

## What is a *Critical Review*?

A critical review in the context of this class is a **scientific argument** against a conclusion, preferably the main conclusion of a scientific paper **that pertains to any subject covered in the class (see web notes)**.

A **scientific argument** is an argument for an opinion on a scientific subject based on facts (cited in **the literature**), logic, reason (math) and commonly held understandings (cited in **the literature**).

**The literature** includes peer reviewed journal articles, published books and, rarely, direct quotations from well known experts in the field. The literature **does not** include web pages or ungrounded statements (statements not supported by logic, reason or the literature).

The main hurdles in writing a critical review of a paper are to find a paper that pertains to the subjects covered in the class notes and to develop an opinion that differs from that of the authors which you can support using a scientific argument.

- 1) Find a paper that deals with an area pertaining to the class. You could begin with the texts used for the class, Strobl's book, Doi's book, de Gennes's book or Flory's book (old papers). You may find a paper from those cited in these books that appears to be only weakly grounded, for instance Reference 7 of chapter 2 p. 50 in Strobl could be easily critiqued using tools we discussed in class. You could also take a reference from Strobl, for instance reference 9 in chapter 3 p. 67, and do a cross reference search for papers that cite one of these fundamental papers and that has been published more recently by using the Web of Science:  
<http://cite.ohiolink.edu/isi/CIW.cgi>  
or other search engines. You may find a paper that incorrectly applies the logic of reference 9 to conditions where the logic is not applicable such as in concentrated solutions. Such a cross reference search can be extremely powerful in finding a paper for the critique.
- 2) You need to find a paper with which you disagree on one or several points. The best is a paper in which you disagree with the main conclusion.
- 3) You need to formulate a scientific argument explaining why the paper is in error based on the literature (i.e. citing the literature). A scientific argument is usually based on known facts (citing support) and well accepted theories (citing the literature). The facts and theories need to be referenced from the literature.
- 4) In your critical review you should include a copy of the paper being critiqued and copies of all relevant literature used by the authors to support their case and that you used to support your critique of the paper. These copies can be pdf files emailed to me, [beaucag@uc.edu](mailto:beaucag@uc.edu), or hard copies.
- 5) The critique itself can be short, i.e. 1 single spaced page, or could be longer, up to 6 pages if needed. It is crucial to support your opinions and statements with literature citations.
- 6) **The critical review is due 3 weeks following the date a grade you would like to replace was created (or at the start of the final exam during exam week, which ever comes first)**. If you need to replace Quiz 1 (March 28) the critical review is due at the start of

class on April 18. This means you must work fast to turn in a critical review on time, it can not be reasonably done at the last minute since it generally requires some thought and background reading to formulate a scientific argument.

- 7) Each review can replace up to 3 grades but to replace even 1 grade you need a full review.