INSTRUCTIONS FOR PREPARATION & SUBMISSION OF ELECTRONIC THESES, DISSERTATIONS and DISSERTATION ABSTRACTS

The University of Texas Health Science Center at San Antonio
Graduate School of Biomedical Sciences
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Table of Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. GENERAL INSTRUCTIONS</td>
<td>1</td>
</tr>
<tr>
<td>A. Required Bound Copies</td>
<td>1</td>
</tr>
<tr>
<td>B. Paper</td>
<td>1</td>
</tr>
<tr>
<td>C. Typing</td>
<td>2</td>
</tr>
<tr>
<td>D. Margins</td>
<td>2</td>
</tr>
<tr>
<td>E. Abbreviations</td>
<td>2</td>
</tr>
<tr>
<td>F. Guidelines for Publishing Electronically</td>
<td>2</td>
</tr>
<tr>
<td>G. Use of Copyrighted Material</td>
<td>2</td>
</tr>
<tr>
<td>H. Microfilming, Electronic Publishing and Abstract Publication</td>
<td>3</td>
</tr>
<tr>
<td>I. Publishing Agreement and Registration for Copyright of the Dissertation /Thesis</td>
<td>3</td>
</tr>
<tr>
<td>II. NUMBERING OF PAGES</td>
<td>4</td>
</tr>
<tr>
<td>A. Preliminares</td>
<td>4</td>
</tr>
<tr>
<td>B. All Other Sections</td>
<td>4</td>
</tr>
<tr>
<td>C. Location of Page Numbers</td>
<td>4</td>
</tr>
<tr>
<td>III. ORGANIZATION OF CONTENTS</td>
<td>5</td>
</tr>
<tr>
<td>A. Sequential Order</td>
<td>5</td>
</tr>
<tr>
<td>B. Table of Contents and Page Arrangement</td>
<td>5</td>
</tr>
<tr>
<td>1. The preliminary pages</td>
<td>5</td>
</tr>
<tr>
<td>2. The text pages</td>
<td>6</td>
</tr>
<tr>
<td>3. The supplementary pages</td>
<td>7</td>
</tr>
<tr>
<td>IV. PRELIMINARY SECTIONS</td>
<td>9</td>
</tr>
<tr>
<td>A. Fly Page</td>
<td>9</td>
</tr>
<tr>
<td>B. Title Page</td>
<td>9</td>
</tr>
<tr>
<td>C. Copyright Notice Page</td>
<td>9</td>
</tr>
<tr>
<td>D. Approval Page</td>
<td>9</td>
</tr>
<tr>
<td>E. Dedication Page</td>
<td>10</td>
</tr>
<tr>
<td>F. Preface or Acknowledgement Page(s)</td>
<td>10</td>
</tr>
<tr>
<td>G. Abstract</td>
<td>10</td>
</tr>
<tr>
<td>1. Content</td>
<td>10</td>
</tr>
<tr>
<td>2. Requisite copies</td>
<td>10</td>
</tr>
<tr>
<td>a. Distribution with announcement of final oral examination</td>
<td>10</td>
</tr>
<tr>
<td>H. Table of Contents</td>
<td>10</td>
</tr>
<tr>
<td>I. List of Tables, List of Figures, List of Plates</td>
<td>10</td>
</tr>
</tbody>
</table>
V. TEXT-ASSOCIATED COMPONENTS ................................................................. 11
   A. Tables ................................................................................................. 11
   B. Figures ............................................................................................... 11
   C. Plates .................................................................................................. 12
   D. Quotations .......................................................................................... 13
   E. Footnotes ............................................................................................ 13

VI. SUPPLEMENTARY SECTIONS ................................................................. 14
   A. Appendix ............................................................................................. 14
   B. List of Abbreviations .......................................................................... 14
   C. Literature Cited .................................................................................. 14
      1. Procedures for citation .................................................................. 14
      2. Specific citations ............................................................................ 15
         a. Journal articles ........................................................................... 15
         b. Other types of citations ............................................................. 16
   D. Vita ..................................................................................................... 16

VII. OPTIONAL FORMAT FOR PREPARATION OF DISSERTATIONS ..........17

VIII. SUBMISSION OF THE THESIS/DISSERTATION DRAFTS .................20

IX. GUIDELINES FOR PLANNING YOUR GRADUATION .......................21
   A. Actions required for Ph.D. Candidates .............................................21
   B. Actions required for M.S. and M.S.N. Candidates .........................23

X. BINDING OF THE THESIS/DISSERTATION .........................................25

APPENDIX ....................................................................................................1A - 6A
I. GENERAL INSTRUCTIONS

“A successful dissertation is a demonstration of the candidate’s ability to use the tools and methods of research in the field, to organize the findings, and to report them in a mature, literate, and lucid fashion.”

From Requirements for the Ph.D., published by the Council of Graduate Schools in the United States, April, 1979

Your thesis/dissertation represents public presentation of your contribution to knowledge in your scientific field. Since its contents will reflect your competence, attainments and potential as a scientific investigator, you should construct this manuscript with great care and concern, so that it truly represents the highest quality of your research activities over the period of your graduate training.

The guidelines on the following pages are designed primarily to aid you in preparing a thesis/dissertation which will be informative and well organized, and will demonstrate your ability to communicate effectively. It should be free of grammatical and typographical errors, and be as accurate and as clear as possible. Most of the guidelines herein are simply for the purpose of prescribing orderliness in presentation. Other guidelines provide general conformity of the overall format of your manuscript with the format of theses and dissertations nationwide; this conformity in format may be more important for dissertations, which are published on microfilm, than for theses.

A. Required Bound Copies
Please check with your department administrator to determine if a paper bound copy of your dissertation/thesis is required to be deposited and cost for binding.

B. Paper
It is optional to use quality bond paper of 100% cotton content, 16 to 24 pound weight, in the one departmental copy of the thesis/dissertation if required as described above, and in all additional personal copies as well. The standard sheet size is 8 ½ x 11 inches. Permanized parchment bond (24 pound/100% cotton content) is available when using the services through the UTHSCSA Print Shop. If the manuscript is to be duplicated at this institution, the students should notify the Supervisor of the Print Shop at least two months prior to the expected date of duplication about the approximate number of copies which will be requested and the type of paper to be used. At this time, the student should also make certain that the necessary amount of paper appropriate for photograph duplication will be available.
C. **Typing**
Theses and dissertations are typewritten on one side of the paper in black print. Select an easy-to-read font (i.e., Arial, Times New Roman, etc.) that is no smaller than a size 10 and preferably a size 12.

D. **Margins**
The left (or binder’s) margin and the top margin must be at least 1 ¼ inches, the right and bottom margins at least ¾ inch. These margins should be used consistently used throughout, whether the material is textual or graphic.

E. **Abbreviations**
No abbreviations should be used in either the title or the Abstract, with the exception that standard units of measurement and chemical symbols of the elements may be used without definition in the title, abstract, or text. The genus and species name of an organism may not be abbreviated in the title, or the first time it is used in either the abstract or the text. However, the genus name may be abbreviated thereafter provided there would be no confusion with other organisms cited.

All other abbreviations used in the text should be introduced in parentheses the first time the parent word is used (e.g.,... orthophosphate (P\(_i\))). You may wish to include in addition a list of all abbreviations used, in the “Supplementaries” portion of your thesis/dissertation (see Section VI. B. of these Instructions).

Commonly accepted abbreviations may be used in tables and figures without definition (e.g., avg, temp, wt, etc.); other abbreviations which were not previously introduced in the text should be defined in the table or figure legends (e.g., does ND mean “not done” or “not detectable”). Refer to the style manuals in the Library or to the “Instructions to Authors” in the major journals in your field for lists of commonly accepted abbreviations, and to the latter sources particularly for the officially accepted abbreviations of scientific terms.

F. **Guidelines for Publishing Electronically with Proquest/UMI**
The dissertation is required to be sent to Proquest/UMI and optional for the thesis, with the exception of a thesis from the School of Nursing. The document can only be uploaded as a pdf file. A Word document can be converted to a pdf using Adobe Acrobat (any version). When converting, ensure that the document is: (1) optimized for printing; (2) there are no security settings; (3) all fonts are embedded; and (4) images/graphics have a resolution of at least 600dpi. Documents over 100 MB cannot be uploaded electronically to Proquest/UMI. In this case, a CD must be sent to ProQuest and they will upload the document for you.

G. **Use of Copyrighted Material**
Writers of theses and dissertations are responsible for the inclusion in their manuscripts of any material on which others hold copyright. The type of copyrighted material most frequently used in scientific theses and dissertations is graphic, i.e. diagrams, illustrations, etc. You must obtain written permission for use of copyrighted material from the holder of the copyright, identified by either the symbol © or the phrase “For permission to reproduce material....” on one of
the preliminary pages of the book, monograph or journal from which you wish to reproduce material. The Copyright Disclaimer form which is available from the Registrar's office, must be signed and submitted by the author of a thesis or dissertation which includes copyrighted material before approval of the thesis or dissertation by the Dean can be granted; it is not to be included as a page in the manuscript. You will note in this form the phrase “any extensive copyrighted material” which you should interpret conservatively; anything more than a short passage or a very simple diagram may be considered extensive. It is recommended that the phrase “Reproduced by permission of (copyright holder)” be included at the end of the legend describing a reproduced copyrighted figure, or at the end of a long reproduced copyrighted passage of text.

H. Microfilming, Electronic Publishing and Abstract Publication

The dissertation of all recipients of the Doctor of Philosophy degree from this institution are required to be stored digitally by Proquest/UMI Information and Learning, as are the dissertations from most graduate schools in the United States. This electronic format and microfilm reproduction are methods of publication, and can be copied upon request by libraries or individuals.

In addition, the Abstract of each dissertation is published by Proquest in the monthly journal Dissertation Abstracts International, which is available electronically through the UTHSCSA Library. This serves both to provide a concise summary of your work to a wide audience and to bring your dissertation to the attention of scientists who may wish to request a copy of the entire text.

There is no fee for microfilming and traditional publishing of the doctoral dissertation/thesis and publication of the Abstract with Proquest. Open-access publishing is also available at a cost of $95.00. Publishing Guides containing more information are available on the Proquest website at http://www.etdadmin.com/cgi-bin/main/resources?sitId=173#guides.

I. Publishing Agreement and Registration for Copyright of the Dissertation/Thesis with Proquest/UMI

The Dissertation Publishing Agreement with Proquest grants to them the non-exclusive, worldwide right to reproduce, distribute, display and transmit copies of the dissertation, abstract, bibliography and other meta-data (in whole or in part) in such tangible and electronic formats as may be in existence now or developed in the future. This agreement does not in any way preclude publication of the dissertation in book form, or of any portions thereof in journals; conventional regulations are then applied by the publisher of such books or journals. However, if you have concerns about protecting patent or other rights derived from the dissertation, you may wish to claim United States copyright in your dissertation. In this case, you should agree to the statement for the Authorization to Apply for Registration of My Claim to Copyright section of the electronic submission. A fee of $65.00 is charged for this service and includes two copies of your dissertation or thesis to be deposited in the Library of Congress, filing fees, and monitoring of the registration process. A copyright notice page must be included in each copy of such a copyrighted dissertation, giving the full legal
II. NUMBERING OF PAGES

Every sheet which is part of a thesis/dissertation is included in the page counting, even if it has only one word on it, with the exception of the blank Fly Page which required for bound copies.

A. Preliminaries
The pages containing the preliminaries, beginning with the Title page, should be numbered consecutively with lower case Roman numerals (i, ii, iii, etc.), except that the number should not be typed on either the Title page, Copyright Notice page (if included), or the Approval page.

B. All Other Sections
Beginning with the first page of the text, all pages thereafter should be numbered consecutively with Arabic numerals (1, 2, 3, etc.).

C. Location of Page Numbers
Page numbers should be placed in the same location for all sections of the dissertation/thesis. The numbers are to be centered at the bottom of each page, at least ½ inch from the bottom edge. This includes the preliminary section, all text pages including text-associated components (see Section V. of these Instructions), the first page of the Table of Contents, each major section of the text, the Appendix, the List of Abbreviations, the Literature Cited and the Vita sections.
III. ORGANIZATION OF CONTENTS

A. Sequential Order
The content of each thesis/dissertation should be arranged in the order shown below. Also included below are the pages to which you may refer for explanations in these Instructions, and for sample pages in the Appendix.

<table>
<thead>
<tr>
<th>Content</th>
<th>For explanations, see Instructions</th>
<th>For sample, see Appendix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminaries</td>
<td>Page(s)</td>
<td>Page</td>
</tr>
<tr>
<td>Title Page</td>
<td>9</td>
<td>1A</td>
</tr>
<tr>
<td>* Copyright Notice Page</td>
<td>9</td>
<td>2A</td>
</tr>
<tr>
<td>Approval Page</td>
<td>9</td>
<td>3A</td>
</tr>
<tr>
<td>* Dedication Page</td>
<td>10</td>
<td>--</td>
</tr>
<tr>
<td>Preface or Acknowledgement</td>
<td>Page(s)</td>
<td>10</td>
</tr>
<tr>
<td>Abstract</td>
<td>10</td>
<td>4A</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>10</td>
<td>5A</td>
</tr>
<tr>
<td>List of Tables</td>
<td>10</td>
<td>6A</td>
</tr>
<tr>
<td>List of Figures</td>
<td>10</td>
<td>6A</td>
</tr>
<tr>
<td>* List of Plates</td>
<td>10</td>
<td>6A</td>
</tr>
<tr>
<td>TEXT COMPONENTS</td>
<td>11-14</td>
<td>--</td>
</tr>
<tr>
<td>SUPPLEMENTARY SECTIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Appendix</td>
<td>14</td>
<td>--</td>
</tr>
<tr>
<td>* List of Abbreviations</td>
<td>14</td>
<td>--</td>
</tr>
<tr>
<td>Literature Cited</td>
<td>14-16</td>
<td>--</td>
</tr>
<tr>
<td>Vita</td>
<td>16</td>
<td>--</td>
</tr>
</tbody>
</table>

* These are optional items, but should be placed in the order shown if they are included.

B. Table of Contents and Page Arrangement
A sample page of a hypothetical Table of Contents is shown on page 5A of the Appendix as a reference for the following guidelines.

1. The preliminary pages
The Table of Contents should first list the page numbers in lower case roman numerals of each of the preliminary sections, whether or not the numeral appears on the page itself (e.g. Title Page). If one of the preliminary sections extends over more than a single page, as do the Table of Contents and List of Tables in the hypothetical example, list only the number of the first page. Only the first letter of each noun should be capitalized.
2. The text pages

In a scientific thesis/dissertation, the text normally is comprised of the following 2 sections:

Introduction
Literature Review

These 2 sections may be combined with the Introduction and the section title or the combined section entitled “Introduction”.

Additional sections include:

Materials and Methods
Results
Discussion
Summary

The last 2 sections may be combined and the section entitled ‘Discussion and Summary.’ With the approval of your Supervising Committee, you may use other titles for the sections of your text if they are more appropriate for the research problem you investigated. You may also choose to insert a separate short (one page, more or less) section on ‘Statement of the Problem’ or ‘Specific Research Objectives’ between the Literature Review and Materials and Methods sections, or incorporate it as the concluding part of the Introduction and the Literature Review section. Basically, the text should present in sequence: the background of the problem and why you investigated it, how you went about it, what you found out, and what the significance of your findings is.

The Table of Contents should list the number of the first page of each section and subsection, the titles of which should be identical in wording with those in the text. The Table of Contents must include all subsection titles (termed subheadings) which are used in the text. In both the Table of Contents and the text, the title of each section (termed headings) should be capitalized and preceded by the appropriate upper case roman numeral (e.g. II. MATERIALS AND METHODS, and the subheadings within each section designated in descending order as A., 1., a., 1), a), etc. Such designations help the reader comprehend more clearly the relationships between the various parts of the text. All headings should be preceded and followed by double-spacing in the Table of Contents. Subheadings more than one line long should be singled-spaced. Clusters of subheadings may be singled-spaced, but should be separated from headings by double-spacing. Or, you may elect to have all headings and subheadings in the Table of Contents separated by double-spacing.

In the text, begin each of the major sections on a new page. Center the section number and title (e.g. II. MATERIALS AND METHODS) on the top line of the page, underline, and triple-space before typing the following text material. All material within the text should be doubled-spaced, except for figure legends, block quotations and footnotes (see Section V. of these Instructions) and subheadings more than one line long.
subheading should be underlined, with capitalization of the initial letter of either 1) only the first word, or 2) the first and last words and of all other words except articles, prepositions and coordinate conjunctions. In these Instructions, each capital letter subheading is typed by method 2 and all other subheadings by method 1. Begin each capital letter subheading at the left margin, and indent succeeding subheading 5 spaces, e.g.:

A.  Xxxxx Xxxxx xx xxx Xxxxxx  
   1.  Yyy yy yyyy yyyy  
      a.  Zzzzzzz zzzzz  

Text material which follows capital letter subheadings should be indented 5 spaces. However, text material which follows lower-level subheadings (1. and a. above) may begin on the same line, 4 spaces to the right of the subheading, provided that this placement used consistently throughout and that a period is placed at the end of the subheading.

3.  The supplementary pages  
This portion of the thesis/dissertation contains in the following order, two optional sections (Appendix and List of Abbreviations) and two obligatory sections (Literature Cited and Vita).

Following the same format, the concluding portion of the Table of Contents would look like this:

IV.  Discussion ........................................................................................................... 94  
V.   Summary ........................................................................................................... 113  
Appendix .................................................................................................................. 116  
Literature Cited ....................................................................................................... 121  
Vita ............................................................................................................................. 133  

Note that in the Table of Contents only the first letter of each word in the heading of the supplementary section is capitalized to set these supplementary sections off from the text material.

However, in the body of the thesis/dissertation, the heading of the supplementary sections are always capitalized (e.g., APPENDIX), like the section headings of the text. For typing, you may choose either of the methods below to demarcate the APPENDIX, LIST OF ABBREVIATIONS and LITERATURE CITED sections. However, the VITA section is always typed according to Method 1.

Method 1. Begin each section on a new page. Center the capitalized section heading on the top line of the page. Then triple-space before typing the body of the section. If there is more than one Appendix section, assign a letter to each (i.e. APPENDIX A, APPENDIX B, etc.), and begin each section on a new page. In the case of an Appendix which carries a title, double-space before typing the title below APPENDIX, then triple-space before typing the body of the section. The Table of Contents should list only the number of the first page of each supplementary section or subsection.
Method 2. Insert a division sheet (also called half-title page) before the body of the section. Type the section designation (and title, if used) in the center of the division sheet, e.g.:

**APPENDIX**

*The Appendix Title*

The body of each section begins at the top of the following page. If there is more than one Appendix section, include a division sheet for each. The page number of the division sheet is the number to be used in the Table of Contents.
IV. PRELIMINARY SECTIONS

A. Fly Page
This is a blank page for protection during binding. It is not included in the page numbering or required in the electronic submission of your thesis/dissertation.

B. Title Page
The title of the thesis/dissertation should be as succinct and as accurate a description of the contents as possible. Do not use more words than necessary; for example, do not begin a title with “A Study to Determine the Effects of....” rather than “Effect of...”. Use the key words which describe what you tried to find out about the system you studied. Also, the key words in your dissertation title are entered into the indexes of Dissertation Abstracts International and Comprehensive Dissertation Index, and facilitate retrieval of your work from these sources by other researchers. The following titles of two recent dissertations from this school are not only succinct but also informative: “Influence of Small Bowel Resection on Gastric Glandular Cell Kinetics in the Rat” and “Regulation of Acetate Kinase from Veillonella alcalescens.”

The title of your thesis/dissertation should be considered for approval by your Supervising Committee at the same time that the body of the manuscript is considered. It should be recognized that the title of the manuscript need not be absolutely identical with the title of your original approved research proposal, since the emphasis of your research may have shifted somewhat during the course of your work.

The required format for the Title page is shown on page 1A of the Appendix. If the name of a taxon is used in a title, it should be underlined or italicized, e.g., VEILLONELLA ALCALESSENS or VEILLONELLA ALCALESSENS.

C. Copyright Notice Page
This is included ONLY in theses or dissertations for which registration for claim to United States copyright has been applied for. For explanation, see parts I. of Section 1 of these Instructions on page 3, and for Copyright Notice Page, see page 2A of the Appendix.

D. Approval Page
The members of the candidate’s Supervising Committee indicate their approval of the thesis/dissertation by their signature on this page. These signatures are to be inscribed only after both of the following requirements have been met: 1) successful defense of the thesis/dissertation at the final oral examination, and 2) submission by the candidate of the final approved electronic copy of the thesis/dissertation to the Graduate Dean’s office.

The Approval page also bears the signature of the Dean of the Graduate School of Biomedical Sciences. The procedures and actions required prior to signature of the Approval Page by the Dean are described in Section IX of these Instructions, which concerns the Guideline for Planning Your Graduation for degree candidates.
The required format for the Approval page is shown on page 3A of the Appendix. Only one original signed Approval page is required to be submitted to the Graduate Dean’s Office and can be included in copies submitted for binding. An Approval Page without original signatures is included in the electronic version of your thesis/dissertation.

E. Dedication Page
The candidate may wish to dedicate the thesis/dissertation to one or more individuals as a personal expression of sentiment or gratitude.

F. Preface or Acknowledgement Page(s)
The aid, advice and/or counsel of those persons who had a significant role in the development and accomplishment of the research should be acknowledged here.

G. Abstract
1. Content
   The Abstract should be a concise statement of the content of the thesis/dissertation, including the significance of the results described therein. The first page should be typed in the required format shown on page 4A of the Appendix, and the succeeding page(s) in the format of the text pages. The title of the Abstract must be identical with the title of the complete thesis/dissertation. The Abstract text must not exceed 600 words. Remember that no abbreviations may be used in the Abstract, with the exception of those noted in Section I. F. of these Instructions. Mathematical and chemical formulas, symbols, chemical structures, and words of foreign languages should be set forth clearly and accurately. This is particularly important for a dissertation Abstract, which will be transposed into type without editing or revision for publication in Dissertation Abstracts International. Since Abstracts of master’s theses are not published in this way, the line containing the publication number should be omitted.

2. Requisite copies
   a. Distribution with announcement of final oral examination
      All candidates must submit three (3) copies each of the Abstract and Vita, stapled together, to the Graduate Dean’s Office with the Request for Final Oral Examination (GSBS Form 40). The Graduate School Office will distribute these copies, together with announcement of the final oral examination (see Section IX – Guidelines for Planning Your Graduation).

      None of these copies will be retained for future binding with the thesis/dissertation and therefore are not required to be formatted as instructed above.

H. Table of Contents
See Section III of these Instructions, and page 5A of the Appendix.

I. List of Tables
   List of Figures
   List of Plates
See Section V, pages 11, 12, of these Instructions, and page 6A of the Appendix.

V. TEXT-ASSOCIATED COMPONENTS

A. Tables
Each table should be typed on a separate page, and be placed adjacent to the first page of the text on which it is referred to. None should normally be placed in the Appendix, but if any are placed there because of special reasons, they should not be included in the List of Tables.

The List of Tables should contain the number and exact title of each table, and the number of the page on which it appears. It is recommended that Arabic numbering of tables be used, to facilitate reference to them in the text (e.g., Table 18 vs Table XVIII). Page 6A of the Appendix shows a portion of a sample List of Tables. Each title listed should be separated from the next by double-spacing, but should be single-spaced internally if the title requires more than one line of type. The titles in the List of Tables should be typed as shown, with capitalization of the initial letter of the first and last words and of all other words except articles, prepositions and coordinate conjunctions.

In the table itself, on the other hand, all letters in the title should be capitalized. It is preferable to arrange the data so that columns of like nature read down, not across. The column headings and the variable factors should be sufficiently clear so that reference to the text is unnecessary. Explanatory footnotes may be used, but they should not include extensive descriptions of experimental procedures. The entire table, with title and footnotes, must fit within the limits of page margins (see Section I. E.); it is permissible to place wide tables sidewise on the page, with the top of the table toward the inner margin. Tables larger than the page limits may be reduced to acceptable size through a high quality reproduction process.

B. Figures
You may designate as figures all of the illustrations in your thesis/dissertation, irrespective of whether they are graphs, diagrammatic representations, photographs, or other graphic material. Alternately, you may choose to designate as plates, rather than as figures, those illustrations which are of necessity duplicated on a type of paper different from that used from the text, e.g., tissue section photographs or electron micrographs, which must be either glossy prints or duplicates on AL paper. All illustrations must fit within the limits of page margins (see Section I. E.).

Each figure requires a figure number, a title, and in most cases, an explanatory legend. Each figure’s legend must be placed in total on the bottom of the same page as the figure it is describing with 5 single spaced lines between the bottom of the figure and the legend. The legend can be single spaced and reduced to font size 10. Exceptions are permitted in cases where the complete legend can not be included on the same page as the figure, because the size of the figure or illustration can not be reduced. In this case, the legend should be added on a separate page following the figure and centered on a single page. If a figure can not be reduced and therefore necessary to be landscaped to view all data, then
the legend can also be landscaped and added to the bottom of the page within the minimum margin requirements.

If the figure and/or legend did not take up an entire page, then it should be centered on the page within the minimum page margins.

Each figure/legend page should be placed adjacent to the first page of the text on which it is referred to. None should normally be placed in the Appendix, but if any are placed there because of special reasons, they should not be included in the List of Figures.

The Lists of Figures should contain the number and exact title of each figure and the number of the figure or figure/legend page. A portion of a sample List of Figures is also shown on page 6A of the Appendix. The same guidelines of column alignment, arabic numbering and capitalization of words in the title as are used for the List of Tables should be applied to the List of Figures. The title of the figure should be as succinct as possible, and should not include detailed information which properly belongs in the explanatory legend.

On the figure/legend page, the figure title should be capitalized in the same way as it is in the List of Figures. The explanatory legend should be sufficiently clear so that reference to the text is unnecessary, but it should not include extensive descriptions of experimental procedures.

C. Plates
As noted above, the designation of certain types of illustrations as plates is optional. However, if the designation is used, it must be applied uniformly to all illustrations which are duplicated on a type of paper different from that used for the text. The following rules apply to all such illustrations, whether they are designated as figures or as plates.

Glossy photographs must be no larger than the page margin limits and be mounted with dry-mounting tissue or a mounting cement. If several small related photographs are mounted within the margin limits on a single page, the entire page is designated by a figure or plate number, and each individual photograph lettered as A, B, C, etc. Color photographs may be used. (see "Preparing Your Manuscript for Microfilming" by ProQuest).

Alternatively, you may elect to use photographic reproduction on AL paper instead of glossy prints for all black-and-white pictures (consult UTHSCSA Photography Unit regarding AL paper). Such reproduction obviates the mounting of multiple photographs and can provide, if well done, sufficient contrast to be usable for the microfilmed dissertation copy. The same rules of margin limits and clustering of smaller pictures also apply to AL reproductions.

The rules and recommendations regarding figures and legends presented in Section V. B. above are also applicable to plates.
D. Quotations
You are cautioned that it is considered plagiarism to present the written words of others as your own writing. You must clearly indicate by block quote or quotation marks, by reference citation and by permission from the copyright holder, that the material was not written by you. Prose quotation of two or three sentences and over four lines long should be in block quote (i.e., single-spaced, indented uniformly 5 spaces from the left margin). Quotation marks are not used for block quote. Shorter quotations may be incorporated in the text, and should be enclosed in double quotations marks ("."). Long quotations of a half-page or more may be more suitably placed in the Appendix. Remember the copyright regulations!

E. Footnotes
Footnotes should be used sparingly, and only when incorporation of a material into the text would be awkward or discordant. They should be placed at the bottom of the page, and demarcated from the text by a solid line beginning at the left margin followed by double-spacing before the footnote is typed in single-spaced format. See the Turabian style manual for information about footnote numbers.
VI. SUPPLEMENTARY SECTIONS

A. Appendix
   An appendix may be a useful device for presenting relevant material, the nature of which would make its placement within the text awkward or unsuitable. The following types of material may be appropriately placed in an appendix: descriptions of computer programs, computer printouts, lengthy quotations, very detailed tables of complex original data, details of mathematical or statistical analyses, questionnaires and verbatim responses, subject consent form, letter to agency for access to subjects, etc.

   If more than one type of material is placed in the appendix, there should be a separate appendix for each type, with each denoted by a letter and a descriptive title. The table of Contents should list these as:

   Appendices
   Appendix A (Title) .................................................................
   Appendix B (Title) .................................................................

   When only one appendix is used, it need not be given a title. If a title is used, it should be included in the Table of Contents:

   Appendix (Title) ...........................................................................

B. List of Abbreviations
   As noted earlier in Section I. E. of these Instructions, you may wish to include a List of Abbreviations as an aid to the reader. However, inclusion of such a list does not exempt you from the rule that every abbreviation used in the text, except standard units of measurement and chemical symbols of the elements, should be introduced in parentheses the first time the parent word is used. An abbreviation which is used only in figures or tables, and which is not a commonly accepted abbreviation, should be defined in the legend each time it is used, but need not be included in the list.

   The List of Abbreviations should consist of two columns with the abbreviations arranged alphabetically in the left-hand column and the parent word or term in the right-hand column.

C. Literature Cited
   An excellent reference for methods of citation of bibliographic entries, such as journal entries, monographs, books, etc., is the CBE Style Manual, available in the UTHSCSA Library reference section.

1. Procedures for citation
   Any one of the three following procedures may be selected for citation of references in the text and order of listing in the Literature Cited section. However, procedures 2 and 3 may be quite troublesome, since insertion of new reference citations in progressive thesis/dissertation drafts requires renumbering of all succeeding references in both the text and the Literature Cited section.
Procedure 1. List the references in alphabetical order by surname of first author, and then if necessary by surname of second author. Two or more publications by the same authors should be listed in chronological order; when these are in the same year, cite and list as 1974a, 1974b, etc. Citation in the text is by author and year, as (Smith, 1974) for a single author, (Smith and Jones, 1975) for two authors, or (Smith et al., 1976) for three or more authors.

Procedure 2. List the references in alphabetical and chronological order (if same author) as above, number the references consecutively, and cite the number in the text, e.g. (34).

Procedure 3. List the references in numbered order according to their sequential citation in the text, e.g., (18), the eighteenth reference cited in the text.

2. Specific citations
   a. Journal Articles
      The Literature Cited section must follow a consistent format for all journal article citations, and must include the following information for each journal article cited, preferably in the order and format shown:
      
      Required information
      Author(s) name(s); year of publication; title of article; name of journal; volume number of journal; inclusive pages of article.
      
      Preferred order and format
      
      (Each item above, except for the journal name and volume number, concludes with a period, but a period is not added if the item ends with an abbreviation. The journal volume number is underlined, and followed by a colon.)
      
      Abbreviation of journal names
      You may use either the full name of each journal, or the abbreviation of each journal name; you must be consistent in usage for all citations. Use only the standard accepted abbreviations for journal names; do not make up your own. These abbreviations for the names of scientific journals can be found in various indexes in the UTHSCSA Library reference stacks.

b. Other types of citations
For Literature Cited entries other than journal articles, such as books, monographs, unpublished theses/dissertations, etc., consult the CBE Style Manual, or a style manual approved by your Supervising Committee. The format of these entries should be consistent with the format of journal entries, i.e., if the year of publication follows the names of the authors, as in the preferred format entry shown, it should do so for other citations also.

D. Vita
The Vita section should be in narrative form and should include the following information:
Full name of candidate
Parents’ Names
Birth date and place
Colleges from which previous degrees were received, and year of degree
Scholastic honors received
Year of admission to degree program at UTHSCSA

The Vita may also include the following information if you choose:
High school from which candidate graduated
Name of spouse and year of marriage
Names of children and year of birth
Military service and years
Relevant working experience
List of publications, designated as Abstracts and Journal Publications

In typing, the word VITA should be centered on the top line of the page, followed by triple-spacing before typing the narrative text which should begin with the full name of the candidate.

See Section IV. G. 2. of these Instructions concerning required copies of the Vita.
VII. OPTIONAL FORMAT FOR PREPARATION OF DISSERTATIONS

1. **Text Organization**
   The recommended organization for the text of the Ph.D. dissertation written in the chapter format is the following:

   Comprehensive Abstract

   General Introduction

   Literature Review

   Chapters I, II, III, etc.

   Overall Discussion

   References

   The general instructions and literature review can be written as a single section of the dissertation as currently outlined by the Graduate School.

2. **Chapter Organization**
   Each chapter should be organized in the format of an article that would be published in a scientific journal as follows:

   Title Page

   Abstract (optional)

   Introduction

   Materials and Methods

   Results

   Discussion

   The result and discussion section of each chapter can be combined in a single section entitled “Results and Discussion” as currently employed by some scientific journals.

3. **Footnotes**
   If footnotes or acknowledgements are required they should appear at the end of each chapter.
4. **Papers That Have Been Published or Accepted for Publication**
   If a paper has been published, accepted for publication, or submitted for publication, the following information should be given at the end of each chapter in the form of footnotes and should not appear on the chapter title page:

   a. The title of the article as it appears or will appear after publication.

   b. The complete and correct order of authors.

   c. The journal reference, i.e., volume, page, and date, if known, or journal to which the manuscript has been accepted or submitted.

   Even though an article may have been published or accepted for publication, the graduate advisor and/or the graduate student Supervising Committee has the prerogative to request modifications of such a manuscript before inclusion as one of the chapters in the dissertation.

5. **Appendix**
   If the graduate advisor and/or the graduate student’s Supervising Committee feels it is appropriate to include detailed methodology or preliminary experimental results in the dissertation that would normally not be found in a published article, it should be placed in an appendix section after the last chapter.

6. **Writing Style**
   Reprints from published scientific journal articles **CANNOT** be used as chapters. Rather, these reprints must be re-typed in the writing style and format currently approved by the Graduate School, i.e., on approved paper with the proper spacing, margins, etc.

   Figures and tables should be numbered with unique designations so they can be easily identified and located, e.g., consecutively throughout the entire dissertation or consecutively in each chapter with a chapter designation. In the latter case, figures could be numbered as 1.1, 1.2, 1.3, etc., and 2.1, 2.2, 2.3, etc. Tables could be numbered 1.I, 1.II, 1.III and 2.I, 2.II and 2.III.

   All references utilized in the dissertation should be cited in the same style throughout the text. All literature citations should be located in one section at the end of the text in a style currently approved by the Graduate School. This will eliminate the use of reference sections at the end of each chapter in an effort to reduce redundancies.

7. **Quality of Dissertation Research**
   It is anticipated that both the quality and quantity of the data presented in the Ph.D. dissertation written in the optional chapter format, will be the same as currently accepted by the Graduate School. The only difference between the chapter style dissertation and the more traditional dissertation will be the format in which the data is organized and presented.
It is further anticipated that each chapter should clearly represent the work of the student. Any questions regarding the quality of the research presented in the dissertation (the relative contributions of the student, the faculty advisor, or other individuals to the total research and/or writing effort represented by the individual chapters present in the dissertation, what collection of experimental results is appropriate to constitute each chapter, and decisions concerning which students should be eligible to employ a chapter format in writing their dissertation) should be the responsibility of the graduate student’s Supervising Committee.

8. **Approval**
   The Supervising Committee must approve the use of the chapter format. This decision should be based on the nature of the research project and the ease by which the data can be organized and presented in chapter format. The publication record and/or the anticipated submission of dissertation results for publication by the student should also be considered in determining if the chapter format is appropriate.
VIII. SUBMISSION OF THE THESIS/DISSERTATION DRAFTS

The manuscript draft of the thesis or dissertation must be reviewed by the candidate's Supervising Professor and the other members of the Supervising Committee for scientific content, format, clarity, coherence and grammar. After all sections of the dissertation have been completed, a period of at least 3 weeks should be allowed for critical review of the complete manuscript by the Supervising Professor and revisions by the candidate in accordance with this review. However, it is customary and useful for the student to submit drafts of manuscripts sections, tables and figures to the Supervising Professor as the writing progresses; such interim review by the Supervising Professor and by other intra-institutional members of the Supervising Committee should obviate need for major revisions of the full manuscript. After the Supervising Professor's review of the complete manuscript, a period of at least 3 weeks must be allowed for critical review of the revised complete manuscript by all other members of the Supervising Committee (including the extra-institutional member) and revisions in accordance with these reviews.

Since theses are normally considerably shorter than dissertations, the time periods for critical review of the complete thesis manuscript by the Supervising Professor and the Supervising Committee, and revision by the candidate, may be shortened to 2 weeks each, provided that all members of the Supervising Committee agree to the shorter time periods.

When all members of the Supervising Committee have judged the thesis or dissertation submitted by the candidate to be in its final form and suitable for defense at the Final Oral Examination, they shall so indicate by signature on the appropriate Request for Final Oral Examination form (GSBS Form 40).

A pdf of the dissertation or thesis should also be sent to the Graduate Dean’s Office for format review at the time the Request for Final Oral Examination form is submitted (see Section 1F of these instructions—Guidelines for Publishing Electronically).
IX. GUIDELINES FOR PLANNING YOUR GRADUATION

For each Fall and Spring Semester or Summer Session, the Graduate School Office issues a timeline for planning your graduation that provides a schedule of deadlines for degree candidates who anticipate graduating that term. These timelines are available on the Graduate School website http://gsbs.uthscsa.edu/main/currentstudents/graduationinformation or http://gsbs.uthscsa.edu/main/currentstudents/currentstudentresources

A. Actions Required for Ph.D. Candidates:

Application for Degree and Diploma Name Card Request Form
Diploma Name forms are available from the Graduate School Office. Please complete this form at the time you schedule your defense date and submit the Request for Final Defense and Oral Examination (GSBS Form 40).

Dissertation Drafts
See Section VIII of these Instructions.

Request for Final Defense and Oral Examination
The Request form (GSBS Form 40) is signed by all members of the Supervising Committee when they have judged the dissertation to be in its final form and suitable for defense at the Final Oral Examination, and have agreed to examine the candidate at the time and date indicated on the Request form. The signed Form 40 should then be submitted through the Chair of the Committee on Graduate Studies (COGS) to the Graduate School Office for signature by the Dean. When the time necessary to obtain the signature of the extra-institutional member of the Supervising Committee would delay submission of the Request, it is the responsibility of the Supervising Professor to verify to the Chair of the COGS that the external member has agreed orally or in writing to the suitability of the dissertation and to participate in the Examination. (The Supervising Professor should obtain the signature of the external member on the Request form at the time of the Final Oral Examination for resubmission to the Graduate School Office.) Reservation of the Examination room for the specified time should be made by, or with the concurrence of, the Supervising Professor. The signed Request form, together with three (3) copies of the Abstract and Vita, stapled together, must be submitted to the Graduate School Office no later than the scheduled deadline date appropriate for the date of the Final Oral Examination. On receipt of these materials, the Graduate School Office will arrange publication of the announcement and distribute it to the members of the Graduate Faculty Council (electronically), the Chairs of all COGS, the candidate’s Supervising Committee, and the candidate’s files in the Registrar’s Office and the Graduate School Office. The announcement is sent also to all UTHSCSA deans and academic departments, and to appropriate departments in other San Antonio educational and research institutions.

Abstract
See Section IV. G. of these Instructions.
Vita
See Section VI. D. of these Instructions.

Final Oral Examination
The Examination is conducted by the Supervising Committee. At the public session, all interested persons may attend and have the right to question the candidate. After the public defense, the Final Oral Examination continues with an intensive oral examination by the Supervising Committee.

Report on Final Oral Examination
The Supervising Committee members vote on the candidate’s success or failure on the Examination. The Report of Final Oral Examination (GSBS Form 43) is submitted by the Supervising Committee to the COGS for consideration. In the event of favorable actions for recommendation of granting of the degree by both Committees, the Chair of the COGS shall so indicate by signature on the Report of Final Oral Examination and submit the Report for consideration by the Graduate Faculty Council (GFC), at its next monthly meeting.

Dissertation
Dissertation Approval Page
If no further revisions and/or corrections of the dissertation manuscript are requested by the members of the Supervising Committee during the course of the Final Oral Examination, the dissertation Approval page may be signed at that time. However, the Approval page should not be signed until the candidate has complied with all requests for revisions and/or corrections to the satisfaction of the Supervising Committee members.

The final electronic dissertation (pdf) including the Approval page signed by the Supervising Committee members, must be submitted by the Candidate prior to consideration by the GFC of the Report of Final Oral Examination and recommendation for granting of the degree. The deadline dates for electronic dissertation submission shown in the Guidelines for Planning Your Graduation are appropriate for the next Graduate Faculty Council meeting following the date of the Final Oral Examination. If the preparation of the final copy is delayed, the electronic dissertation should be submitted in time to meet the deadline date for the subsequent Council meeting. In order for the candidate to graduate at the end of the term in which the Final Oral Examination was held, the final dissertation copy, ready for duplication, must be received by the Graduate School Office no later than the last submission deadline date for that term. Delay in submission beyond this date will necessitate both postponement of consideration by the GFC of granting of the degree until the subsequent term, and registration by the candidate for the Dissertation course in the subsequent term.

Survey of Earned Doctorates Form
Copyright Disclaimer Form
UTHSCSA Library Copyright Permission Form
These forms, which are available on the Graduate School website under graduation information or current student resources, should be completed and submitted by the candidate together with the final copy of the electronic dissertation and the signed Approval page.

**Microfilming and Electronic Publishing**

There is no fee for Microfilming, Electronic Publishing and Dissertation Abstract Publication with ProQuest/UMI. There is also no fee for electronic publishing with the UTHSCSA library. For specific instructions on electronic publishing with Proquest/UMI see graduation information website at [http://gsbs.uthscsa.edu/main/currentstudents/graduationinformation](http://gsbs.uthscsa.edu/main/currentstudents/graduationinformation). Publishing with ProQuest/UMI should be initiated only after you have been approved by the Graduate Faculty Council.

**Graduate Faculty Council (GFC) Meeting**

The Graduate Faculty Council will consider the recommendation by the Committee on Graduate Studies (COGS) for granting of the degree at the Council meeting closest to the submission to the Graduate School Office of all required materials: 1) Report on Final Oral Examination for the Doctor of Philosophy (GSBS Form 43); 2) the final copy of the dissertation; and 3) the dissertation Approval page signed by the Supervising Committee. If the Council does not approve the recommendation, it will refer the matter to the COGS with a recommendation for remedial action. If the Council does approve the recommendation, the Dean of the Graduate School of Biomedical Sciences will sign the GSBS Form 43 and the dissertation Approval page, and will notify the President of The University of Texas Health Science Center at San Antonio that the candidate has fulfilled all requirements of the Graduate School of Biomedical Sciences for the degree of Doctor of Philosophy. Upon the candidate’s certification by the president, the degree is conferred by the Board of Regents of The University of Texas System at the next annual Commencement at the end of the Spring Semester. However, the date of graduation indicated on the diploma is the date of Graduation Day of the academic term in which the Council and the President approve the recommendation for granting of the degree. Students who complete all of the requirements for a degree by the end of a Summer session or Fall semester may request the Registrar to provide a Certificate of Completion on the date of graduation.

**B. Actions Required for M.S. and M.S.N. Candidates:**

**Application for Degree and Diploma Name Request Form**

See A. above.

**Thesis Drafts**

See Section VIII of these Instructions.

**Request for Final Defense and Oral Examination**

Abstract

Vita

Final Oral Examination
The Graduate School of Biomedical Sciences does not require that the thesis be defended in a formal Final Oral Examination scheduled through the Graduate School Office and open to all interested persons, as is required for the Ph.D. dissertation. It does require that the thesis be defended by the candidate in a presentation before the Supervising Committee; the format in which this presentation is conducted shall be decided by the COGS, and shall be uniform for all M.S. or M.S.N. candidates in the program.

**Option 1.** If the COGS choose to require that the thesis be defended in formal Final Oral Examination scheduled through the Graduate School Office and open to all interested persons, then the procedures in A. above for Ph.D. candidates should be followed.

**Option 2.** If the COGS choose a less formal format, without public notification through the Graduate School Office, the following procedures apply. The Request for Final Defense and Oral Examination (GSBS Form 40) signed by the Supervising Committee members should be submitted to the Chair of the COGS, who shall indicate approval by signature in place of the Dean and transmit the form to the Graduate School Office. Two copies of the Abstract and the Vita should also be submitted with the Request Form for the candidate’s files in the Registrar’s Office and the Graduate School Office.

**Report of Final Oral Examination**
See A. above. Use GSBS Form 41 for MS thesis.

**Thesis**
**Thesis Approval page**
UTHSCSA Library Copyright Permission Form
See A. above.

**Microfilming and Electronic Publishing**
There is **no fee** for Microfilming or Electronic Publishing with ProQuest/UMI. There is also no fee for electronic publishing with the UTHSCSA library. For specific instructions on electronic publishing with Proquest/UMI see the gsbs website on graduation information at [http://gsbs.uthscsa.edu/main/currentstudents/graduationinformation](http://gsbs.uthscsa.edu/main/currentstudents/graduationinformation).

Publishing with ProQuest/UMI should be initiated only after you have been approved by the Graduate Faculty Council.

**Graduate Faculty Council (GFC) Meeting**
See A. above, but use GSBS Form 41 (for MS Students)
X. BINDING OF THE THESIS/DISSERTATION

The Approval page signed by the Dean, will be returned to the student by the Graduate Dean’s Office after a vote for recommendation for granting of the degree by the Graduate Faculty Council (GFC).

The Candidate should contact their COGS Assistant to obtain the Binding Memo to take to the UTHSCSA library.

Copies – required and personal – should then be duplicated from the original manuscript (see Sections I. A., B. and C. for regulations). After duplication, the original manuscript and all copies to be bound should be placed in individual envelopes each bearing the student’s name; program and contact information.

The student is responsible for taking the thesis/dissertation copies, individually wrapped and labeled along with the Binding Memo and payment to the Circulation Desk for transmittal to the bookbinding company. **Note: The UTHSCSA Library will not make copies or print your thesis/dissertation.** Payment to the UTHSCSA library can be done by check, cash, credit or IDT. The bound copies are usually returned within two months. Upon completion, the person responsible for distribution of the thesis/dissertation copies is notified that the copies are available for pickup.
TITLE OF DISSERTATION (OR THESIS)

(in capital letters, double-spaced if more than one line long)

maximum 6

A

DISSERTATION (OR THESIS)

maximum 4

Presented to the Faculty of
The University of Texas Health Science Center at San Antonio
Graduate School of Biomedical Sciences
in Partial Fulfillment
of the Requirements
for the Degree of

DOCTOR OF PHILOSOPHY (OR MASTER OF SCIENCE OR MASTER OF SCIENCE IN NURSING)

maximum 5

By

Student’s Full Name, Given Name First, and Previous Degrees

San Antonio, Texas

Month and Year of Graduation
(The month and year of the Graduation Day in the semester in which the degree is expected to be awarded.)
(COPYRIGHT NOTICE PAGE)

© Copyright
By
Elizabeth Jane Smith
2003
All Rights Reserved
# recommended ss lines

(Alignment all items below with left margin)

10

TITLE OF DISSERTATION (OR THESIS)
(in capital letters, single-space if more than 60 spaces long)

maximum 4

Student's Full Name
(only first letters capitalized)

maximum 6

APPROVED:

4

__________________________
Robert Smith, Ph.D, Supervising Professor

__________________________
Jane Smith, Ph.D

__________________________
Allan Smith, Ph.D.

__________________________
Gloria Smith, Ph.D.

__________________________
Davis Smith, Ph.D

(In addition to the top line for the Supervising Professor’s signature, there should be as many lines as there are other members of the Supervising Committee. All signatures must be in ink.)

maximum 4

__________________________
Date

3

(The date on the above line should normally be the date on which the thesis or dissertation is successfully defended, as indicated on the GSBS form Report of Final Oral Examination.)

APPROVED:

3

__________________________
David Weiss, PhD
Dean, GSBS
TITLE OF DISSERTATION (OR THESIS)
(in capital letters, arranged exactly as on Title Page)

Publication No. _______________________

Student’s Full Name, Ph.D. (*)
(or M.S. or M.S.N.)

The University of Texas Health Science Center at San Antonio
Graduate School of Biomedical Sciences

Supervising Professor: Given Name, Middle Initial, Surname

The text of the Abstract begins on this line, and continues, with double-spacing between lines, to the bottom margin and on to the following page.

* Only the degree for which the student is a candidate should be typed after the full name of the student.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>i</td>
</tr>
<tr>
<td>Approval</td>
<td>ii</td>
</tr>
<tr>
<td>Dedication</td>
<td>iii</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>iv</td>
</tr>
<tr>
<td>Abstract</td>
<td>v</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>viii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>xi</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xiii</td>
</tr>
<tr>
<td><strong>I. INTRODUCTION AND LITERATURE REVIEW</strong></td>
<td>1</td>
</tr>
<tr>
<td>A. Extracellular Streptolysin S-type Hemolysins</td>
<td>1</td>
</tr>
<tr>
<td>B. Cellular Streptolysin S-type Hemolysins</td>
<td>12</td>
</tr>
<tr>
<td>C. Statement of the Dissertation Problem</td>
<td>24</td>
</tr>
<tr>
<td><strong>II. MATERIALS AND METHODS</strong></td>
<td>25</td>
</tr>
<tr>
<td>A. Bacterial Strains</td>
<td>25</td>
</tr>
<tr>
<td>B. Chemicals and Enzymes</td>
<td>26</td>
</tr>
<tr>
<td>C. Growth Conditions and Cell Harvest</td>
<td>27</td>
</tr>
<tr>
<td>D. Preparation of Muralysin Derived from Bacteriophage Infected Group C</td>
<td>29</td>
</tr>
<tr>
<td>Streptococci</td>
<td></td>
</tr>
<tr>
<td>E. Disruption of Group A Streptococci</td>
<td>32</td>
</tr>
<tr>
<td>1. Sonication</td>
<td>32</td>
</tr>
<tr>
<td>2. Muralysin treatment</td>
<td>33</td>
</tr>
<tr>
<td>F. Preparation and Purification of RNA fractions</td>
<td>35</td>
</tr>
<tr>
<td>G. Assay of Hemolysin Activity</td>
<td>38</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Effects of Progressive Anoxia on Energy Metabolites in Rat Brain</td>
<td>4</td>
</tr>
<tr>
<td>Table 10</td>
<td>Concentrations of Cyclic AMP in Rodent Whole Brain Following Various Methods of Inactivation</td>
<td>85</td>
</tr>
</tbody>
</table>

LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Compounds Utilized as Inhibitors</td>
<td>11</td>
</tr>
<tr>
<td>Figure 18</td>
<td>Effect of SITS on Steady State C1⁻, P₁, and S0₄²⁻ Exchange</td>
<td>49</td>
</tr>
</tbody>
</table>

LISTS OF PLATES

<table>
<thead>
<tr>
<th>Plate</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate 1</td>
<td>Low Power (14,000 x) Electron Micrograph of Tissue from the Left Partietal Cortex of the Brain of a Mouse Sacrificed by Decapitation</td>
<td>69</td>
</tr>
<tr>
<td>Plate 14</td>
<td>High Power (105,000 x) Electron Micrograph of a Synaptosome Isolated from the Crude Mitochondrial Fraction (P₂ Pallet) Prepared from the Brain of a Mouse Sacrificed by Decapitation</td>
<td>85</td>
</tr>
</tbody>
</table>