Renal Corpuscle

The renal corpuscle, located in the cortex, is the first site of filtration in the nephron. Here, arterioles bring blood from the body into the kidney for filtration. The glomerulus is a cluster of capillaries derived from those arterioles that feed into the nephron. Some important parts of the glomerulus include fenestrations, basement membrane, and podocytes. Through selective filtration, the glomerulus filters the blood and allows plasma solutes and large proteins to be secreted as ultrafiltrate. However, red blood cells cannot be filtered and are maintained in the blood. Smaller molecules enter the nephron to be reabsorbed or secreted, depending on physiological conditions. Encapsulating the glomerulus is Bowman's capsule, which is the location of ultrafiltration. From here, filtrate enters the nephron.

PLAY PICMONIC

LOCATION

Cortex
Kidney Cortez
The cortex is the outer layer of the kidney where renal corpuscles, including the glomerulus and Bowman’s capsule, are located.

Characteristics

Arterioles
Artery-O's
Afferent arterioles bring blood from the renal artery into the glomerulus of the kidney, where filtration begins, these afferent arterioles are able to dilate to allow for more filtration.

Glomerulus
Glow-mare
The glomerulus is a cluster of capillaries receiving blood from the afferent arterioles, and it performs the first stage of filtration. It consists of capillary walls with fenestrations, which are small pores allowing passage of water, electrolytes, and small molecules while restricting larger proteins and cells. Other important parts of the glomerulus are the basement membrane and podocytes. They regulate filtration further. Podocytes are cells with foot-like extensions that form slit diaphragms, creating a selective barrier for filtering waste products, water, and other small molecules from the blood.

Capillaries
Caterpillar
The glomerulus is a cluster of capillaries leading to the nephron. It is the first site of filtration in the kidney.

Selective Filtration
Selective Filter
Selective filtration is the process in which the glomerulus filters blood. The filtration is based on size and charge. It allows small molecules like water, ions, glucose, and urea to pass into Bowman’s capsule, while larger molecules like proteins and blood cells are retained in the bloodstream. The filtration is a critical step in forming urine and regulating body fluids.

Plasma Solutes and Other Small Molecules Become Ultrafiltrate
Plasma-TV, Glucose-glue, A-mean-ol'-lemon and ions secreted into Ultra-filtrate bucket
Glucose, amino acids, salts, and urea are pushed by high pressure into the filtrate that enters the nephron. This process is called ultrafiltration.

Bowman's Capsule Encapsulates Glomerulus
Bow-man Encapsulating Glow-mare
Bowman's capsule is the site where the filtrate from ultrafiltration first collects. It surrounds the glomerulus, capturing the filtrate that passes through the glomerular filtration barrier. This marks the border between blood in the capillaries and filtrate entering the nephron.