Biochemistry 302 Project 2023
PRACTICAL REPORT INSTRUCTIONS

Background

In Biochemistry 301 you did a series of tutorials, assignments and practicals in which the overall aim was to use the plasmid pGEX4T-1 to express glutathione S-transferase (GST) in *E. coli* and purify the protein using glutathione affinity chromatography. In Biochemistry 302 you performed an additional series of experiments to characterise the purified GST. Here we provide instructions for writing the practical report. In the instructions for the individual practicals we have already given you some guidelines for how to present and discuss your results. But note that you don't have to strictly follow those guidelines – if you wish to add alternative ways to present and discuss your results in your report, please feel free to do so.

Instructions

The report should be written with 1.5 line spacing and a size 11 font.
At the top of the first page, indicate your name and student number, followed by the title of the report: "BCH302 Glutathione S-transferase project report"
The report should contain the following sections:

ABSTRACT (10 marks)

An abstract summarises the work done in a project, so that the main findings of the project can be easily determined by a reader. It should include a brief statement of the objectives of the experiments, a brief description of the methods used and results obtained in the experiments and the conclusions that could be made.
It should not exceed 250 words.

INTRODUCTION (15 marks)

A review of the background of the project, which could include a literature review of GST and the methods used. You already wrote an introduction for your BCH301 project report, which can be used and modified for this report. At the end of the introduction, indicate the experimental objectives of the project (this can be done in bullet point form).
It should not exceed 1000 words (approx. 2 pages)

METHODS (15 marks)

Describe the methods you used for your experiments (you can use sub-headings for different experiments). The methods need to be written as paragraphs (in the style of a journal article), not copied and pasted from the practical instructions. Note that, for example in describing the enzyme assays, it is more scientifically correct to give the final concentrations of the reagents in the reaction, rather than the volumes pipetted (*as an example, rather than stating: "To perform the LDH assay, 10 µL of 10 mM lactate and 20 µL of 1 mM NADH was pipetted into 970 µL buffer", you could state: "To perform the LDH assay, lactate and NADH was added to buffer to final concentrations of 0.1 mM and 0.02 mM, respectively"*). Normally, when writing methods for journal articles, one would often provide a list of the reagents used and their suppliers under a separate heading, but that may be omitted for this report. **Please note that the methods section is written in the past tense.**

RESULTS (35 marks)

Report the results you obtained. Sub-headings may be used for the different experiments. Students often spend considerable effort presenting figures of the results, but neglect to write a results "narrative" (description of the results). Ideally, the way in which the results of an experiment are written up are as follows: start with a brief statement of the purpose of the experiment, followed a brief description of how the experiment was done (this could be one or two sentences – not re-writing the methods in the Methods section), followed by a description of the results (by referring to a figure), followed by a brief statement of the conclusion(s) you could draw from the results. Figures should be numbered and should contain figure legends, including a title for the figure, e.g. "**Figure 1: GST activity assay**. GST was added to PBS buffer containing 1 mM CDNB and 2 mM reduced L-glutathione to a final concentration of 5 µg/mL and Abs340 measured for 5 min at 30 s intervals."

Please note that the results section is written in the past tense.

DISCUSSION (20 marks)

The Discussion is often the most difficult part of a project to write. It usually starts with a brief summary of your main findings. Some suggestions of what to include in the discussions are given in the practical instructions. Additional guidelines of what you could consider including in this section are the following:

1) Critically evaluate your experiments: Did the experiments work and how accurate are your results? Is there a way you could have improved the experiments?

2) Are there alternative methods you could have used to do the experiments (to achieve your objectives)?

3) How do your results compare to published results?

4) Can you suggest additional experiments that could be done in future to characterise your enzyme?

REFERENCES (5 marks)

The referencing format is the same as for your Biochem 301 report. It is as follows:

INTERNET REFERENCES ARE NOT ALLOWED

All references should be cited in the text and listed in a reference section using the Harvard system, according to the following instructions:

IN TEXT REFERENCING:

References are included in the text at the end of the paragraph or sentence that refers to the reference. There are different formats depending on the number of authors, as indicated follows:

Single author: (First author surname, Publication date)

E.G. The mSTI1 protein is the murine version of the human protein, Hop (Smith, 1997).

Two authors:(First author surname and Second author surname, Publication date)

E.G. The mSTI1 protein is the murine version of the human protein, Hop (Smith and Brown, 1997).

More than 2 authors: First author surname et. al., Publication date)

E.G. The mSTI1 protein is the murine version of the human protein, Hop (Smith et.al., 1997).

REFERENCE LIST

Alphabetical according to the surname of the first author. Examples for different types of references are given below:

Book: Single author

AUTHOR SURNAME, INITIALS. Date. Title: subtitle. Place: Publisher. E.G. CHASE, Jennifer A. 1979. Advertising: the hits and myths. New York: Doubleday.

Book: Multiple authors

AUTHORS SURNAME, INITIALS. Date. Title: subtitle. Place: Publisher.E.G. HENDERSON, R.S., SMITH, P.G., ROSSITER, I. & KING, P.Q. 1987. The tenets of moral philosophy. New York: Van Nostrand.

Article: Journal has a volume number and an issue number

AUTHORS SURNAME, INITIALS. Date. Title of article. Title of journal, volume of journal (number of issue): page reference, date of issue. E.G. KLIMOSKI, R., & PALMER, S. 1993. The ADA and the hiring process in organizations. Consulting psychology journal: practice and research, 45(2):10-36.