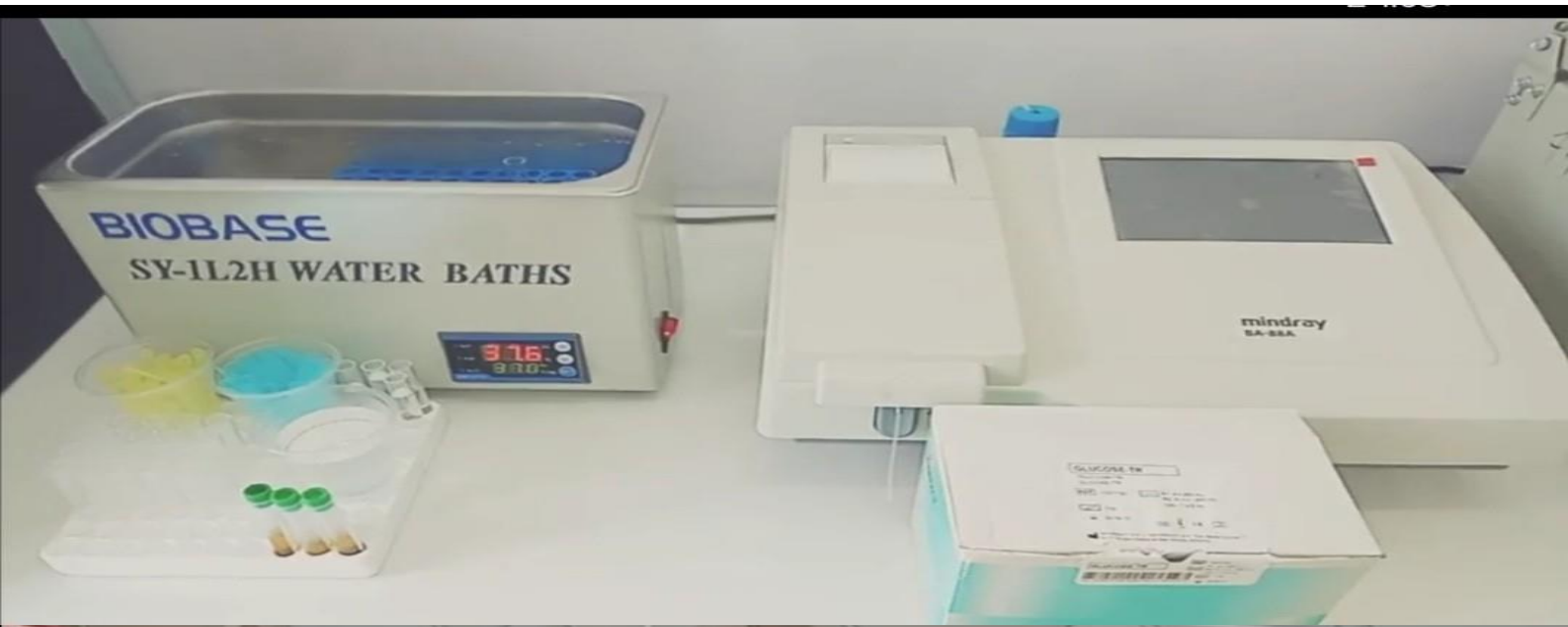


كلية المستقبل الجامعة

قسم هندسة تقنيات
الأجهزة الطبية



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Sugar analysis	عنوان المحاضرة



Factors maintaining blood glucose

Glycogenolysis
(Liver glycogen)

Source during early fasting (12-18hrs)

Diet
after digestion and absorption

mostly

Gluconeogenesis
(mainly from AAs)

Main source during prolonged starvation (>18 hrs)

Blood Glucose
70-110mg/dl

Use

Oxidation

Storage

glycogenesis

Conversion

Lipogenesis

Click to add text

Metabolic processes of Glucose

1- Glycolysis : Conversion of glucose to lactate or pyruvate

Type of Glycolysis:

a- aerobic glycolysis

Glucose ----- \rightarrow pyruvate ----- \rightarrow acetyl co A (highly Oxygen)

b- anaerobic glycolysis

Glucose ----- \rightarrow Lactate ----- \rightarrow Ketone bodies (hypoxia)

2- Glycogenesis: The process refers to conversion of glucose to glycogen.

3- Glycogenolysis: The process refers to breakdown of glycogen to glucose and other intermediate products.

4- Gluconeogenesis: The formation of glucose from non-carbohydrate such as amino acids and fatty acid.

Hormones Involved in Regulation of blood glucose



- > GLUCAGON
- > INSULIN
- > SOMATOSTATIN



- > Adrenal medulla
Epinephrine
- > Adrenal cortex
Cortisol



ACTH
Growth Hormone



> **THYROXINE**

Regulation of blood glucose levels :-

Many hormones were responsible for regulation of blood glucose which they are:

1- **Insulin**: produced by β -cells in pancreas blood glucose by insulin (Glycogenesis & lipogenesis) \rightarrow formation far from CHO

2- **Glucagon**: (Blood glucose) secreted by α - Cells of pancreas which stimulate glycogenolysis.

3- **Hydrocortisone**: (blood glucose) secreted by adrenal cortex, this hormone stimulate Gluconeogenesis.

Regulation of blood glucose levels :-

4- Epinephrine: (Blood glucose) secreted by adrenal gland which stimulate glycogenolysis.

5-Growth hormone and Adreno Cortico Trophic Hormone (ACTH): (secreted by anterior pituitary glands) so those hormones blood glucose.

6- Thyroxine: (Blood glucose) secreted from thyroid gland which stimulate glycogenolysis.

Clinical Significance

Hypoglycemia:

Hypoglycemia is a blood glucose concentration below the fasting value

Hyperglycemia

It is increased glucose concentration in the blood. The most important diseases related to the increase in blood glucose conc.

Is Diabetes mellitus (is actually a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both).