

Sept 2011
QUESTION 09

Define a Portal System. Describe the anatomy and function of three portal systems in the body.

Portal system

an arrangement by which blood collected from one set of capillaries passes through a large vessel or vessels, to another set of capillaries before returning to the systemic circulation.

Three portal systems

Hypothalamus and anterior pituitary

system of blood vessels that link the hypothalamus and the anterior pituitary in the brain, which allows endocrine communication between the two structures

Liver

venous blood from the GI tract drains into the superior and inferior mesenteric veins these two vessels are then joined by the splenic vein to form the portal vein enters the liver, drains into the hepatic sinusoids, hepatic veins which join the IVC has immunological functions as a filter and for antigen removal and presentation metabolically to utilise the absorbed nutrients from the gut

Renal

afferent arterioles enters the glomerulus (first capillary network), efferent arterioles, then the peritubular network(second capillary network) eventually the venous system increases filtration at the glomerulus via increased net filtration pressure ($P_{cap} - P_{bowmans}$) maintains the concentration gradient