

Writing a Scientific Paper – Research Report

The research reports in Biology 222 are each worth 10% of your final course grade. Papers are due the week of February 11th, in your lab section. Chapter 11 in Ambrose and Ambrose is a helpful resource for this assignment. All scientific journals also publish specific instructions for scientists submitting manuscripts. We have provided one such set of instructions below as an additional resource for you to consult as you complete this assignment.

The following is excerpted and modified from the Information for Authors section for the journal *Cancer Research*, found at <http://cancerres.aacrjournals.org/misc/ifora.shtml>. *Cancer Research*, a journal of the American Association for Cancer Research, is the most frequently cited cancer journal in the world. Papers are stringently reviewed, and only those that report results of novel, timely, and significant research and meet high standards of scientific merit are accepted for publication.

FORMAT AND STYLE

Papers are to be written in clear, grammatical English and must be typed double-spaced. They should be no longer than four pages using a standard 10-12 point font. Papers that are not in *Cancer Research* style or that are not in good idiomatic English may be returned to the author without review. Laboratory jargon as well as terminology and abbreviations not consistent with internationally accepted guidelines should be avoided.

The AACR journals generally conform to usage guidelines in the CBE Style Manual (Sixth Edition, 1994, published by the Council of Biology Editors, Inc., Northbrook, IL).

Manuscripts should be arranged in the order described below. Please note that all pages of the manuscript must be numbered. Numbered and lettered sections in the text should be avoided. Each table and illustration must be cited in order in the text. Simple chemical formulas or mathematical equations should be presented in a form that allows their reproduction in single horizontal lines of type.

Title. Write a brief, informative title limited, if possible, to about 100 characters. It is important for literature retrieval to include in the title the key words that identify the nature of the subject matter, including, if applicable, the species on which the work is done. Avoid expressions such as "Studies on . . ." or "Observations of . . .", and avoid chemical formulas or abbreviations.

Introduction. Brief reference to the most pertinent papers suffices to acquaint the reader with the findings of others in the field and with the problem or question that the investigation addresses. For the purposes of your Ames test paper, the introduction will rely on lab handouts and a short background on the substance(s) you chose to examine. It should be about 2 paragraphs long.

Materials and Methods. Explanation of the experimental methods should be brief but adequate for repetition by qualified investigators. Procedures that have been published previously should not be described in detail but merely cited as appropriate references. Only new and significant modifications of previously published procedures need complete exposition. The sources of special chemicals or preparations used should be given along with their locations (city and state). The Materials and Methods section will be emphasized in grading your Ames test paper.

Results. Present the results as clearly as possible in one of the following: text, table(s), or figure(s). You may include a concise summary of data presented in tables and figures in the text for this section, however excessive elaboration of data already given in tables and figures should be avoided. Reserve extensive interpretation of the results for the Discussion section. The Results section will be emphasized in grading your Ames test paper.

Discussion. The data should be interpreted concisely without repeating material already presented in the Results section. Speculation is permissible, but it must be well founded, and discussion of the wider implications of the findings is encouraged.

References. Follow CSE-style documentation in your reference list, as explained on pp. 375-384 in *Writing to Influence the Affairs of the World*. Within the text of your paper, use the “author, year” format as demonstrated in Ambrose. The reference list should be limited to only those citations essential to the presentation. For the purposes of the Ames test paper, your reference list will be short, including your lab handout, one to a few references on your test substance, and perhaps your text.

Tables. Tabular material should not duplicate data already presented in detail in the text, nor should tables be only lists. A table should compare values. If you are putting data in a table, summarize the data in the text and reference the table. Authors are obliged to indicate the significance of their observations by appropriate statistical analysis.

Every table must have a descriptive title and enough explanatory information so the reader can understand the data without reference to the text. Each column must carry an appropriate heading and, if measurements are given, the units should be given with the column heading. Number tables using Arabic numerals.

Figures. Line drawings, illustrations, photographs, photomicrographs, and electrophoretic patterns are designated as figures. Figures should be used when salient points need illustration for better comprehension by the reader. Figures must be cited in the order in which they appear in the text.

All figures must have legends that briefly describe the data shown; details given in the text of the paper should not be repeated. Each legend should adequately identify all parts, symbols, abbreviations, mathematical expressions, abscissas, ordinates, units, and reference points on the figure. Abbreviations explained in the text of the article need not be re-explained in the figure legend.