

# Lab 5 – Hepatic Portal System, ABO & Rh Blood groups, Blood Glucose

Describe/Define and state the function(s) of the **hepatic portal system**.

## OYO - LIVER FUNCTIONS

1. **Production of BILE** to: (1) dilute & neutralize the acidic stomach acids in the small intestine  
(2) Emulsify (break up) fats in the small intestine for digestion
2. **Storage of vitamins** (A, D, E, K & B12) and the **minerals** (copper and iron) and **glycogen**. The glycogen stored in the liver is the only glycogen that can be broken down and returned to the blood as glucose. Glycogen stored in muscle cells can be broken down and used but only by those muscle cells.
3. **Controls (partially) the levels of triglycerides and lipoproteins (VLDL, LDL & HDL) circulating in the blood.**
4. **Interconversion of nutrients.** (1) Excessed of some nutrients can be converted into other nutrients (which might be lacking) or (2) some nutrients are converted into forms that are most easily used by the body.
5. **Detoxification of metabolic wastes and harmful substances absorbed with food.** These substances are altered into a less toxic form. Once detoxified are then eliminated into bile or urine.
6. **Phagocytosis of RBCs, WBCs, bacteria, cellular debris, etc.** The phagocytic cells of the liver are called **Kupffer cells**.
7. **Synthesis of plasma proteins** such as clotting factors, fibrinogen, prothrombin, and other plasma proteins that contribute to the osmotic pressure of the blood.

**Hepatitis** (inflammation of the liver) can result from alcohol consumption or viral infections of types A, B or C. Damaged hepatocytes are capable of regenerating but the surrounding connective tissues grow even faster and my ultimately replace or crowd out functional hepatocytes with non-functional scar tissue (**fibrosis**).

As a result, the liver has impaired function and takes on a whitish color and becomes rigid = **cirrhosis**.



# **ABO BLOOD GROUPS (practice quiz)**

What determines whether a person has blood type A, B, AB or O?

What is the “magic” question to ask when deciding which blood type can give to which blood type?

Can type A safely give blood to type B? Why or why not?

Can type A safely give blood to type AB? Why or why not?

Can type AB safely give to type O? Why or why not?

Can type O safely give to type A? Why or why not?

Which blood type is the “universal recipient”? They can receive from anybody. But why?

Which blood type is the “universal donor”? They can give to anybody. But why?

## **RH BLOOD GROUPS**

If the mother is  $RH^+$  and the fetus is  $RH^-$  is there a likelihood of erythroblastosis fetalis (HDN)?

If the mother is  $RH^-$  and the fetus is  $RH^+$  is there a likelihood of erythroblastosis fetalis (HDN)?

If the mother is  $RH^+$  and the fetus is  $RH^+$  is there a likelihood of erythroblastosis fetalis (HDN)?

# BLOOD GLUCOSE

Under the supervision of your instructor use a glucometer to measure your own blood glucose level. Post your # on the white board under the appropriate column.

What are **NORMAL (fasting) VALUES** for glucose and what normally happens to blood glucose values following a meal?

**Why** is adequate blood glucose important?

Which organ relies almost exclusively on glucose and is therefore the most sensitive to low levels?

Explain the **homeostasis** of blood glucose levels by **pancreatic hormones**. OYO

Distinguish b/t **HYPERGLYCEMIA** and **HYPOGLYCEMIA**. What are the criteria for each?

After everyone has posted their glucose #s on the board examine the #s.

What is the unit of measure? \_\_\_\_\_

Are there any that meet the criteria for hyper- or hypoglycemia? Why or why not?

