

**Kalamazoo College**

---

**Health Sciences**

---

**Senior Handbook  
Class of 2006**

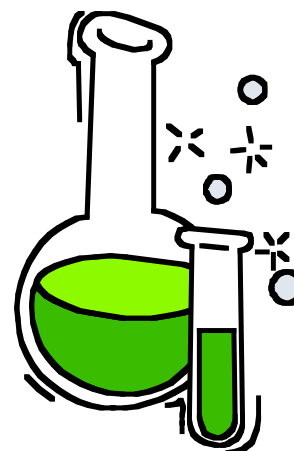
**Diane Kiino  
Dow 114  
dkiino@kzoo.edu**

**Health Sciences Web Site: <http://www.kzoo.edu/hsc>**

# Table of Contents

---

Handy Info .....	iii
The Handbook .....	1
Health Sciences Personnel .....	1
Requirements for the Major .....	2
Senior Seminar .....	3
Comprehensive Examinations .....	4
The Health Sciences SIP .....	6
SIP Tips .....	9
SIP Writing 101 .....	11
SIP Writing Nuts and Bolts.....	16
Guide to Critical Reading .....	18
Publicly Presenting Your SIP .....	19
Honors in the Major.....	20



# Handy Info

---

## Websites

Health Sciences URL	<a href="http://www.kzoo.edu/hsc">http://www.kzoo.edu/hsc</a>
Registrar's SIP Guidelines	<a href="http://www.kzoo.edu/regist/sip/sip_info.htm">http://www.kzoo.edu/regist/sip/sip_info.htm</a>
Graduation requirements	<a href="http://www.kzoo.edu/advising/degree_req.htm">http://www.kzoo.edu/advising/degree_req.htm</a>

Diebold Symposium April 28-30, 2005

## SIP Deadlines

Review draft	Friday, September 23, 2005
Journal (1 copy, clinical SIPs only)	Friday, September 23, 2005
Final draft (1 bound copy)	Friday, January 6, 2006
Electronic abstracts	Friday, January 6, 2006

Comprehensive Exams Fall 2005

HLSC 490 (Senior seminar) Winter 2006, MWF 11:50-1:05

# The Handbook

---

This handbook will guide you through your final year as a Health Sciences major. In it you will find guidelines and expectations for each stage of your SIP and outlines for review for comprehensive examinations that will prove to be helpful between now and graduation. Keep this book handy while you perform and write your SIP. It contains style guidelines for every section. Pay particular attention to directions for citing references and preparing the bibliography. The Registrar's office also posts SIP guidelines at [http://www.kzoo.edu/regist/sip/sip\\_info.htm](http://www.kzoo.edu/regist/sip/sip_info.htm).

In the fall, you will find the handbook useful in preparing for your comprehensive examinations. Your **first** copy of this handbook is free—please do not lose it. If you misplace your free copy and need to get information from a handbook, you may borrow one from a friend or download it from the Health Sciences web site.

## Health Sciences Personnel

---

Dr. Diane R. Kiino

I am a 1974 graduate of K College (Chemistry) and received my Ph.D. in Pharmacology from Yale University in 1982. I spent most of my professional career performing research in the field of molecular genetics at the Frederick Cancer Research Facility (1982-1985), the Department of Molecular Genetics and Cell Biology at the University of Chicago (1985-1993), and the Biology Department at K (1994-1997). After honing my golf game, I emerged from retirement in 2001 to assume the Director's position upon the retirement of Dr. Sally Olexia who developed the Health Sciences Program. I am a member of the National Association of Advisors for the Health Professions and the National Association of Fellowships Advisors (and the Kalamazoo Women's Golf Association). I also serve as the Executive Director of the Heyl Science Scholarship Fund and am Chair of the Graduate Fellowships Committee.



# Requirements for the Major

---

## Course Requirements

The course requirements for a major in Health Sciences are listed in the *Kalamazoo College Academic Catalog* and on the registrar's web site at <http://www.kzoo.edu/regist/depts/hlsc/>.

## SIP

A college requirement. This may be done in Health Sciences, with ***the approval of the Health Sciences Program***, and up to two Health Sciences units may be earned. If performed under the direction of another department, no Health Sciences credit will be earned. The written report of all Health Sciences SIPs must be submitted to the Director of Health Sciences for final review and evaluation. Making arrangements for your SIP is ***your*** responsibility. Health Sciences SIP credits do not count towards the major.

## Comprehensive Examinations

A college requirement. These are written tests by which the Director assesses whether you have gained a required minimum level of proficiency in the disciplines of biology and chemistry. These are taken Fall Quarter of the senior year. They consist of the ETS Major Field Test in Biology and an American Chemical Society Chemistry Education Exam, two multiple-choice, professionally prepared exams. They cover all areas of general biology and general and organic chemistry. You must pass both exams to meet your graduation requirement.

# Senior Seminar (HLSC 490)

---

Senior Seminar (HLSC 490) is required for the Health Sciences major and is graded CR/NC (pass/fail). **All** components listed below must be completed before you will receive credit for HLSC 490. Although you will not officially register for the course until Winter Quarter of your senior year, some required activities will occur beginning Spring Quarter of the junior year to prepare you for the successful completion of your SIP.

## Spring Quarter, Junior Year

You will be required to submit written reviews of two SIPs (one research and one clinical) from previous years. These will be on electronic reserve for your convenience. Your reviews will be evaluated on a pass/fail basis and are required as part of HLSC 490. You will also be required to attend at least one full session of oral SIP presentations during the Biology Department's Diebold Symposium after which you will submit a written evaluation of one of the talks.

## Fall Quarter

You will take the comprehensive examinations and, if you are doing a Health Sciences SIP, will meet individually with me to review your SIP.

## Winter Quarter

Winter Quarter, you will register for HLSC 490 during which the class will meet regularly (MWF 11:50-1:05). Attendance will be recorded at each meeting of the class. Three or more unexcused absences will result in a NC grade and you will have to repeat the class (and you will not graduate).

Each SIP presentation is refereed by at least two other classmates. Each student practices their oral presentation with the referees whose responsibilities are to suggest improvements. This mechanism helps to ensure conciseness and clarity in the presentations. Each senior major serves as a referee for at least two classmates.

Class time will be devoted to oral presentations of SIPs and study of topics related to health sciences. Guest speakers may also be featured. You will be granted some compensation time for junior spring and senior fall activities.

A Senior Questionnaire will be distributed Winter Quarter asking you about your impressions of the Health Sciences Program, your future plans, *etc.* In order to receive credit for HLSC 490, you will need to complete and return the senior questionnaire to the Director before the end of Winter Quarter.

## Grading policy

HLSC 490 is graded CR/NC. You must satisfactorily complete all assigned activities and have no more than three unexcused absences in order to receive credit.

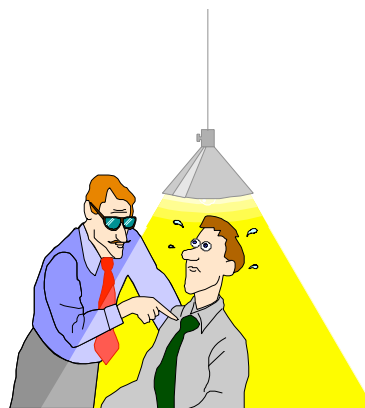
# Comprehensive Examinations

---

The Health Sciences Comprehensive Examinations include the ETS Major Field Test in Biology and an American Chemical Society Chemistry Education Exam in general and organic chemistry. The tests will be administered during the fall quarter of the senior year and will be graded Honors/Pass/Fail. A grade for the comprehensive exam is recorded on the transcript **only** if you earn a grade of Honors for both the Biology and Chemistry exams. This appears on the transcript as "Pass with Distinction."

A comprehensive review of Chem I and II and Organic I and IIA or II will be good preparation for the chemistry exam.

Use the following section as a study guide, along with a good *general biology* textbook, as you review for the comprehensive exams in biology. Other useful materials are the Major Field Test description and sample questions (download from <http://www.ets.org/hea/mft/discipline.html> ) and the GRE practice subject test in Biology (download from <http://www.gre.org/subjectest.html>).



## Review Questions for Biology

1. Distinguish between a plant and an animal.
1. Define an ecosystem.
1. Discuss the flow of energy and nutrients through an ecosystem.
1. Give an example of a food chain.
1. Describe, and distinguish between, mitosis and meiosis.
1. Describe the structure and function of the typical organelles found within a cell.
1. Describe the flow of information within a cell.
1. Describe the structure and function of the major classes of biomolecules.
1. Discuss why most animals require O<sub>2</sub>.
1. Describe the process of photosynthesis.
1. Describe the function of ATP.
1. Describe the early stages and activities of a developing animal and how they relate to later form and function.
1. Describe the basic morphology and physiology of a plant. How does this vary throughout the Plant Kingdom?
1. Describe a physiological system (*i.e.* nervous, circulatory, reproductive, excretory, etc.) and state how this system varies throughout the Animal Kingdom.
1. Define homeostasis and give a specific example. How is this related to a dynamic equilibrium?
1. Describe the process of evolution.
1. Explain what is meant by adaptation. How does this differ from acclimation?  
Can an organism adapt?
1. Define succession and give an example.

1. Distinguish between prokaryotes and eukaryotes.
1. Describe the function of hormones in animals and plants.
1. Define a gene.
1. Describe basic patterns of Mendelian inheritance.
1. Define “species” and discuss how a new species might arise.
1. Describe how materials are conducted throughout a plant. Is this the same for all plants?
1. What is meant by “alternation of generations” with respect to plant life cycles? Apply the concept to a Division of the Plant Kingdom.
1. Discuss one of the systems of classification of living organisms, explaining the criteria used to distinguish between the major groups.
1. Characterize proteins with respect to structure and function.
1. Describe the flow of information among organisms.
1. Describe theories for the evolution of eukaryotic organisms.
1. In your opinion, what is the most important discovery in biology. Please defend you statement.



# The Health Sciences SIP

---

The Health Sciences SIP is open only to declared Health Sciences majors. There are two options for the Health Sciences SIP; the 2-unit laboratory research SIP and the 1-unit clinical SIP. The 2-unit laboratory research SIP typically requires acquisition of several new laboratory skills with a simultaneous expectation of producing useable data, and a more challenging writing process to produce an acceptable thesis.

The clinical SIP should be chosen if you plan to apply to a health professional school and lack experience in a clinical setting.

The SIP is composed of the written thesis and the oral presentation. Each component will be graded Honors/Pass/Fail. The grade appearing on your transcript will be one of the following: Honors (you must receive Honors on **both** the written and oral components), CR (you must pass both components) or NC (you failed one or both components). For a 2-unit SIP, it will also be possible to receive 1 unit CR and 1 unit NC.

## The Laboratory Research SIP (2-unit maximum)

This option should consist of a well-defined **laboratory** research project that you can complete in a ten-week period, working on a full-time basis, in the summer preceding the senior year. Some projects (if not most) may require many extra hours beyond the traditional 40-hour work week. The project should be designed to enable you to gather enough data to answer the question posed. You should, thereby, gain experience working in a research area, setting up experimental rationale, analyzing data and discussing the implications of your experimental results.

You are required to present the College faculty with a thesis upon your return to campus Fall quarter. This thesis is written in the style of scientific publications with the exception that the introduction portion of the paper serves to present enough background in the area and definition of the research problem to be useful to your peers. The literature review should be carried out very early in the SIP quarter if not before. The Introduction and Materials and Methods portions of the thesis can also be written early in the SIP quarter. You are encouraged to request guidance from your research supervisor in reviewing the written product, data analysis and data presentation as well as discussion of the implications of the results.

One copy of your SIP is due the first Friday of Fall quarter. ***This is non-negotiable and failure to meet this deadline will result in a failing grade. This should not be a rough draft.*** It should have been reviewed by your SIP advisor and should be complete with pages numbered, all the data you choose to include in table or figure format with legends, complete citations and bibliography (***minimum*** of 15 original references), and an abstract. Internet citations are not acceptable (with the exception of its direct use in your research). If your SIP is carelessly prepared, containing numerous grammatical and typographical errors, or missing any of the above-named elements, it will negatively impact your final written SIP grade.

I will meet with you during Fall quarter to suggest revisions.

**One bound copy** (official SIP binders are available for purchase in the bookstore) of the final SIP is due the first Friday of Winter quarter. Again, **this is non-negotiable and failure meet the deadline will result in a failing grade.** Finally, you will present your research orally Winter Quarter.

## The Clinical SIP (1-unit maximum)

The clinical SIP is offered for students planning a career in the health professions but lacking exposure to clinical settings. It may take many forms limited only by the student's interests and the availability of opportunities. It should encompass direct patient or client exposure on a full-time basis and active participation or engagement at a level that is appropriate to the student's experience. Two or more part-time positions may be combined to constitute a full-time experience, but this may limit the depth of a student's participation in any one of these compared to full-time participation in a single position.

The student should become involved or knowledgeable about as many aspects of the practice or clinical setting as possible. A required journal, with a minimum of 3 entries per week should chronicle the experience, noting new experiences, impressions, changes in thinking, etc. This will be attached as an appendix to your research paper (see below). The journal does not have to be typed but must be legible. If your handwriting is not legible, type it.

The clinical SIP will culminate with a scholarly review of the literature (30 page **minimum**) on a topic related to the clinical experience. You should choose a well-defined, specific topic, in which there is ample literature published in peer-reviewed professional journals. A well-researched, in-depth discussion will be viewed more favorably than a more superficial discussion of a broad topic. **Use and cite original articles (minimum of 15 original references) rather than review articles. Internet sources are not acceptable.** Your SIP supervisor may be able to suggest an interesting and appropriate topic.

One copy of your journal and paper are due Friday of 1<sup>st</sup> week, Fall Quarter. **This is non-negotiable and failure to meet this deadline will result in a failing grade.** I will meet with the you during Fall quarter to suggest revisions. If your SIP is carelessly prepared, containing numerous grammatical and typographical errors, your final written SIP grade will be negatively impacted.

**One bound copy** (official SIP binders are available for purchase in the bookstore) of your final SIP (review paper with the journal attached as an appendix) is due the 1<sup>st</sup> Friday of Winter quarter. **This is non-negotiable and failure to meet this deadline will result in a failing grade.** Finally, your paper will be presented orally Winter Quarter.



## Electronic Abstract

Abstracts of all Health Sciences SIPs will be compiled into an electronic resource for future students. This separate abstract is due with your final SIP, 1<sup>st</sup> Friday of

Winter Quarter and should be emailed to the Director. These abstracts should be confined to one page, single spaced. Include at the top a title, your name, your on-site SIP supervisor's name, department and institution.

## **Public Presentation**

All Health Sciences seniors will publicly present their SIP Winter Quarter as part of HLSC 490, regardless of the discipline in which it was done. For Health Sciences SIPs, this will be an oral presentation of the laboratory research project or, for clinical SIPs, an oral presentation of the literature review paper. Students electing the clinical SIP may incorporate their clinical experience into their presentation if appropriate. Students may invite guests to their presentation unless it involves proprietary material subject to restricted public access. For SIPs in outside disciplines, an appropriate public format should be chosen in consultation with me.

# SIP Tips

---

## Power labs—buyer beware

Big-name labs at big-name schools may attract your attention but know that as an undergraduate, you will be at the very bottom of the lab pyramid. If it is a large lab with lots of post-docs and graduate students and the principal investigator is a big name, there may be a lot of power issues within the lab. People may consider you a nuisance. If you are hoping to get a letter from this big-name person, they may not get to know you because you will have very little access to them. It could be a miserable experience. Of course, this is perhaps an unfair generalization, but if you are considering such a lab, you would be wise to visit or speak to someone who's worked there before committing yourself.

## Become literate (or don't be a dummy)

Whether you choose a laboratory research or clinical SIP, become familiar with the field before you set foot in the door. Not only will you *appear* smarter, you will *become* smarter. Read some review articles; look up or ask your SIP supervisor for papers that have been generated from that lab. Ask your clinical supervisor to refer you to papers of interest in the field. If you have trouble understanding the papers, ask faculty to help you decipher it. Once you begin your project, the pace will be (or should be) fast and furious and you will be much further ahead if you prepare yourself in advance.

## Be anal

Keep a good notebook. Write everything down, including the source of all reagents, the concentrations of stock solutions you use, units of enzymes you use. Look through the materials and methods section of some published papers from the lab and note the details included. You will need this information if you are writing up your research. The most universal error in SIPs, is the incorrect reporting of centrifugation in “rpm” instead of the correct “x g”. Make a notation of the conversion which is dependent on the centrifuge rotor you use.

## Write on site (2-unit research SIPs)

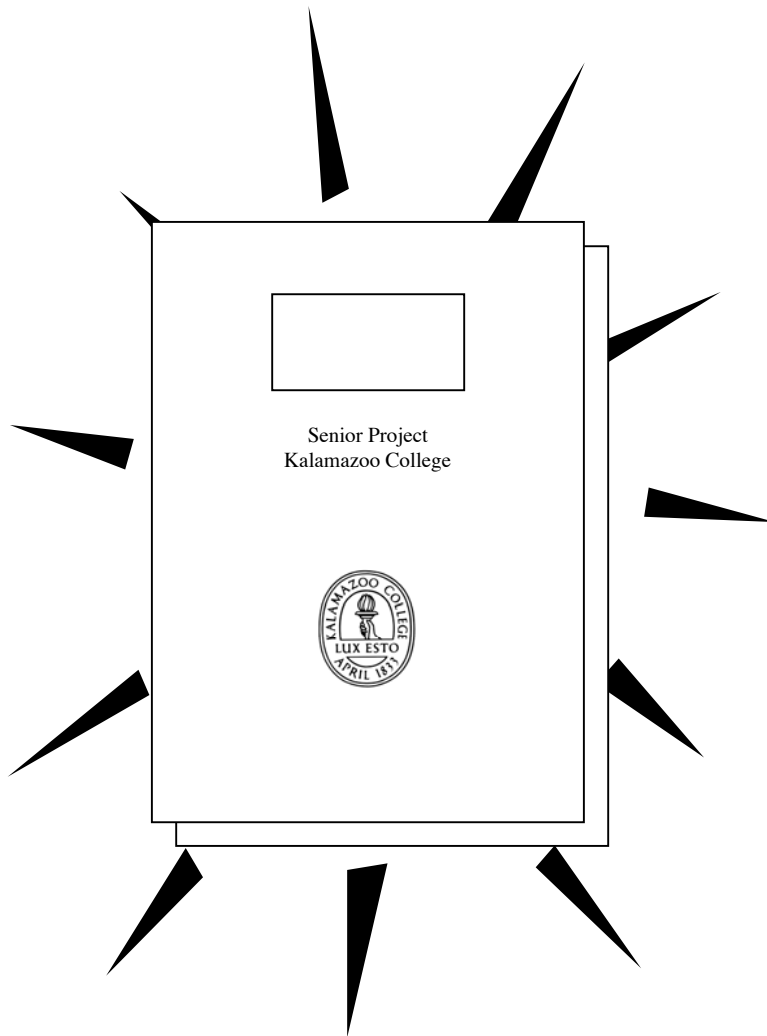
Finish the initial draft of your laboratory research manuscript before you leave the lab. Have someone in the lab read it and offer comments. Revise it and have your SIP supervisor read it and make comments.

This will probably be one of the most challenging writing assignments you have ever had and you will need help in placing information into the correct section, translating lab slang into acceptable terminology, learning standard scientific abbreviations which may be different than those you used in classes, and developing a thorough, consistent, and accurate bibliography. You would be wise to begin writing the introduction and materials and methods before your project is completed and getting feedback on these first.

Provide your SIP advisor with a set of the SIP writing guidelines found in this handbook. Not everyone has exactly the same expectations for the contents and format of a thesis. If your supervisor will edit your thesis with these guidelines in mind, it may save you at least one total revision of the manuscript.

## **Take it with you (all research SIPs)**

**Never** leave your project site without copies of your data. Also make certain that you have illustrations and photographs needed both for the thesis and for your SIP presentation.



# SIP Writing 101

---

The literature review paper written in fulfillment of the clinical SIP requirements, should generally follow the guidelines for the 2-unit research SIP (below) with the exception that there will be no materials and methods, results, or discussion sections. It should have a descriptive title, an abstract briefly describing the contents of the paper, an introduction, a main body which may be divided into sections, and the bibliography. Your journal should be attached as an appendix. References should be cited as described below. If writing is not your forte, consult the Writing services of the Academic Resource Center.



The following instructions describe the scientific paper, and are to be used for writing a Health Sciences SIP. Each section should begin a new page.

Following its title, a scientific paper has six principal sections as follows: Abstract, Introduction, Materials and Methods, Results, Discussion, and Literature Cited. The purpose and contents of each section are described below. Many of the recommendations given here are from Day (1988), to which you are referred for further details.

## Title

The title represents a key aspect of the paper because it serves to alert others to the nature of the work being presented. It should consist of as few words as possible and should adequately describe the content of the paper, to allow someone not familiar with your work to determine the nature of your project.

## Abstract

The abstract is usually a one or two paragraph summary of the paper, stating, in the case of a research SIP, the problem you investigated, materials used, basic methods, major results, and principal conclusions. The abstract should never exceed 250 words, and will often be shorter. Generally, it is best to write the abstract after finishing the rest of the paper.

## Introduction

The introduction should supply the background necessary to enable your peers to understand and evaluate your study or review without having to refer to previous publications, and should provide the rationale for your study. Because your peers will constitute your readership, a broader, more-detailed introduction should be written than typically found in an article which is intended for readers in the field. In your introduction, therefore, you will orient the reader by summarizing pertinent literature in your field, making references to previous studies, and noting similarities and/or differences between previous studies and the work you are about to describe.

This will enable you to provide the rationale for your investigation, outline your major objectives, and state a hypothesis to be tested. Scientific manuscripts differ from other papers you may have written in that they do not use footnotes.

Begin your introduction with a brief overview of your area of study and then progressively narrow the focus of your story, culminating in a statement of your purpose and /or hypothesis. Keep your discussion focused on areas directly relevant to your project.

## **Materials and Methods (research SIPs)**

This section describes what you did in sufficient detail that a trained scientist would be able to repeat your work. Describe your materials precisely, including their degree of purity (*e.g.*, Reagent Grade) and the source of any reagents not commonly available. Identify experimental organisms by *Genus species* (and strain where appropriate), tell where you obtained them, and describe such special characteristics as age, gender, mass, and the conditions under which you maintained them prior to and during the experiment(s). If you followed a stepwise procedure from a laboratory handout, simply identify the purpose of the test, procedure *etc.* and cite the handout as a reference noting any modifications. An excellent reference guide for this section would be a previously written paper or manuscript from your lab.

## **Results (research SIPs)**

This section should contain the data from your study, without interpretation. Use tables and figures to summarize data. Do not present the same data twice in two different figures or a figure and a table. In the text, describe the results, referring to tables and figures by number where relevant. The pages containing the tables and figures should follow their reference in the text as closely as possible. Results from statistical analyses must be used to support statements like “there is a difference between treatment A and treatment B.”

Tables should be numbered consecutively using Roman numerals (*i.e.*, Table I, Table II...) and each should have a descriptive title and legend that doesn't require the reader to refer to the text. Row and column headings should be easily understood. Use footnotes to the table if necessary to provide additional details.

Many kinds of data are best presented as figures, which are given their own consecutive Arabic numbers (*e.g.* Fig. 1, Fig. 2...). Figures may be graphs or diagrams. In graphs, use clear symbols (circles, squares, *etc.*) to mark data points, and draw lines where appropriate to emphasize the trend of the data. Each figure must have a legend that tells the reader what is being presented and explains what the symbols represent. Do not interpret the data in the figure legend; just provide enough information for the reader to understand the figure. Remember, if data are presented as average (mean) values, they must be accompanied by some measure of the variation in the data (*e.g.* standard deviation or standard error). You should include a statement like “Data are presented as mean  $\pm$  standard deviation” in your figure legend to indicate how the data are presented in the figure.

## Discussion (research SIPs)

The purpose of the Discussion is to interpret the data and draw conclusions from them. It should begin with a **brief** synopsis of everything already stated, *i.e.* the purpose, the procedure and the results. The bulk of this section then follows by putting your results into the big picture. What do the results mean in terms of the problem you posed in the introduction? Point out inconsistencies and unsettled points and offer plausible explanations (backed up by proper citations) for discrepancies. Compare your results to previous work. Be sure to explain the reasoning that relates the data to your conclusion. Consider theoretical implications of your study, but do not extrapolate wildly beyond your data. How does your work fit into the literature? What are the future directions of this work?

## Literature Cited (both clinical and research SIPs)

This format is to be used for **all** Health Sciences SIPs. In the text, you should cite published sources of information by giving the author(s) and year of publication (*e.g.* Jones, 1985, for a single author, Jones and Smith, 1986, for 2 authors, or Jones *et al.*, 1987, for 3 or more authors). Cite the source of all facts, methods, and ideas that are not your own. Seek out original articles rather than textbooks. Review articles or book chapters should be avoided but may be cited for the most general of statements.

The literature cited section lists all sources of information ***cited in your text***. ***Do not list sources you may have read for information but did not actually cite in your text***. Give ***full information*** on each reference, listing ***every*** author in the order they are listed in the citation. Note that this differs from the format followed ***within the text*** of your paper in which 3 or more authors are cited as “*et al.*” Single space within each citation, double spacing between each citation. List the citations alphabetically by the first author’s last name, using the following formats:

For a journal article

Author(s). Year. Title of paper (only first word capitalized unless it’s a name, abbreviation, or acronym that is always capitalized). *Journal name* (abbreviated and italicized). volume: first page-last page.

For a book

Author(s). Year. *Title of book*. Publisher, city of publication.

For a paper or chapter from an edited work (book where each chapter is by a different author)

Author(s). Year. Title of paper or chapter. “In:” Editor(s) “(ed)”. *Title of book*. Publisher, city of publication.

In all cases, the name of the first author of a citation is given as — last name followed by initials; all other authors in the same citation are given as — initials followed by last name. Observe punctuation. Items in “ ” should appear exactly in the citation. ***Please see examples of citations below.***

**Do not cite personal communications or unpublished work unless the paper has been accepted for publication**, in which case it is cited as above with “in press” in place of the volume and page number. Unpublished results may be mentioned as such in the text with the word “unpublished” in parentheses after the author’s name.

The Internet, newspapers, popular magazines, pamphlets and other non-peer reviewed publications are not acceptable sources of information. Papers turned in with such citations will be promptly returned and a reduction in the final grade will occur. The only exception to this is when databases (e.g. nucleotide sequences) or other tools (e.g. primer design aids) accessible on the Internet are used directly in your research.

## Correct bibliographic format (examples)

### Literature Cited

Day, R.A. 1988. *How to Write and Publish a Scientific Paper*. 3rd Ed. Oryx Press, Phoenix, New York.

### Other “Handy” References

CBE Style Manual Committee. 1983. *Council of Biological Editors Style Manual: A Guide for Authors, Editors, and Publishers in the Biological Sciences*. 5th ed. Council of Biology Editors.

McMillan, V.E. 1988. *Writing Papers in the Biological Sciences*. St. Martin’s Press, New York.

Norman, C. 1985. *Writing Essays: A Short Guide*. Distributed by the Department of English, Kalamazoo College.

Strunk, W. and E.B. White. 1979. *The Elements of Style*. 3rd Ed. Macmillan Pub. Co., N.Y.

### Other Examples of Citations in a Literature Cited Section

For journal articles

Chomczynski, P. and N. Sacchi. 1986. Single-step method of RNA isolation by acid guanidium thiocyanate-phenol-chloroform extraction. *Anal Biochem*. 62:156-159.

Gabrilovich, D. I., F. Ciernik, D. P. Carbone. 1996. Dendritic cells in antitumor immune responses. *Cell Immunol*. 270:101-110.

For books

Ebel, H.F., C. Bliefert, and W.E. Russey. 1987. *The Art of Scientific Writing: From Student Papers to Professional Publications in Chemistry and Related Fields*. VCH, Weinheim and New York.

For a paper or chapter from an edited work

Day, R.A. 1972. Economics of printing. In: R.A. Day, et al. (ed.) *Economics of Scientific Publications*. Council of Biological Editors, Washington, D.C.

### **Examples of within-text citations**

...Clinical trials have met with only mediocre results, in part because delivery systems are imperfect (Alemany, *et al.*, 1999) [three or more authors use *et al.*]

...Not only do tumors exhibit antigens, but it is also thought that the immune system plays a role in the suppression of tumors in healthy individuals (Janeway and Travers, 1994) [two authors]...

...similar or even identical tumors may follow very different genotypic tumorigenic pathways (Louis, *et al.*, 2001; Golub, 1999) [multiple citations separated by a semicolon; second citation has one author]

# SIP Writing Nuts and Bolts

---

Specific College requirements for the physical appearance of your SIP are found at [http://www.kzoo.edu/regist/sip/sip\\_info.htm](http://www.kzoo.edu/regist/sip/sip_info.htm). Each section (Introduction, Materials and Methods, *etc.*) should begin a new page. For Clinical SIPs, position the Journal **after** the Literature Cited section.

## Margins

Left: 1.5 inches; all others, 1 inch.

## Spacing

Double-space text. Quotations, footnotes, tables and table headings, and figure legends should be single-spaced. Literature cited should be single-spaced with a double-space between entries. Use greater spacing around equations and formulas when they are not embedded in a line of text.

## Pagination

[http://www.kzoo.edu/regist/sip/sip\\_info.htm](http://www.kzoo.edu/regist/sip/sip_info.htm)

## Figures and Tables

Figures and tables should appear as closely as possible to their first citation in the text, which will normally be on the page following the citation. Each figure and table is given a separate page with a legend or heading. If you cite more than one figure and/or table on a given page of text, each of those figures/tables should appear in succession as the immediately following pages. Do not create a break in the text when you cite a figure or table.

Figures are numbered sequentially using Arabic numerals; tables are numbered sequentially using Roman numerals.

## Quotations

Quotations are occasionally necessary for documentation, but should be limited to essential passages and should be single spaced. Unless the quotation is brief and to the point, a paraphrase is preferable. Under most circumstances direct quotations should be avoided.

## Footnotes

You probably won't use footnotes, but should they be necessary, follow these guidelines:

Footnotes should be reserved for presenting explanatory material that will not fit in the text or tables. Indicate a footnote in the text with a superscript after the word or statement annotated. Number footnotes consecutively throughout the manuscript, starting with those on the title page.

## Title page

Follow the instructions at [http://www.kzoo.edu/regist/sip/sip\\_info.htm](http://www.kzoo.edu/regist/sip/sip_info.htm). On-site supervisors should be included on **all** Health Sciences SIPs and be listed ahead of the faculty supervisor (Dr. Kiino). Health Sciences is a Program, not a Department. Year of imprint is your graduation year.

## Binders

SIP binders and labels are available for purchase in the bookstore.

## Labels

Labels should be typed and include, in order, centered, and on separate lines, the title, your name, year of imprint.

### Sample title page

Effects of Beta-adrenergic Catecholamines on Potassium Transport in  
Turkey Erythrocytes

by  
Diane R. Kiino

Advisors:

Dr. Jerry D. Gardner  
National Institute of Arthritis and Digestive Diseases  
National Institutes of Health

Dr. Richard Cook  
Chemistry Department

A paper submitted in partial fulfillment of the requirements for  
the degree of Bachelor of Arts at Kalamazoo College

1974

# Guide to Critical Reading

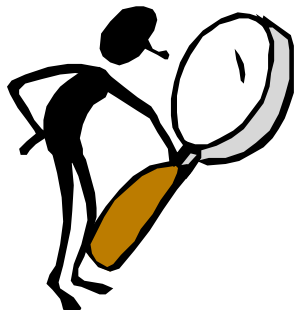
---

Is correct College format used throughout?

## Abstract

Does the abstract tell why, what happened, and so what in one page or less?

## Introduction



What it **should** contain:

Overview

Statement of purpose

Rationale for the approach taken

The significance of the project

Experimental approach

What it **should not** contain:

Extraneous material I do not need to know to understand the project

## Materials and Methods

The most common error writers make is including results in the Materials and Methods section. In Materials and Methods, only state what materials were used and the protocols used. Methods should not read like recipes or the protocols you used in the lab. Compare to a published paper. Could you reproduce the experiments using the information contained in this section? Use correct terminology and abbreviations.

## Results

Does the Results section contain the appropriate material (results without interpretation)?

Are the data presented in a clear manner?

Do you have a better suggestion for presenting this data?

Check the tables and figures. Do the figures and tables have titles and legends?

Is there statistical significance to the data?

Is the statistical significance indicated in the figures?

## Discussion

The Discussion section should return to the results obtained and talk about the significance of these results.

Does the Discussion clarify the meaning of the data obtained?

Are findings compared with those of other researchers?

What's the significance of the findings and how do they fit into the big picture?

Do you know what direction further research in this area could take?

If there were technical problems, has the writer explained the problems and suggested solutions?

## Bibliography

Is the format correct?

Are authors cited in the text found in the Literature Cited and *vice versa*?

# Publicly Presenting Your SIP

---

You will publicly present your SIP during Winter Quarter as part of HLSC 490. To assist your preparation, a peer referee system will be used. To clarify the expectations of the seminar and the role of the referees, the following guidelines are provided. At all times, however, it should be remembered that the ultimate responsibility for the presentation and the preparation is that of the presenter.

Talks should be limited to a total of 30 minutes. To allow time for questions, therefore, the actual presentation should be no longer than 20-25 minutes. The referees should time the talk and suggest ways of fitting what needs to be said into the above time frame.

The speaker should be introduced by one of the referees. The introduction would include information such as:

- Speaker's name
- SIP Location
- SIP Supervisor
- SIP Title



The seminar should be presented in much the same way a paper is written. The introduction is exceptionally important because, if the audience does not clearly understand the objectives of your project, it will be difficult for them to follow the rest of the talk. The methodology should be limited to only that which is important in understanding the data presented in the talk. It may be possible to use a diagram or flow chart to illustrate your methodology so that it may be more easily and quickly understood.

**Do not** present all of your raw data or all the data you collected unless it is itself directly important to illustrate your objectives and conclusions. Also, be sure that any graphs, tables, charts, etc. are easily visualized and not too busy (*i.e.*, containing too much to be readily scanned). The referees can be invaluable here. As individuals not heavily invested in the project, they can determine if the report is clear and coherent and whether visual aids are useful. **The referees should challenge the speaker when they do not understand what is said and assist in clarifying ideas and weeding out unnecessary material.**

The speaker should have a clear command of the subject matter and be able to deliver the presentation smoothly. This requires several practices, **out loud**. Your slides are there to present figures and list key points. **Do not read your slides.**

The referees should be familiar with the presentation and initiate discussion at the end of the presentation. This includes being prepared to ask questions of the presenter if none are forthcoming from the audience. An absence of questions from the audience could be indicative of a poor presentation. The speaker either did not present the topic in a clear manner or failed to generate interest in the subject.

Referees are responsible for making sure room lights are operated according to the needs of the speaker, the slide projector is functioning properly, and the slide projector is turned on and off as needed.

# Honors in the Major

---

Honors in the Health Sciences major, a distinction that is recorded on your transcript, requires a minimum 3.7 GPA in the Health Sciences core sequence and cognates as computed after Winter Quarter of the fourth year. If more than four courses from the Natural Sciences/Mathematics and Computer Sciences Division have been taken outside of the core sequence, the four courses receiving the highest grades will be used as cognates.

After the above criterion has been met, the student must fulfill 2 of the 3 following requirements:

1. An “Honors” grade for both the Biology and Chemistry sections of the comprehensive exams.
2. An “Honors” grade on a Health Sciences written SIP.
3. An “Honors” grade on a Health Sciences SIP public presentation.

From these it can be inferred that receiving honors in the Health Sciences major requires completion of a Health Sciences SIP.

