

Manuscript Assignment (BIO 3120) (15% of Final Grade)

Due on December 4
(through Turnitin – see syllabus for instructions)

Rationale:

As scientists we are often put into situations where we inherit data from those before us. This presents a challenge as we need to figure out what the previous researcher did (using their notes and information from a common colleague or advisor). We are also frequently asked to write or contribute to manuscripts for publication, which must be prepared according to strict guidelines, submitted and then often re-submitted to address comments from the editors. This assignment is meant to introduce you to the manuscript process and familiarize you with the 'behind the scenes' of scientific articles.

Description:

A gene encoding for the enzyme amylase from a mouse (*Mus musculus*) was isolated and sequenced by a former graduate student from my lab named Maurine Day (fictional). She also did some enzyme characterization work as well.

I want you to prepare a manuscript for publication based on Maurine's work. It should follow the instructions by the journal **Cell** and it may include (but is not limited to) the following data:

- Nucleotide sequence of the amylase gene (see D2L folder "Manuscript Assignment" for the sequence file)
- Amino acid sequence of the protein
- Molecular weight (MW) of the protein in kilodaltons (kDa)
- Optimal pH of the protein (see Maurine's Data Sheet on D2L)
- Optimal temperature (see Maurine's Data Sheet on D2L)
- BLAST sequence similarities

Online resources may be used to generate some of the information (e.g. pI, MW, amino acid sequence). We will visit the **Booth Library (Room 4450) on September 10, 2015** during the lab period so that we can go over some of these tools and become familiar with literature searches. Useful websites include (but are not limited) to the following:

<http://www.ncbi.nlm.nih.gov/>
<http://blast.ncbi.nlm.nih.gov/Blast.cgi>
<http://expasy.org/proteomics>
<http://web.expasy.org/translate/>
http://web.expasy.org/compute_pi/

Instructions for Manuscript Preparation (*i.e.* Instructions for Authors)

(modified from <http://www.cell.com/authors>)

The body of the manuscript should be **double-spaced** with **12 font** text (Times New Roman or Arial), in **past tense** and **without personal pronouns** (e.g. We, I), and each page should be **numbered**. The layout should **include the following sections in this order**:

Title:

Titles can occupy **no more than three lines of type**. Each line should contain **no more than 38 characters, including spaces**. The title should convey the conceptual significance of the paper to a broad readership.

Authors/Affiliations:

Author names should be spelled out rather than set in initials. Authors should be **footnoted** to corresponding affiliations. Affiliations should contain the following core information: **department(s); institution; city, state/region, postal code; country**.

Contact:

The contact line should include the **email address** of the **corresponding author (that's YOU)**. The published corresponding author is responsible for ensuring adherence to all editorial and submission policies and for any communications that may result after publication. One corresponding author is preferred, but two are allowed. The **Title, Authors/Affiliations and Contact should be together on the first page**.

Summary:

The Summary consists of a **single paragraph of fewer than 150 words**. It should clearly convey the conceptual advance and significance of the work to a broad readership. In particular, the abstract should contain a brief background of the question, a description of the results without extensive experimental detail, and a summary of the significance of the findings. References should not be cited in the Summary.

Graphical Abstract:

A graphical abstract should allow readers to quickly gain an understanding of the main take-home message of the paper and is intended to encourage browsing, promote interdisciplinary scholarship, and help readers identify more quickly which papers are most relevant to their research interests. Examples of this feature can be seen in the online version of articles published in Cell from January 2010 onwards. Preparation guidelines: A graphical abstract should be **one image** and should not contain multiple panels; visualize one process or make one point clear; have a clear start and end, preferably 'reading' from top to bottom or left to right, for ease of browsing; try to reduce distracting and cluttering elements as much as possible; and provide a visual indication of the biological context of the results depicted (subcellular location, tissue or cell type, species, etc.). **A simple label** is required. Specifications: the maximum size of the image should be 400 x 400 pixels, using Arial font with a size of 12–16 points. Preferred file types are .jpg or .tif.

Highlights:

Highlights are a short collection of bullet points that convey the core findings of the article. Specifications: **3 bullet points** should be included; the length of an individual bullet point should **not exceed 85 characters (including spaces)**; only the core **results** of the paper should be covered. The **summary, highlights and picture (graphical abstract) should be together on the second page (use the third page as well if you need more room)**.

Introduction:

The Introduction should be succinct, with no subheadings, and should present the background information necessary to provide a biological context for the results. This section should at least provide information about the organism (*i.e.* *Mus musculus*) and the family of proteins (*i.e.* amylases), contain a literature review of this family of enzymes and/or mice, and describe why it is important to study these enzymes and/or this organism.

Results:

This section should be divided with **subheadings**. Include references (e.g. Figure 1 shows...) to any Tables and Figures you choose (**3 minimum total**). Figures/Tables must have corresponding captions/titles and be presented according to the journal instructions - **at the end of the manuscript in their own section** (i.e. NOT embedded in the Results section. The narrative should be matter-of-fact (e.g. this was observed, the maximum was this). Remember, the Tables and Figures are listed separately at the end of the manuscript (see details below).

Discussion:

The Discussion should explain the significance of the results and place them into a broader context. It should not be redundant with the Results section. This section may contain subheadings and can in some cases be combined with the Results section. You should describe what you found and what it means. When possible, discuss your findings/conclusions in the context of what has been done previously.

Experimental Procedures:

The Experimental Procedures should, at minimum, include enough detail to allow the reader to understand the general experimental design and to be able to assess the data presented in the figures. This section should also include a description of any statistical methods employed in the study. You should describe as best as possible what Maurine did (extraction procedure etc.) and what you did (the programs that you used etc.) – of course, **do not actually record in the manuscript who did what**. Separate the work by headings (e.g. “DNA Isolation”).

References:

References should include only articles that are published or in press. Note: **"et al." should only be used after ten authors**. Please use the following style **EXACTLY** for references:

Article in a periodical: Sondheimer, N., and Lindquist, S. (2000). Rnq1: an epigenetic modifier of protein function in yeast. *Mol. Cell* 5, 163–172.

Article in a book: King, S.M. (2003). Dynein motors: Structure, mechanochemistry and regulation. In *Molecular Motors*, M. Schliwa, ed. (Weinheim, Germany: Wiley-VCH Verlag GmbH), pp. 45–78.

An entire book: Cowan, W.M., Jessell, T.M., and Zipursky, S.L. (1997). *Molecular and Cellular Approaches to Neural Development* (New York: Oxford University Press).

Reference a **minimum of 8 peer-reviewed publications** (no Wikipedia/Encyclopedias, avoid textbooks, avoid webpage content). I suggest using the Google Scholar search engine (<http://scholar.google.com/>) and/or the Booth Library search engines and typing in keywords such as “*Mus musculus*” and/or “amylase” to get started. You may find other keywords useful as well.

<http://booth.library.eiu.edu/subjectsPlus/subjects/guide.php?subject=BIO3120Manuscript>

Figure Legends:

Legends should be included in the submitted manuscript as a **separate section (at the end of the manuscript)**. Each figure legend should have a **brief caption below the figure** that describes the entire figure without citing specific panels, followed by a description of each panel. For any figures presenting pooled data, the measures should be defined in the figure legends (for example, data are represented as mean \pm SEM).

Tables:

When creating a table, please use the Microsoft Word table function and do not place an Excel table in a Word document. Word tables should not be tab or space delineated and should not use color. Tables should include a **title**. Include tables in the submitted manuscript as a **separate section (at the end of the manuscript)**.