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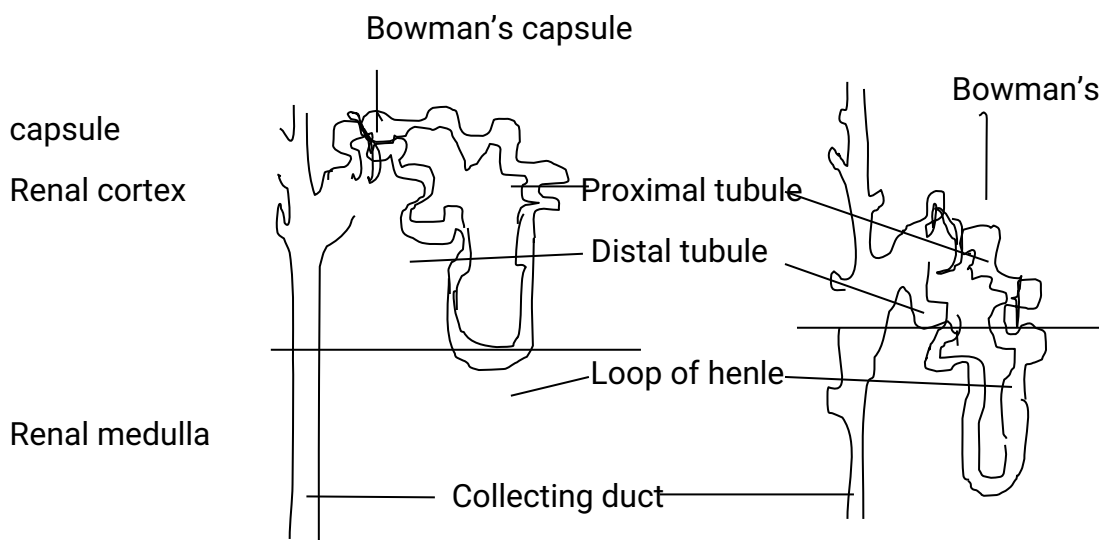
PHYSIOLOGY

ORGANOLOGY

ANA 204

1. Using the desert mammal, camel, as an example. The nephrons in the desert mammal camel are equipped with well developed henle's loop and number of juxtamedullary nephrons in kidneys is very high. It's about 35%.in man, it's about 15%.

Desert mammals do not readily find water; hence they are able to produce highly concentrated urine



From the diagram above, it is seen that the henle's loop of juxtamedullary (adjacent to medulla of kidney) nephron goes deep down into the medulla. This why medulla of camel's kidney is thicker than that of other mammals, but it is most well developed in another desert mammal, the kangaroo rats.

The Henle's loop of juxtamedullary nephrons along with counter flowing blood vessels, called vasa recta, help to conserve water.

Blood first flows along ascending limb of Henle, which is impermeable to water. Solute can leave the filtrate and enter the blood along this stretch. When this blood flows along descending limb, water is reabsorbed from filtrate but not the solutes.

The longer the loop of Henle, the more amount of solute will be reabsorbed

and hence more amount of water could be removed from filtrate.

2. Importance of Glomerular filtration barrier

The glomerular filtration barrier has several layers. The first is a glycocalyx made up of proteoglycans and an adsorbed layer of plasma proteins that is located between the endothelial cells form the next layer. Next is the thick glomerular basement membrane (GBM), which is synthesized by podocytes and endothelial cells and has an inner layer composed of collagen type IV and laminin sandwiched between layers of heparin sulphate. The glomerular filtration barrier functions as a highly organized, semipermeable membrane preventing the majority of proteins into the urine.