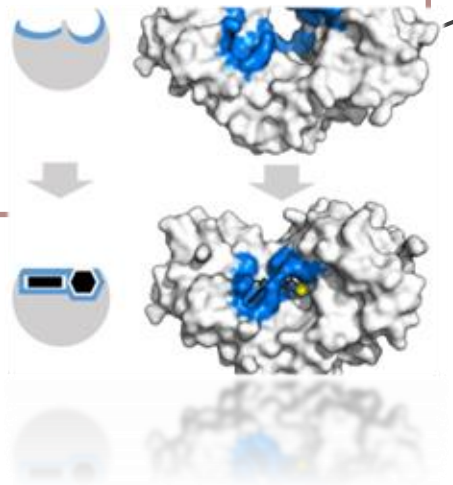
Experimental Enzymology BCH 322 [Practical]

Lab (0) Introduction



Marks Distribution

Task	Marks
Conducting the experiment	5 marks
Report	15 marks
Quiz	10 marks
Midterm	30 marks
Final	40 marks
Total	100 Marks

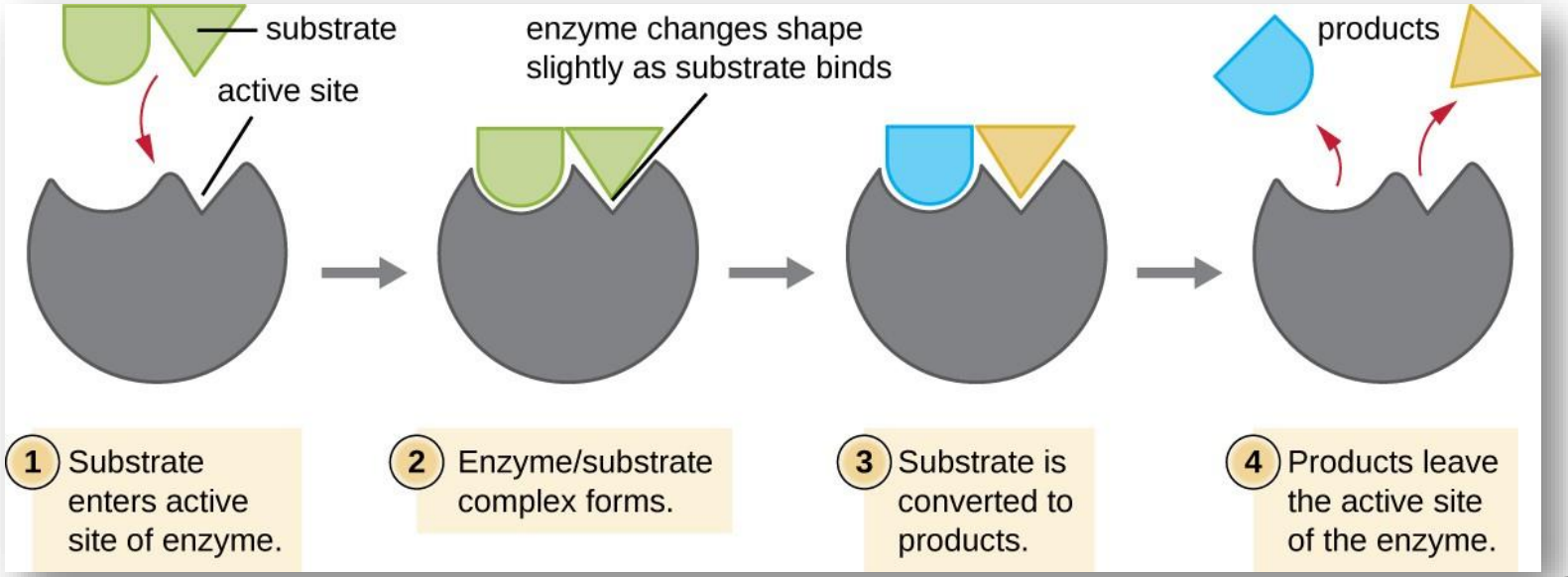
Exams dates:

Midterm exam: March 2nd, 2026

Final exam: …

The Aim of The Course

1. How enzymes work and the specificity of the enzyme
2. To understand how to characterize an enzyme



Course Outline

	Content	Date
1	Some Factors Affecting Polyphenol Oxidase Activity	2 Feb
2	Methods of Enzyme Assay	9 Feb
3	The Effect of Incubation Time on the Rate of an Enzyme Catalyzed Reaction	16 Feb
4	The Effects of Temperature on the Rate of an Enzyme Catalyzed Reaction	23 Feb
Mid-term		**2 Mar**
5	The Effects of Enzyme Concentration on the Rate of an Enzyme Catalyzed Reaction	30 Mar
6	The Effects of pH on the Rate of an Enzyme Catalyzed Reaction	6 Apr
7	The Effects of Substrate Concentration on the Rate of an Enzyme Catalyzed Reaction	13 Apr
8	The Inhibition of Acid Phosphatase by Inorganic Phosphate	20 Apr

Writing a report

⇒ **1st Writing style:**

Font: Times New Roman. **Size: 12** for text and **14** for subtitle. The space between line is **1.5.** The text must be **justified**.

⇒ **2nd Report content:**

1. Cover page

Logo of uni. & dep. – report title – course name and code – students names – date of submission.

2. Table of content

The utilization of AI is highly **forbidden**

جامعة الملك سعود
King Saud University
كلية العلوم
قسم الكيمياء الحيوية

King Saud University
College of Science
Department of Biochemistry

Title of the experiment

BCH 000

Prepared by:
Name 4411111
Name 4411111

Writing a Report

3. Introduction

A background that helps to understand your topic should be written. The information in the introduction must be cited. (100-200 words depending on the topic)

4. Objective/s

Write it using your own words, make it specific.

5. Materials and methods [Write it using a passive tense i.e ***Add*** *5ml of Benzidine solution* → *5ml of Benzidine solution* ***was added***].

Introduction

migration rate of RNA through agarose gels depends on the following parameters: size of the RNA molecules, the concentration of agarose gel, and voltage applied [7].

References

7. Surzycki, S., *Basic Techniques in Molecular Biology*. 2000, New York: Springer.

Writing a Scientific Report

A very nice guide to writing a scientific report
https://phoenixcollege.libguides.com/LabReportWriting

6. Results

- You should report all the results that you get from your experiment. Any **tables**, **figures** or **calculations**.
- You MUST write the **legend** of tables and figures details as shown below

7. Discussion

Introduce your discussion, summarize key results, and write reasons for why you got your results, if unusual results were obtained, they must be explained and suggestions must be offered.

8. References

Endnote, Mendeley or Cite This For Me: Web Citer (*extension in Google Chrome*).

Table number **Table legend**

Table 2. Effects of Lipofundin 20% on hepatic lipid peroxidation biomarkers.

Biomarkers	Control group	Lipofundin group
MDA (µmol/L/mgPr)	3.89 ± 0.75	7.63 ± 0.31*
TH (µmol/L/mgPr)	35.27 ± 4.22	67.32 ± 5.89*
PP (µmol/L of MDA/mg Pr)	5.06 ± 0.48	9.74 ± 0.42*

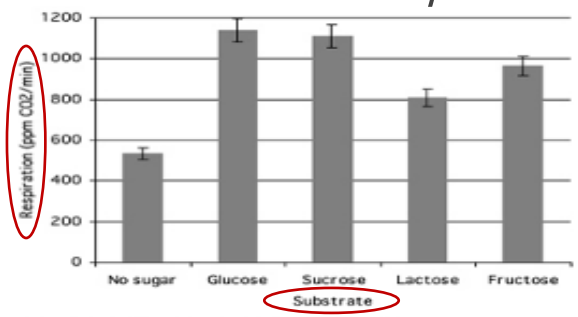


Figure 1. The Effect of Substrate on Yeast Respiration.

Figure number **Figure legend**

Lab Safety

- You must wear a **lab coat, gloves, goggles,** and a **mask.**
- **Open-toed shoes** must not be worn because they cannot protect you against chemical spills.
- **Long hair** should be tied back to avoid any interference with the experiment.
- In case of **acid or base contact with your skin,** wash it with a large amount of clean, cold water and inform the instructor immediately.
- Do not **eat, drink, or chew gum** in the laboratory.
- **Do not depart from the lab,** leaving an experiment unattended. If you need to leave the lab you must inform your instructor before leaving the lab.
- You must **wash your hands** with soap before and after finishing the experiment.
- After finishing the experiment, **clean all glassware** and **work bench.**

Class rules (Must follow!!)

🙋♀ You're more than welcome to ask questions/ seek for help.

🙅♀ You're NEVER allowed to copy (assignments/quizzes and exams) from previous students.

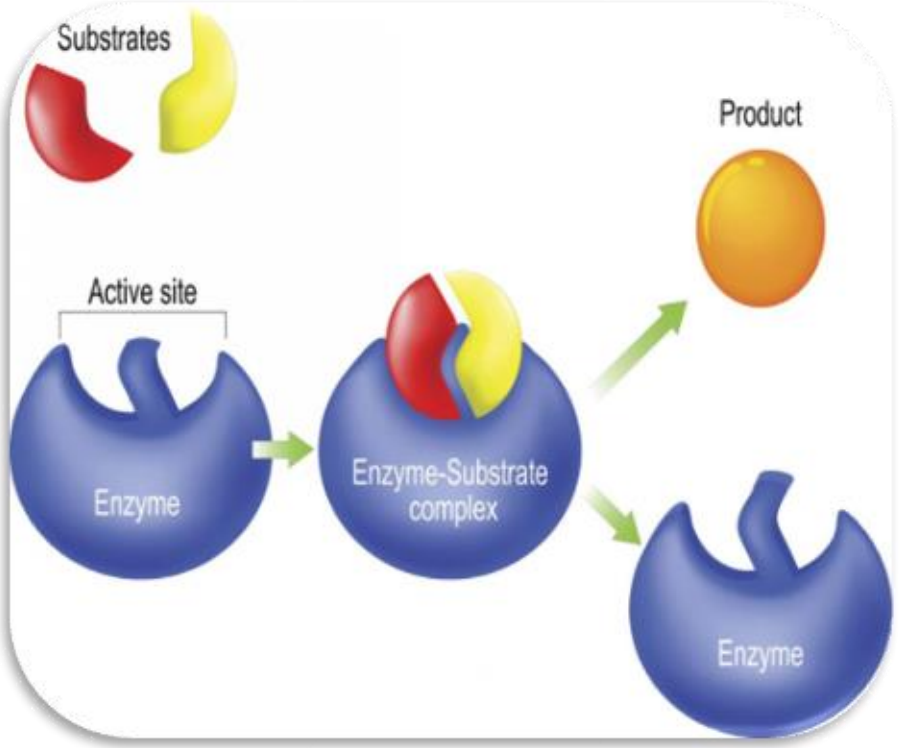
🗣 Respect the teacher and your classmates.

📵 Phones are not allowed during the class.

Enzymes

What are Enzymes and their function?

- **Enzymes** are molecules that catalyze (speed up chemical reactions) → *the biochemical reactions* that occur in cells.
- Chemically, enzymes are like any catalyst and are not consumed in chemical reactions.
- Not all enzymes are proteins, not all proteins are enzymes!



Important Terms

- **Catalysis:** the change in rate of a chemical reaction due to the participation of a substance called a catalyst = **Enzymes**.
- **Enzyme:** a biological molecule that increases the rates of chemical reactions (*mostly reversible*) without being consumed.
- **Substrate:** a molecule upon which an enzyme acts.
- **E-S complex:** an intermediate formed when the substrate molecule binds to the active site of the enzyme.
- **Active site:** is the region of an enzyme where substrate molecules bind and undergo a chemical reaction.
- **Product:** a substance produced as a result of the reactions.

$$E + S \rightleftharpoons ES \rightarrow P$$

enzyme plus the substrate — enzyme-substrate complex — product

Enzymatic reaction

There are 3 terms for an enzymatic reaction to happen:

1. Presence of the **enzyme**
2. Presence of **substrate**
3. Availability of **appropriate conditions** (37°C, pH 6.7)

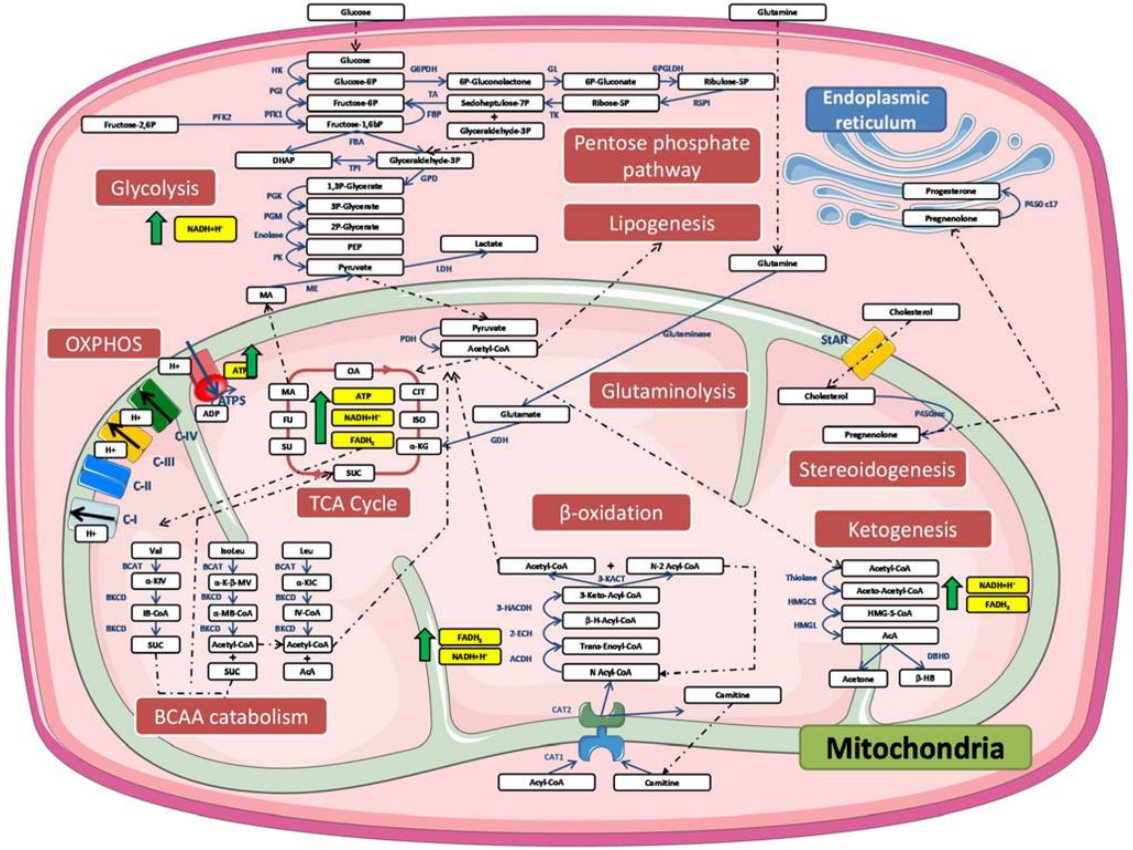
If any of these terms are absent, there will be no enzymatic reaction.

Give some examples of enzymes in the body.

Studying Enzymes

- Because hundreds of reactions are carried out simultaneously in the living cell, it becomes difficult to study a single reaction in an intact living cell.

- However, it is possible to **extract enzymes** from cells and thus study enzyme-catalyzed reactions in a test tube.



Notes in practical work

- In any experiment, you should know the aim and what you are doing while working.
- You must know why and what are the importance of the chemicals that you are adding during the experiment.
- You should be accurate.