO when you first upload your document. Allow time before the deadline for review and revisions. For questions or an in-person format review, contact [etdadmin@vanderbilt.edu](mailto:etdadmin@vanderbilt.edu).

### *Title Page*

Submit the title page, with signatures of your adviser and second reader. The date on the title page will reflect the month, day, and year of degree conferral. See example on page 16 (master's thesis candidates will, of course, only have two sign and date lines.)

### *Abstract*

Submit the abstract, with the signature of the advisor. See example on page 14. **Note:** please upload the signed title page followed by the signed abstract as one PDF, in VIREO.

### *Completion of Master's Degree Form*

Form must be completed and signed by the advisor and the DGS, then submitted securely by the program.

## Ph.D. Dissertation Requirements

### *Intent to Graduate OR Intra-term Application*

Students graduating at the end of the semester will complete the INTENT to Graduate from their student profile in YES. Students graduating on one of the Intra-Term dates will complete the Intra-Term Application and submit to the Graduate School by uploading the form to their VIREO profile as an administrative file.

### *Defense Results*

Students must schedule the Defense Exam with the Graduate School two weeks prior to the exam, and they or a member of their department or staff may submit the form through Redcap. The Defense Results form must be signed by the committee after the exam and uploaded securely via Redcap as soon as possible. *The signed title page and Abstract may be uploaded by the student to the student's VIREO profile as one PDF.*

### *Format Review*

A format review is required before dissertation approval. Review will take place through VIREO when you first upload your document. Allow time before the deadline for review and revisions. For questions contact [etdadmin@vanderbilt.edu](mailto:etdadmin@vanderbilt.edu).

### *Title Page*

Upload to VIREO the title page, with signatures of the committee members. The date on the title page will reflect the Month, day, year of degree conferral. See example on page 16.

### *Abstract*

Submit one copy of the abstract, with the signature of the advisor. See example on page 14.

### *Survey of Earned Doctorates (SED)*

Students finishing a doctorate degree are requested to complete the SED survey accessible at <https://sed-ncses.org>. Information provided to the National Opinion Research Council remains confidential and will be used for research or statistical purposes. Submit the Certificate of Completion with your VIREO submission as an administrative file.

### *Curriculum Vitae*

Submit your CV through your VIREO submission as an administrative file. Instructions on preparing a curriculum vitae are available at: [https://gradschool.vanderbilt.edu/forms/CV\\_requirement.pdf](https://gradschool.vanderbilt.edu/forms/CV_requirement.pdf).

## FORMATTING SAMPLES

## Margins Sample



**Minimum ½" Maximum 1" top margin  
(from top of page to top of first line text)**

**← Minimum ½" Maximum 1" left margin      Minimum ½" Maximum 1" right margin →**

**(Page numbers fall WITHIN the bottom margin and must be centered)**

**(From the bottom of the last line of text to the bottom of the page)**

**Minimum ½" Maximum 1" bottom margin**



**Abstract Format**

**MAJOR**

**(All caps, underlined, right justified, one inch from top of page. DO NOT precede Program name with the words "Department of").**

**(Set line spacing to double spacing after Title)**

**Final title of dissertation, upper/lower case, single-spaced, centered**

**Your name, upper/lower case, centered**

**Dissertation (or Thesis) under the direction of Professor (Full Name)  
(Underlined, centered, upper/lower case, double space to text, no page numbers)**

**TEXT**

**(Double spaced)**

**Approved** \_\_\_\_\_  
**Type full name of Dissertation (or Thesis) director**

**Date** \_\_\_\_\_

Strain-Specific Alleles of *Phox2B* Differentially  
Modify *Sox10<sup>Dom</sup>* Aganglionosis

Lauren Colleen Walters

Dissertation under the direction of Professor E. Michelle Southard-Smith

Hirschsprung disease (HSCR) is characterized by a lack of enteric ganglia in a variable portion of the distal bowel. The complex inheritance pattern of this disorder has led researchers to focus on genetic effects other than the putative disease mutation. Mouse models provide a controlled background for these types of studies. *Sox10* is an essential gene for the development of the enteric nervous system (ENS). *Sox10<sup>Dom</sup>* mice on a mixed genetic background exhibit the variable aganglionosis seen in HSCR cases. Congenic lines of *Sox10<sup>Dom</sup>* mice on distinct inbred genetic backgrounds, C57BL/6J (B6) and C3HeB/FeJ (C3Fe), differ in penetrance and extent of aganglionosis. A linkage screen for modifiers of *Sox10<sup>Dom</sup>* aganglionosis was undertaken in a large B6 X C3Fe F<sub>2</sub> population. Several potential modifier regions were identified, with the most significant located on chromosome five (*Sox10m3*). The most relevant candidate gene in this region was *Phox2B*, an essential factor in autonomic neurogenesis.

Approved \_\_\_\_\_ Date \_\_\_\_\_

E. Michelle Southard-Smith, Ph.D.

Title Page Format

**Title of dissertation, upper/lower case, single-spaced, centered  
(One inch from top of page to top of title)**

**(Spacing will vary depending on length of the title of thesis or dissertation)**

**By**

**Your Name**

**(The following five lines must be included in this exact format)**

**Dissertation (or Thesis)**

**Submitted to the Faculty of the**

**Graduate School of Vanderbilt University**

**in partial fulfillment of the requirements**

**for the degree of**

**DOCTOR OF PHILOSOPHY**

**in**

**Major**

**Month, Day, Year**

**\*IMPORTANT: The date will reflect your proposed degree conferral date as selected from the Intent to Graduate form. This is your actual GRADUATION date, not your thesis or defense date.**

**Nashville, Tennessee**

**Approved: (Original signatures of committee members)**

**Date:**

\_\_\_\_\_  
**(Typed member's full name under each signature line)**

\_\_\_\_\_  
**(Typed member's full name under each signature line)**

\_\_\_\_\_  
**(Typed member's full name under each signature line)**

\_\_\_\_\_  
**(Typed member's full name under each signature line)**

\_\_\_\_\_  
**(Typed member's full name under each signature line)**

**(Title Page carries the value of page "1", but do not print number on page)**

**Mechanisms of Antibiotic Resistance  
and Pathogenesis in *Acinetobacter baumannii***

**By**

**Marguerite Indriati Hood**

**Dissertation**

**Submitted to the Faculty of the  
Graduate School of Vanderbilt University  
in partial fulfillment of the requirements**

**for the degree of**

**DOCTOR OF PHILOSOPHY**

**in**

**Microbiology and Immunology**

**August 31, 2017**

**Nashville, Tennessee**

**Approved:**

**Date:**

\_\_\_\_\_  
**Timothy L. Cover, M.D.**

\_\_\_\_\_  
**Dean W. Ballard, Ph.D.**

\_\_\_\_\_  
**Timothy S. Blackwell, M.D.**

\_\_\_\_\_  
**Terence S. Dermody, M.D.**

\_\_\_\_\_  
**Eric P. Skaar, Ph.D.**

**(Title Page carries the value of page "i", but do not print number on the page)**

Title Page Sample – ETD – (*this is the format you must use for first page of primary document*)

**Mechanisms of Antibiotic Resistance  
and Pathogenesis in *Acinetobacter baumannii***

**By**

**Marguerite Indriati Hood**

**Dissertation**

**Submitted to the Faculty of the**

**Graduate School of Vanderbilt University**

**in partial fulfillment of the requirements**

**for the degree of**

**DOCTOR OF PHILOSOPHY**

**in**

**Microbiology and Immunology**

**August 31, 2017**

**Nashville, Tennessee**

**Approved:**

**Timothy L. Cover, M.D.**

**Dean W. Ballard, Ph.D.**

**Timothy S. Blackwell, M.D.**

**Terence S. Dermody, M.D.**

**Eric P. Skaar, Ph.D.**

**(Title Page carries the value of page “1”, but do not print number on the page)**

**Copyright Sample**

**Copyright © 2014 by Clinton Cody Bertram  
All Rights Reserved**

**Dedication Sample**

**To my amazing daughters, Megan and Alisha, wise beyond their years**

**and**

**To my beloved husband, Jonathan, infinitely supportive**

**If no Copyright page, begin printing page numbers here, using lower case Roman numerals and continue consecutive Roman numeral numbering throughout the preliminary pages.**

## ACKNOWLEDGEMENTS

**This work would not have been possible without the financial support of the Vanderbilt Physician Scientist Development Award, the American Roentgen Ray Society Scholarship or the Vanderbilt University Medical Center Department of Radiology and Radiological Sciences. I am especially indebted to Dr. Martin Sandler, Chairman of the Department of Radiology, and Dr. John Worrell, Chief of the Section of Thoracic Radiology, who have been supportive of my career goals and who worked actively to provide me with the protected academic time to pursue those goals.**

**I am grateful to all of those with whom I have had the pleasure to work during this and other related projects. Each of the members of my Dissertation Committee has provided me extensive personal and professional guidance and taught me a great deal about both scientific research and life in general. I would especially like to thank Dr. Ron Price, the chairman of my committee. As my teacher and mentor, he has taught me more than I could ever give him credit for here. He has shown me, by his example, what a good scientist (and person) should be.**

**Nobody has been more important to me in the pursuit of this project than the members of my family. I would like to thank my parents, whose love and guidance are with me in whatever I pursue. They are the ultimate role models. Most importantly, I wish to thank my loving and supportive wife, Jennifer, and my three wonderful children, Lauren, Jacob and Elizabeth, who provide unending inspiration.**

**TABLE OF CONTENTS**

	Page
<b>DEDICATION.....</b>	<b>iii</b>
<b>ACKNOWLEDGEMENTS .....</b>	<b>iv</b>
<b>LIST OF TABLES.....</b>	<b>vii</b>
<b>LIST OF FIGURES.....</b>	<b>ix</b>
<b>LIST OF ABBREVIATIONS.....</b>	<b>x</b>
<b>Chapter</b>	
<b>I. Title of Chapter I .....</b>	<b>1</b>
<b>First level heading one (upper/lower case) .....</b>	<b>1</b>
<b>First level heading two .....</b>	<b>3</b>
<b>First level heading three.....</b>	<b>6</b>
<b>Second level subheading one (upper/lower case) .....</b>	<b>8</b>
<b>Second level subheading two .....</b>	<b>10</b>
<b>First level heading four .....</b>	<b>15</b>
<b>First level heading five.....</b>	<b>17</b>
<b>II. Title of Chapter II .....</b>	<b>20</b>
<b>First level heading one (upper/lower case).....</b>	<b>20</b>
<b>Second level subheading one (upper/lower case) .....</b>	<b>23</b>
<b>Second level subheading two .....</b>	<b>25</b>
<b>First level heading two .....</b>	<b>28</b>
<b>First level heading three.....</b>	<b>30</b>
<b>Appendix</b>	
<b>A. Title of First Appendix.....</b>	<b>125</b>
<b>B. Title of Second Appendix.....</b>	<b>137</b>
<b>C. Title of Third Appendix .....</b>	<b>143</b>
<b>REFERENCES.....</b>	<b>149</b>

## TABLE OF CONTENTS

	Page
<b>ACKNOWLEDGEMENTS</b> .....	<b>iv</b>
<b>LIST OF TABLES</b> .....	<b>vii</b>
<b>ABBREVIATIONS</b> .....	<b>xiii</b>
<b>Chapter</b>	
<b>I. Introduction</b> .....	<b>1</b>
<b>Ferromagnetic Nanoparticles: Theory and Synthesis Strategies</b> .....	<b>5</b>
<b>The Direct Formic Acid Fuel Cell</b> .....	<b>11</b>
<b>Ultra-Hard Late-Transition Metal Borides</b> .....	<b>14</b>
<b>II. Direct Synthesis and Size Selection of Ferromagnetic Iron Platinum Nanoparticles</b> .....	<b>19</b>
<b>Introduction</b> .....	<b>19</b>
<b>Experimental</b> .....	<b>20</b>
<b>Results and Discussion</b> .....	<b>23</b>
<b>Conclusion</b> .....	<b>35</b>
<b>III. Direct Synthesis and Characterization of Iron Palladium and Cobalt Platinum Nanoparticles</b> .....	<b>37</b>
<b>Introduction</b> .....	<b>37</b>
<b>Experimental</b> .....	<b>38</b>
<b>Results and Discussion</b> .....	<b>49</b>
<b>Conclusion</b> .....	<b>52</b>
<b>IV. Microwave Synthesis of Palladium Carbon Nanocomposites and Their Formic Oxidation</b>	
<b>Catalytic Performance</b> .....	<b>54</b>
<b>Introduction</b> .....	<b>54</b>
<b>Experimental</b> .....	<b>57</b>
<b>Results and Discussion</b> .....	<b>87</b>
<b>Conclusion</b> .....	<b>96</b>
<b>Appendix</b>	
<b>A. Lithium Intercalation of Vanadium(V) Oxide</b> .....	<b>99</b>
<b>B. Synthesis and Characterization of Palladium Bismuth, Palladium Lead, Nanocomposites for Formic Acid Oxidation</b> .....	<b>103</b>
<b>REFERENCES</b> .....	<b>121</b>

**LIST OF TABLES**

<b>Table</b>	<b>Page</b>
<b>1. Process Hazard Analysis (PHA) Techniques—Basic Information .....</b>	<b>38</b>
<b>2. Safety Hazard Analysis Techniques—Basic Information.....</b>	<b>42</b>
<b>3. Comparison of Hazard Analysis Techniques—Strengths and Weaknesses .....</b>	<b>43</b>
<b>4. Selected Human Health Risk Assessment Techniques—Basic Information.....</b>	<b>53</b>
<b>5. Selected Health Risk Assessment Techniques—Strengths and Weaknesses .....</b>	<b>54</b>
<b>6. Distinguishing Characteristics of Point Estimate and Probabilistic Human Health Risk Assessment Methods.....</b>	<b>62</b>
<b>7. Selected Human Health Risk Assessment and Risk Management Methodologies .....</b>	<b>65</b>
<b>8. Example Risk Assessment Matrix from Brown et al. (2005).....</b>	<b>115</b>
<b>9. Baseline Risks for SDA Human Health Contaminants of Potential Concern .....</b>	<b>151</b>
<b>10. Baseline Risks for BCBG Residential Contaminants of Potential Concern .....</b>	<b>156</b>
<b>11. Possible Subsurface Disposal Area (SDA) Disposition Alternatives .....</b>	<b>171</b>
<b>12. General Process Steps Needed to Disposition DOE Buried Wastes .....</b>	<b>175</b>
<b>13. Hazard Evaluation for Manage-in-Place Alternative, No Action Option (1A) .....</b>	<b>186</b>
<b>14. Gap Analysis for Manage-in-Place Alternative, No Action Option (1A) .....</b>	<b>191</b>
<b>15. Summary of the Most Important Human Health Risks and Knowledge Gaps for the SDA Remedial Alternatives .....</b>	<b>203</b>
<b>16. Possible Bear Creek Burial Grounds (BCBG) Disposition Alternatives.....</b>	<b>215</b>
<b>17. Process Steps Needed to Disposition (BCBG) Buried Wastes .....</b>	<b>216</b>
<b>18. Hazard Evaluation for Manage-in-Place Alternative, No Action Option (1A) .....</b>	<b>222</b>
<b>19. Gap Analysis for Manage-in-Place Alternative, No Action Option (1A) .....</b>	<b>227</b>

LIST OF FIGURES

Figure	Page
1. Oviposition sites and resulting fruit shapes for flowers pollinated by <i>Tegeticula cassandra</i> and <i>t. yuccasella</i> .....	12
2. Survivorship results for <i>Tegeticula Cassandra</i> and <i>T. yuccasella</i> .....	21
3. Example of differences in vapor pressure over time for the three flower.....	23
4. Distribution of the pollinator <i>Tegeticula elatella</i> and the cheater <i>T. intermedia</i> the United States .....	39
5. Maximum likelihood tree for the <i>Tegeticula elatella</i> , <i>T. intermedia</i> mitochondrial DNA haplotypes .....	45
6. Likelihood scores calculated from AFLP data for <i>Tegeticula elatella</i> , <i>T. intermedia</i> , and individuals from the Big Bend population .....	47
7. Site locations for <i>Tegeticula intermedia</i> and <i>T. Cassandra</i> in the United States .....	61
8. Hypothetical scenario for the evolution of cheating in the <i>Tegeticula intermedia</i> <i>T. Cassandra</i> lineage .....	62
9. Maximum-likelihood tree for <i>Tegeticula intermedia</i> and <i>T. Cassandra</i> mitochondrial DNA haplotypes .....	71
10. Mitochondrial DNA haplotype network for <i>Tegeticula intermedia</i> .....	72
11. Mitochondrial DNA haplotype network for <i>Tegeticula cassandra</i> .....	73
12. Isolation by distance results for <i>Tegeticula intermedia</i> and <i>T. cassandra</i> .....	75
13. Mismatch distributions for <i>Tegeticula intermedia</i> and <i>T. cassandra</i> .....	76
14. Posterior distributions of migration for <i>Tegeticula intermedia</i> and <i>T. cassandra</i> .....	78

**CHAPTER I**

**TITLE OF CHAPTER**

**First-Level Heading**

**Begin each chapter at the top of a new page. Follow the chapter number and chapter title with the same amount of space (line and one-half, double space, or “two enters, with spacing set to double space”). Use this same amount of space to precede first -and second- level headings, and before and after figures and tables.**

**Second-Level Heading**

**The number of levels and the placement of the headings and subheadings will vary, dependent on departmental requirements or preference. Headings may be centered, left justified, in bold face, italicized, indented or numbered. Use the same style throughout the document.**

**Be consistent with spacing and heading styles.**

**(Begin the use of Arabic numbering on the first page of text. Continue consecutive Arabic page numbering throughout the remainder of the document, including the appendices and references)**

## CHAPTER 1

### INTRODUCTION

**Most children develop spatial concepts by looking at their environment and moving through their surroundings (Long & Hill, 2000). Children who are blind are unable to visually learn about their environment and are often delayed in the motor skills necessary to explore their environment (Adelson & Fraiberg, 1974; Jan, Sykanda, & Groenveld, 1990; Palazes, 1986). Despite these delays, children who are blind are able to develop and use cognitive maps of spatial relationships though not necessary following the same pattern as children with typical sight (see literature review).**

**First, key terms are defined and the impact of blindness on cognitive mapping is discussed. Next, a historical perspective on cognitive mapping in children with visual impairments is provided. Then, methods of measuring cognitive mapping are presented, and the importance of studying cognitive mapping abilities in children is discussed. Finally, research questions are presented.**

#### **Definitions and Impact of Blindness on Cognitive Mapping**

##### **Definitions**

**Cognitive mapping – a psychological process in which one “acquires, codes, stores, recalls, and decodes information about the relative locations and attributes of phenomena in his every day, spatial environment” (Downs & Stea, 1973, p. 9).**

## Footnotes Sample

Once again when he reminds us of Thomas S. Kuhn's work on paradigms: "But as Thomas S. Kuhn has stated in the *Structure of Scientific Revolutions*, theory often follows rather than precedes the practical 'shift in paradigm' that he regards as constituting a revolution in most research disciplines."<sup>95</sup> Perhaps the practice of a new paradigm is coming into place with the theory to follow. Perhaps we as historians of ancient Israel should acknowledge an axiom of philosopher of history, Michael Stanford,

It is therefore not a weakness of history that it generates unending debates. Therefore, history is to be seen not as a set of cast-iron facts, but rather as an ongoing conversation with one's fellows about affairs of importance or interest – past, present or future. The discussion can at times become debate, or fierce argument...History is not a concept but an activity – an activity of a unique kind...History is...best understood as an endless debate, constituting an important part of the continuing conversation of mankind [sic].<sup>96</sup>

Contemporary historians then continue to press forward by contemplating increasingly complex questions. Perhaps it is in conversation with the broader discipline of history and philosophy of history that historians of ancient Israel will find acceptable foundations for a new paradigm.<sup>97</sup> Historiography in general, and historiography of ancient Israel specifically, finds itself at an extended crossroad, in need of an agreed-upon historiographic framework. In establishing this framework, the discipline must acknowledge the tradition upon which it stands; it must acknowledge the corrective challenges that have and continue to modify that tradition; it must push that tradition to ask itself challenging questions; it must reformulate itself to meet its current "depression + conduct disorder but do not have ADHD". This is a more accurate representation of the presentation clinicians must deal with in community settings. Finding "pure" examples of a single diagnosis is uncommon. Therefore, in the current study, a child was listed as having a diagnosis if he/she met the criteria for that diagnosis and regardless of the other diagnoses for which he/she might have qualified.

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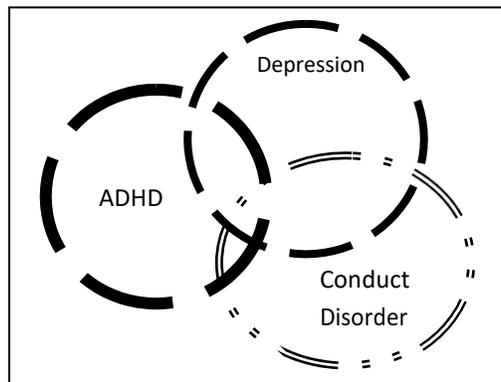
<sup>95</sup> Dever, 69, discussing Thomas S. Kuhn, *The Structure of Scientific Revolutions* (3<sup>rd</sup> ed.; Chicago: University of Chicago Press, 1996).

<sup>96</sup> Stanford, *An Introduction to the Philosophy of History*, preface, viii.

<sup>97</sup> As already suggested by Long, "The Future of Israel's Past," *passim* and Halpern, *The First Historians*, *passim*.

## Figure Sample

**“depression + conduct disorder but do not have ADHD”. This is a more accurate representation of the presentation clinicians must deal with in community settings. Finding “pure” examples of a single diagnosis is uncommon. Therefore, in the current study, a child was listed as having a diagnosis if he/she met the criteria for that diagnosis and regardless of the other diagnoses for which he/she might have qualified.**



**Figure 2. Venn Diagram of Co-Morbid Disorders**

**In addition to the PCAS diagnoses, Internalizing and Externalizing scores from the Child Behavior Checklist were used as indicators of “broadband-specific features” (Weiss, Susser, & Catron, 1998) rather than the narrowband-specific features represented by specific diagnostic categories. Measures of Internalizing and Externalizing behaviors function as indicators of what the parent/surrogate views as the primary problem. T scores for these two scales were used in analyses. These T scores reflect the deviation of all subjects from the mean of their respective normative (age and gender) groups in the same fashion without losing any statistical power (Achenbach, 1991).**

REFERENCES

- Able, S. and Ungewickell, E. (1990) Auxilin, a newly identified clathrin-associated Protein in coated Vesicles from bovine brain. *J Cell Biol*, 111, 19-29.**
- Bartels, C., Xia, T., Billeter, M., Guntert, P. and Wuthrich, K. (1995) The program XEASY for computer-supported NMR spectral analysis of biological macromolecules. *J Biol NMR*, 1-10.**
- Bashford, D. and Case, D.A. (2000) Generalized born models of macromolecular solvation effects. *Annu Rev Phys Chem*, 51, 129-152.**
- Bayer, P., Arndt, A., Metzger, S., Mahajan, R., Melchior, F., Jaenicke, r. and Becker, J. (1998) structure determination of the small ubiquitin-related modified SUMO-1. *J Mol Biol*, 280, 275-286.**
- Beal, R., Deveraux, O., Xia, G., Rechsteiner, M. and Pickart, C. (1996) Surface hydrophobic residues of multiubiquitin chains essential for proteolytic targeting. *Proc Natl Acad Sci U S A*, 93, 861-866.**
- Bertolaet, B.L., Clarke, D.J., Wolff, M., Watson, M.H., Henze, M., Divita, G. and Reed, S.I. (2001a) UBA domains mediate protein-protein interactions between two DNA damage-inducible proteins. *J Mol Biol*, 313, 955-963.**
- Bertolaet, B.L., Clarke, D.J., Wolff, M., Watson, M.H., Henze, M., Divita, G. and Reed, S.I. (2001b) UBA domains of DNA damage-inducible proteins interact with ubiquitin. *Nat Struct Biol*, 8, 417-422.**
- Biederer, T., Volkwein, C. and Sommer, T. (1997) Role of Cue1p in ubiquitination and degradation at the ER surface. *Science*, 278, 1806-1809.**
- Bodehausen, G. and Ruben, D.J. (1980) Natural abundance nitrogen-15 NMR by enhanced heteronuclear spectroscopy. *Chemical Physics Letters*, 69, 185-189.**
- Bonifacino, J.S. and Traub, L.M. (2003) Signals for Sorting of Transmembrane Proteins to Endosomes and Lysosomes. *Annu Rev Biochem*, 72, 395-447.**
- Braunschweiler, L. and Ernest, R.R. (1983) Coherence transfer by isotropic mixing: Application to proton correlation spectroscopy. *Journal of Magnetic Resonance*, 53, 521-528.**
- Buchberger, A. (2002) From UBA to UBX: new words in the ubiquitin vocabulary *Trends Cell Biol*, 12, 216-221.**

## ACADEMIC PROGRAMS AND MAJORS

**Majors listed in middle column below must be used on Title Page and Abstract**

<b><u>Academic Program</u></b>	<b><u>Major (To be reflected on title page)</u></b>	<b><u>Degrees</u></b>	
Anthropology	Anthropology	MA	PhD
Astrophysics	Astrophysics	MA	PhD
Biochemistry	Biochemistry	MS	PhD
Biological Sciences	Biological Sciences	MS	PhD
Biomedical Engineering	Biomedical Engineering	MS	PhD
Biomedical Informatics	Biomedical Informatics	MS	PhD
Biomedical Sciences	Biomedical Sciences	MS	
Biostatistics	Biostatistics	MS	PhD
Cancer Biology	Cancer Biology	MS	PhD
Cell & Developmental Biology	Cell & Developmental Biology		PhD
Chemical & Biomolecular Engineering	Chemical Engineering	MS	PhD
Chemical & Physical Biology	Chemical & Physical Biology		PhD
Chemistry	Chemistry	MS	PhD
Classical and Mediterranean Studies	Classics	MA	
Civil Engineering	Civil Engineering	MS	PhD
Community Research & Action	Community Research & Action	MS	PhD
Comparative Media Analysis and Practice	<Major> and Comparative Media Analysis		PhD
Computer Science	Computer Science	MS	PhD
Creative Writing	Creative Writing	MFA	
Data Science	Data Science	MS	
Drug Discovery (4+1)	Drug Discovery	MS	
Earth & Environmental Sciences	Earth & Environmental Sciences	MS	PhD
Economic Development	Economics	MA	
Economics	Economics	MA	PhD
Electrical Engineering	Electrical Engineering	MS	PhD
English	English	MA	PhD
Environmental Engineering	Environmental Engineering	MS	PhD
Epidemiology	Epidemiology		PhD
French & Italian	French	MA	PhD
Germanic, Russian & East. European Studies	German	MA	PhD
Hearing & Speech Sciences	Hearing & Speech Sciences		PhD
History	History	MA	PhD
History of Art (4+1)	History of Art	MA	
Human Genetics	Human Genetics		PhD
Interdisciplinary Studies	Interdisciplinary Studies: <Major>	MA, MS	PhD
Interdisciplinary Materials Science	Interdisciplinary Materials Science	MS	PhD
Latin American Studies	Latin American Studies	MA	
Law & Economics	Law & Economics		PhD

<b>Leadership &amp; Policy Studies</b>	<b>Leadership &amp; Policy Studies</b>		<b>PhD</b>
<b>Learning, Teaching &amp; Diversity</b>	<b>Learning, Teaching &amp; Diversity</b>	<b>MS</b>	<b>PhD</b>
<b>Liberal Arts and Science</b>	<b>Liberal Arts and Science</b>	<b>MLAS</b>	
<b>Mathematics</b>	<b>Mathematics</b>	<b>MA</b>	<b>PhD</b>
<b>Mechanical Engineering</b>	<b>Mechanical Engineering</b>	<b>MS</b>	<b>PhD</b>
<b>Medicine, Health &amp; Society</b>	<b>Medicine, Health &amp; Society</b>	<b>MA</b>	
<b>Microbe-Host Interactions</b>	<b>Microbe-Host Interactions</b>	<b>MS</b>	<b>PhD</b>
<b>Molecular Pathology &amp; Immunology</b>	<b>Molecular Pathology &amp; Immunology</b>	<b>MS</b>	<b>PhD</b>
<b>Molecular Physiology &amp; Biophysics</b>	<b>Molecular Physiology &amp; Biophysics</b>	<b>MS</b>	<b>PhD</b>
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