# Organization of the report

Be selective in the data that you present. It is not necessary or desirable to present every experiment that was performed. Choose those that best fit with the goals of the project.

1. Formatted for standard 8.5-by-11-inch paper.
2. Double spacing throughout.
3. One-inch left and right margins.
4. Text typed in 12-point Times New Roman.
5. Number all pages, including those with figures.
6. Submitted as a PDF file.
7. Length NOT TO EXCEED 10 pages (BCH373/375) or 14 pages (BCH473), not including references and figures.

Your report is to be arranged in the following order:
(a) title and author
(b) capsule
(c) abstract
(d) introduction
(e) experimental procedures
(f) results
(g) discussion
(h) acknowledgements
(i) references
(j) tables
(k) figures, one per page, with legend included on each.

# Text

## Title section

It is important that the major findings of your study are intelligible to all knowledgeable biochemists, including those who are not specialists in the field. The title should be as short and informative

as possible. If acronyms or abbreviations are used, the name/term should be first indicated in full followed by the short form/acronym (e.g., Visualization of Polarized Membrane Type 1 Matrix Metalloproteinase (MT1-MMP) Activity in Live Cells by Fluorescence Resonance Energy Transfer (FRET) Imaging.) A full name is not required for the most common biochemical abbreviations (e.g. ATP). Please review your title and abstract carefully to make sure they convey your essential points succinctly and clearly.

## Author

This is you. Include your student number, the course name, and the date. Since the report is supposed to reflect your work during the course, do not include other authors. Contributions of other researchers to the work in your report should be explicitly acknowledged in the 'Acknowledgements' section after the 'Discussion'.

## Capsule

A "Capsule" reports the core findings of a paper in a way that makes clear to all readers how those findings advance the understanding of a biological process.

### How to write the Capsule

Using language with which all readers are familiar will make the findings accessible to a broad scientific community and to the general public. The Capsule and the abstract have quite different purposes and audiences, so the Capsule is not simply a truncated version of the abstract.

A Capsule should have 60 words or less and four parts that communicate the following to readers of all levels of interest and expertise:

1. Background: A complete sentence that explains the impetus and context of the work.

2. Results: A complete sentence that summarizes the major findings.
3. Conclusion: A complete sentence that summarizes the interpretation of the findings.
4. Significance: A complete sentence about the report's impact on the field and its long-term implications.

Please note that each component of the Capsule should add another layer of information, not repeat what already has been said.

After the Capsule is written, it may be helpful to do the following:

- Honestly answer this question: "Will readers walk away from what you've written with a clear understanding of what you've found and its significance?" If your answer is "no" or "maybe," it's probably best to begin again.
- Ask a nonspecialist to read your draft "Capsule" to make sure that it is clear and communicates the essence of your paper to a general reader.

**Example 1**

- Background: Amyloid fibrils are protein aggregates associated with numerous neurodegenerative diseases.
- Result: A theoretically consistent, two-parameter model is proposed describing very distinct amyloid fibrillization kinetics.
- Conclusion: Amyloid fibril formation takes place by a general mechanism involving supersaturation-dependent nucleation and growth steps.
- Significance: This mathematically simple model is expected to be routinely used to characterize the action of new targets for disease therapeutics.

**Example 2**

- Background: Galectins from peritoneal cells of conger eel contribute to the encapsulation of nematode.
- Result: A new galectin from peritoneal cells, congerin P (Con-P), shows unusual sequence, specificity, and allosteric regulation by mannoside.
- Conclusion: Con-P is a new type of galectin with allosteric carbohydrate-binding ability.
- Significance: Con-P is the first known lectin allosterically modulated by its ligands.

**Example 3**

- Background: Metabolite binding to riboswitch RNAs regulates expression of metabolic genes.
- Result: Inhibitory and activating ligands interact with the same riboswitch.
- Conclusion: Riboswitches integrate information about the overall metabolic state of the cell.
- Significance: This might be the first sign of a complex RNA-metabolite interactome.

## Abstract

- Should succinctly and clearly describe the major findings reported in the report
- Must not exceed 250 words

## Introduction

- Presents the purpose of the studies reported and their relationship to earlier work in the field
- Should not exceed three double-spaced pages

## Experimental procedures

- Brief but sufficiently complete to permit a qualified reader to

repeat the experiments reported and to understand the experiments without reference to secondary sources
- Cite standard techniques in the references

## Results

- Describe the results presented in the figures and tables

## Discussion

- Concise (usually less than four double-spaced pages)
- Focused on the interpretation of the results rather than a repetition of the "Results" section
- Include comments on alternative approaches (if your approach was not successful)
- Include discussion of future directions that your study could take

## References

- Cited in text by number and not by author, title, and/or date
- Titles should be included in references
- Numbered consecutively in the order of appearance
- References for journals and books should be in the following styles:

1. MacDonald, G.M., Steenhuis, J.J., and Barry, B.A. (1995) A difference Fourier transform infrared spectroscopic study of chlorophyll oxidation in hydroxylamine-treated photosystem II. J. Biol. Chem. 270, 8420–8428

2. Sambrook, J., Fritsch, E.F., and Maniatis, T. (1989) Molecular Cloning: A Laboratory Manual, 2nd Ed., Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

3. References appearing as e-pubs should be in the following style: Aphasizheva, I., Aphasizheva, R., and Simpson, L. (April 1, 2004)

RNA editing terminal uridylyl transferase 1: identification of functional domains by mutational analysis. J. Biol. Chem. 10.1074/jbc.M401234200

4. Farrell, C. (1992) The Role of SecB during Protein Export in Escherichia coli. Ph.D. thesis, The Johns Hopkins University

### Miscellaneous

- Abbreviations used in the text must be defined in brackets immediately after the first abbreviation is cited. If an abbreviation doesn't appear at least three times in your report, don't use it. The abbreviations of some important biochemical compounds, e.g. ATP, NADH, DNA, and amino acids in proteins, need not be defined. Names of enzymes are usually not abbreviated except in terms of the substrates for which there are accepted abbreviations, e.g. ATPase and RNase. Use of non-standard abbreviations will make your report less readable, so avoid them.

## Tables and figures

The number of tables and figures used to present data essential to illustrate or prove a point are limited to FIVE total (BCH373/375) or EIGHT total (BCH473). Multipanel figures are acceptable, but none should exceed a single page, including legend.

Tables should have titles and sufficient experimental detail in a legend immediately following the title to be understandable without reference to the text. Each column in a table must have a heading, and abbreviations, when necessary, should be defined in the legend.

Figures should have titles and legends containing sufficient detail to

make the figure easily understood. Legends should appear below each figure, on the same page. Appropriately sized numbers, letters, and symbols should be used so they are no smaller than 2 mm. Numbers, letters and symbols used in multipaneled figures must be consistent. The abscissa and ordinate should be clearly labeled with appropriately sized type, and units of measurement must be given. Scales for plotting the data should be marked by short index lines, but every index line need not be numbered. Use standard symbols found in Microsoft Word with symbols and curves identified in the legend or on the figure. Indicate the figure number on each figure.

While image manipulation is often desirable for clarity and/or brevity of presentation, manipulation for deceptive purposes either to unfairly enhance or eliminate or otherwise obscure data is misconduct.

From The Journal of Cell Biology:
"No specific feature within an image may be enhanced, obscured, moved, removed, or introduced. The groupings of images from different parts of the same gel, or from different gels, fields or exposures must be made explicit by the arrangement of the figure (e.g. using dividing lines) and in the text of the figure legend. Adjustments of brightness, contrast, or color balance are acceptable if and as long as they do not obscure or eliminate any information present in the original. Nonlinear adjustments (e.g. changes to gamma settings) must be disclosed in the figure legend."

This organization scheme was adapted from *JBC*'s Instructions to Authors, January 2013.