BIO-ORGANIC CHEMISTRY
(Organic Chemistry for Biology Students)
(SQBS 1603)

Introduction

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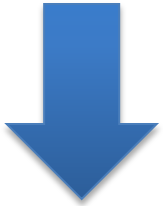
What is:

BIO-ORGANIC CHEMISTRY ?

BIOLOGY + ORGANIC CHEMISTRY



ORGANIC + CHEMISTRY

What is:

ORGANIC ?

"Derived from living organisms"

"organic compounds contain one or more carbon atoms"

ORGANIC CHEMISTRY?

"Chemistry of living organisms"

"Chemistry of carbon compounds"

Example of Organic Compounds:

Proteins in our skin

Lipids in our cell membranes

Sugar in our foods

Glycogen in our livers

DNA in our nuclei

Quaternary ammonium compounds in detergent

Polyaromatic hydrocarbon from oil or coal deposits

Urea from ammonium cyanate

What is:

- Biology ? Or Bio- ?
  - Natural science about living organisms

- Biological compounds
  - Proteins
  - Carbohydrates
  - Lipids
  - DNA
  - etc

BIO-ORGANIC CHEMISTRY

- **Chemistry** of carbon compounds derived from biological compounds.
- **Chemistry** of organic compounds in biological compounds.
- **Organic chemistry** of biological compounds.

BIO-ORGANIC CHEMISTRY

- Knowledge or information from **organic chemistry** in order to understand the biological compounds including their structure, synthesis, biochemistry, analysis etc.

I am biologist or biotechnologist !!!!

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Why bother with chemistry?

Why I need to learn organic chemistry?

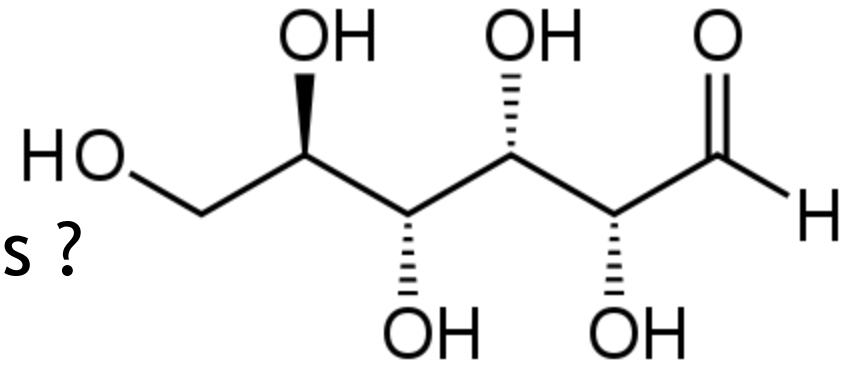
What is the importance of chemistry or organic chemistry for biologist?

Example of real future situation

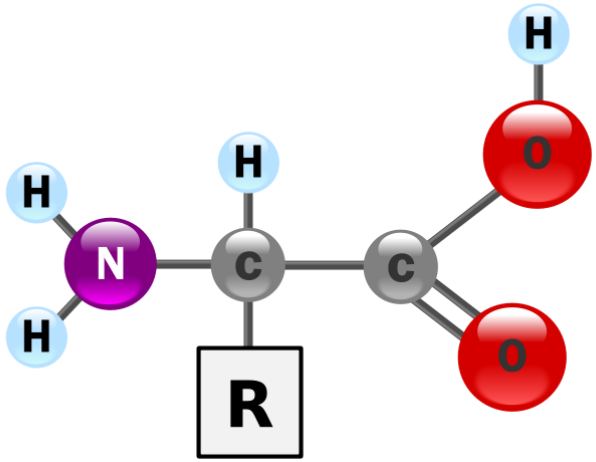
- In the near future (next semester or year)
  - You will learn subject called “Cellular Biochemistry and Metabolism”.
  - The synopsis of this subject

“This course focuses on theory and practical in basic biochemistry. Practical are arranged in separate sessions to give students enough time to develop their skills in biochemical analysis. Discussion on properties of water as medium for most of the biochemical reactions. An introduction to metabolism, glucose catabolism, glycogen catabolism and synthesis and gluconeogenesis, citric acid cycle, oxidative phosphorylation and electron transport chain. Important aspects of lipid breakdown and synthesis, protein metabolism, amino acid and nucleotide synthesis are also covered in detail.”

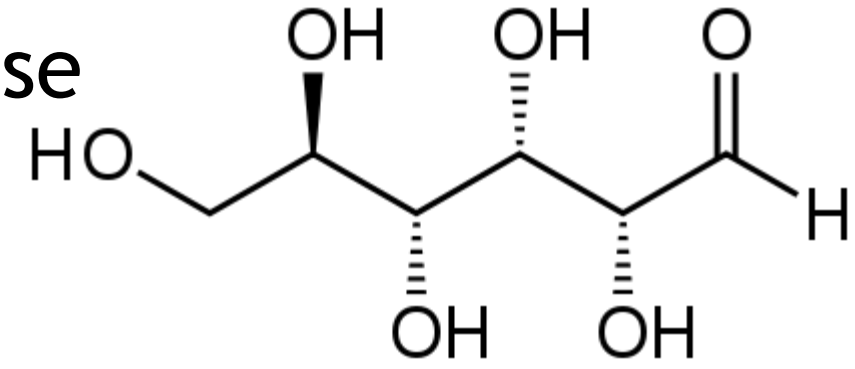
- Main Issues in “Cellular Biochemistry and Metabolism”.
  - Biochemistry ?
  - Biochemical analysis ?
  - Glucose ?



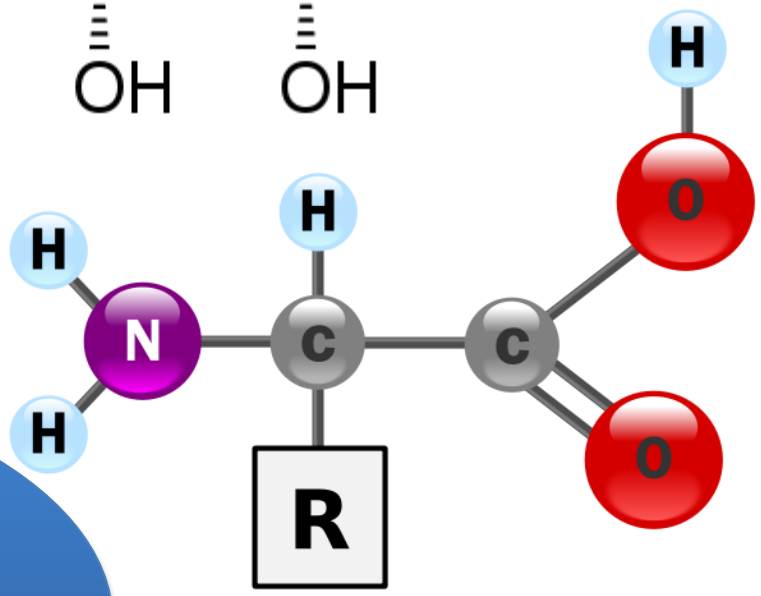
  - amino acid ?



- Glucose



amino acid



ORGANIC CHEMISTRY

Example of real future situation

- You are working as research officer at Johor Biotechnology.
- Your superior ask you to analyze samples from plant such as “pegaga (Centella asiatica)”.

•What if you do not know nothing about organic chemistry or about the analysis of organic compounds using instrumental techniques?

•Solution: Steps to analyze the major constituents in plants:

- •Extract the major components using reflux methods
- •Analyze the samples with instruments such as UV-Vis spectroscopy, Infrared spectroscopy or NMR spectroscopy.

CONCLUSION

- Students need to understand clearly the organic chemistry.
- Students need to really understand the organic chemistry before learning other biology or biotechnology subjects.

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MY PROFILE

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