

ENZYME LAB

Labs and Lab Reports:

One important activity involved with learning the content and skills associated with biology is doing laboratory work. Laboratory and field investigations are incorporated into this course to provide you with a platform to analyze and explore the ideas you are learning in class at greater depth. Following each lab, you will be expected to create a formal lab report using an IMRAD format, which is used in virtually all primary research articles in the biological literature. The IMRAD acronym refers to the following sections: Introduction, Methods, Results, And Discussion. Use the descriptions of each section below to assist you in preparing your lab report.

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INTRODUCTION:

This section supplies background information and may also provide a theoretical basis and historical context for the work done in the lab. To do this, it may be necessary to cite information that has been published in research articles or books. A good Introduction indicates why the work was undertaken and why it is interesting. Toward the end of this section you should explicitly state your hypotheses or objectives.

METHODS (also called MATERIALS AND METHODS):

In this section you will describe the procedures that enabled you to collect your data. A simple listing of "materials" is inappropriate. Ideally, you should include the details that would permit someone to repeat your work based on their reading of this section. For most labs, the methods will come from a lab manual handout. The degree to which your manual/handout may be used for citing methodology is up to your instructor. Avoid insignificant details such as the name of the company that made your pipette or the day of the week on which your lab occurred. The predominant verb tense in this section is past tense. The METHODS section is often the most straightforward to write and is therefore a good place to begin your report.

RESULTS:

This is the core of the report in which you present your findings, usually in the form of numerical data. Sometimes raw data may be presented, but it is more common and useful to provide data that have been condensed to some degree. Tables may be needed to organize large groups of numbers. Figures (graphs) can be particularly useful to display trends in data. It is not enough, however, to simply refer readers to tables and figures. Results must be verbally expressed in the Results section. All of your data are not equally important. Draw the reader's attention to particularly noteworthy data or the presence of meaningful trends. The text of the Results section should summarize the data, but stop short of interpreting their meaning or drawing major conclusions about their importance.

DISCUSSION:

Interpret your data and evaluate the meaning of your results. Was your hypothesis, as stated in the Introduction, supported by the data? Don't be afraid to report "negative" data (e.g., lack of relationships among variables). In some cases, negative outcomes are more interesting and important than positive and predictable findings. If your data seem anomalous or unreasonable, provide reasons that might help explain this. If possible, connect your findings with the results from published studies by using literature citations. Do your results contradict, reaffirm, or extend previously published findings? How do your results fit into the big picture? Resist the temptation to

discuss every aspect of your data and do not provide every conceivable explanation for the obtained results. Speculation should be limited and clearly identified as your own speculation. The last paragraph of this section should be a strong statement of the take-home message.

LITERATURE CITED:

All citations that appear in the body of your lab report must be listed in this section. We will use the author-year format to arrange the citations. List the papers in alphabetical order based on the first author's last name. Unfortunately, there are many ways of formatting citations. As a matter of convenience and consistency, we will arbitrarily adopt the MLA format found in your student handbooks.

Lab Activity:

Introduction

The brown color, which usually develops when a potato or apple is cut or bruised, is the result of a chemical catalyzed by several enzymes. One of the most important of these enzymes is catecholase (catechol oxidase or polyphenol oxidase). This enzyme is brought into contact with its substrate, catechol, when cells are ruptured and exposure to air (oxygen) resulting in the oxidation of catechol to the brownish colored benzoquinone.

Procedure

1. Prepare catecholase by thoroughly blending potatoes (15 g/100 ml of water) in distilled water. Filter through cheese cloth. Put filtrate in dropper bottle.
2. Fill each of two test tubes 1/4 full (3 ml) of distilled water.
3. Add 10 drops of catechol to each tube.
4. Add 10 drops of potato extract to one tube, label C.
5. Add 10 drops of distilled water to the unlabelled test tube. Mix.
6. Note and record color of each tube at 1-minute intervals for 5–10 minutes.

Lab report is due Friday, September 6th. Be sure to research and note in your discussion section why this reaction is so important to the life of plants such as potatoes and apples.