



Chemistry 4310H: Current Topics in Biochemistry Winter

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Overview: A survey of the questions that are of greatest interest to biochemists. This course will rely extensively on reading and understanding primary literature sources published within the last four years. Students will give presentations in class as part of the course evaluation. Pre-requisite: CHEM 3300H (331H) and 3310H (332H). Excludes CHEM 436H.

Content Delivery and Communication: This will be done mainly through WebCT. Check daily for updates, necessary journal articles, etc. These will be current review and primary source papers. Biochemistry textbooks and notes from previous courses will be useful for review purposes, but will not be explicitly used in class.

Topics to be covered. Given the nature of this course and the scope of biochemistry a complete list of topics is not possible. What follows are a list of topics that will likely be covered in this course, some of which are based on previous years. Be assured that in cases where a topic has been done over several years, we are always on the lookout for the most recent updates.

Quaternary structure and symmetry in protein structure & function.

Protein function without protein structure: A role for intrinsically unstructured proteins.

Origins of Life: What experiments in molecular self-replication and directed evolution can teach us.

Modern techniques in biochemical analysis.

Protein engineering and the expansion of the genetic code: when 20 amino acids and infinite sequence variation just isn't enough.

Applications of bioinformatics to the prediction of diseases.

Cell differentiation as a two-way street: turning differentiated cells back into stem cells.

Cellular signal transduction responses to infection.

Evaluation:

Quizzes (2)	15%
Poster Presentation	20%
Literature Review	30%
Final Exam	35%

Quizzes: Will take place in class and be 50 minutes long. These will cover the material presented in class to that date; the second quizz will cover material since the first one. These will be of the short answer/interpretation variety.

Poster Presentation/Literature Review: You will choose a topic of current interested in biochemistry and subject to my approval. Towards the end of the term there will be two sessions during which you will present your topic in poster format to the rest of the class. The literature review will be on the same topic as the poster and is due within the exam period. See below for further information.

Final Exam: This will be a two hour exam and will be based on material covered in the lectures.

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Format, expectations, and grading for the CHEM 4310H Poster

Poster Requirements (must be present)

- 1) A clear, short title
- 2) An Introductory Panel at the beginning
- 3) A Future Directions Panel at the end, followed by a List of References
- 4) Figures taken from other sources (journal articles, web sites, etc) must be cited. Place the citation of the figure source below the figure itself.
- 5) The text in figures taken from other sources must be legible. If it is not, you must provide new text boxes, placed over the text that is not legible.
- 6) As we can not count on having sufficient wall space the posters will have to be free-standing (see guidelines)

Poster Guidelines

Your poster should accomplish at least two things:

- 1) Catch the eye of people and entice them to stop and read your poster with about 5 seconds.
- 2) Completely inform them of the content of your poster within 3 minutes

This is a challenge, of course. Everyone will have their own ideas about this, so you have more artistic licence here than with your final paper. But here are some suggestions:

- Text should be legible; use a font size no smaller than 24 point, except for references and figure citations.
- Keep the amount of text to the bare minimum. Use simple sentences or point form
- Use figures as appropriate to do what text alone can not.
- The use of Powerpoint to prepare the panels of your poster is not mandatory. However, it will make it easier for you to prepare your poster if you know how to use it.
- Staples carries (according to their web site) a table-top presentation display board (Elmer's Executive Pro Display Board, 36"x48") which costs about \$13. This, or something similar, can be used to make your presentation free-standing.

Poster Grading

Visual Impact of Poster (quality of preparation, sensibility of arrangement)	30%
Poster Content (is sufficient information provided to introduce the topic?)	30%
Meeting of the requirements described above:	20%
Handling of Questions:	20%

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Format, expectations, and grading for the CHEM 4310H literature review paper

Paper Format

Acceptable Fonts: 12-point Times or Times Roman; 10-point Arial or Helvetica

Margins: 1 inch all around (like this document)

Spacing: Double-spaced

Citations in text: Use the Author/Date format, in brackets, eg (Farnsworth *et al*, 2007)

References: List these alphabetically by the first author. Include the names of all authors, the year, the title of the article, and finally the journal name, volume, and pages. Use the following as an example:

Bosron, W.F., Anderson, R.A., Falk, M.C., Kennedy, F.S., and Vallee, B.L. (1977) Effect of magnesium on the properties of zinc alkaline phosphatase. *Biochemistry* 16, 610-4.

Section Headings: Abstract, Introduction, Main Body, References. Use boldface text for section headings.

Outline of the Paper

1. *Title Page:* Include your name and the title of your paper. Use boldface font.
2. *Abstract:* In 200-300 words (no more), provide the context for your paper, indicate what your focus will be, and present the major points of your work. See for example the abstract of the review by Goodsell and Olson, who summarize a 51-page article in 280 words. The abstract comes first in your paper but it is the last thing that you write.
3. *Introduction:* In one to two pages, the introduction indicates what your paper will be about, and why the topic is significant. It starts broad (which provides the context and significance) and then narrows (which provides the focus of your particular paper). The introduction does not require a new page – it comes right after the abstract. It is in the introduction that you will most likely be needing to cite review articles.
4. *Main Body:* This is where you get to grips with the details of the papers you read. The main body does not require a new page – it comes right after the introduction. Use primary source, peer-reviewed research papers published mainly within the past six years. Web pages do not count.
 - a. A superior literature review is not simply a discussion of a bunch of papers in series. Care is taken first in the topics to be considered and in the choice of papers for each of these topics: which papers make a significant contribution to the field of study? What were the *key* techniques used? Do other papers support these findings or not?
 - b. Cite what you write, but do not go overboard. If you are writing a paragraph, and are citing only one reference in it, you need only to put the citation after the first sentence.
5. *References:* Place this on a separate page after the Main Body
6. *Figures:* Place them all in the end. Remember to refer to them in the main body. Each figure should be numbered, have its own legend (use single-spaced font), and its source should be indicated. It is OK to use figures found on the web, but you must give the web address. Figures must be legible, and that includes the text. If you can't read it, don't include it.

The combined length of the abstract, introduction, and main body is to be between 8 to 12 pages

Expectations: *Your review is of the recent, primary literature.* That means peer-reviewed research papers, not other literature reviews (although you can use those to get started). You will need to base your review on at least five such research papers, and probably no more than ten, published within the last six years.

Grading of the paper

10% -Format and Outline of the Paper. How well did you adhere to the guidelines on the previous page? They are not completely arbitrary; all scientific journals have formats that have to be followed precisely, or else your manuscript is returned, unread.

20%-Clarity. Remember the first rule of writing: do not not annoy your intended reader. Is your paper organized in a sensible fashion? Is each sentence clear, and grammatically correct? Do not hand in a first draft and hope for a good mark. Write it, put it aside for a few days, then look at it again. You will be surprised how much room for improvement you find. There will be plenty of time for you to do this (see the due date, below).

70%-Content. How deep do you go into your topic? This is not the same as covering a lot of papers; it is more a matter of you understanding what you are writing about. For example: do you recognize and comprehend the key points and techniques of the papers you are writing about, or are you fixated on minor points? If there is a matter of debate in the field you are talking about, which side do you tend to agree with? Why are the particular journal articles that you are describing significant? Can you relate the information of one paper to the content of others (*ie* see common features, or interesting differences)?

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Academic Dishonesty: Academic dishonesty, which includes plagiarism and cheating, is an extremely serious academic offense and carries penalties varying from failure in an assignment to suspension from the University. Definitions, penalties, and procedures for dealing with plagiarism and cheating are set out in Trent University's Academic Dishonesty Policy which is printed in the University Calendar and on the university web site at: http://www.trentu.ca/deansoffice/policies_dishonesty.php.

Access to Instruction: It is Trent University's intent to create an inclusive learning environment. If you have a disability and/or health consideration and feel that you may need accommodation to succeed in this course, contact the Disability Services Office (BL Suite 109; 748-1281; disabilityservices@trentu.ca) as soon as possible.

Chemistry Departmental Policy on Completion of Course Work: The Chemistry Department considers that completion of all components of a course is necessary for you to be given credit in that course. Therefore, it is the policy of the Department that you must complete, and hand in if applicable, all material associated with each component of the course. This applies equally to work that is handed in or completed too late to earn any marks in the course, in conjunction with the policy of the course instructor on lateness. Students who fail to meet this requirement for reasons that would make it reasonable to assign an incomplete mark for the course should consult the instructor well before on which final marks are due for the course in question. In the absence of an incomplete standing being assigned, you will receive a mark of 0 and an F grade in this course.

SAMPLE