Editorial

iMedPub Journals
www.imedpub.com

Journal of Anatomical Sciences and Research

2021
Vol.4 No.6:e001

Nephron: Vital Structure of the Kidney

Feins Nova*

Department of Anatomy, University of the Andes, Bogotá, Colombia

***Corresponding author:** Feins Nova, Department of Anatomy, University of the Andes, Bogotá, Colombia, E-mail: feinnv@gmail.com

Received date: November 26, 2021**; Accepted date:** December 10, 2021**; Published date:** December 17, 2021

Citation: Nova F (2021) Nephron: Vital Structure of the Kidney. J Anat Sci Res Vol.4 No.6:e001.

Description

The nephron is the kidney's smallest and most functional structural and functional unit. The nephrons work through a two-step process: the glomerulus sieves your blood, and the tubule returns needed substances to your blood and eliminates wastes. A renal corpuscle and a renal tubule compose this structure. A tuft of capillaries called a glomerulus and a cup-shaped structure called Bowman's capsule make up the renal corpuscle. From the capsule, the renal tubule extends. The capsule and tubule are joined by a lumen and are made up of epithelial cells. Each kidney in a healthy adult has 1 to 1.5 million nephrons. Blood is filtered as it flows through three layers: the capillary wall's endothelial cells, the basement membrane, and the foot processes of the podocytes in the capsule lining. Between the descending and ascending parts of the tubule are peritubular capillaries.

The collecting duct and the distal tubule, which contains the thick ascending limb (TAL), the macula densa, and the distal convoluted tubule (DCT), are physically varied, mirroring the functional heterogeneity. The surface area of the apical plasma membrane grows as the TAL ascends from the medulla to the cortex, while the surface area of the basolateral membrane decreases. The DCT has a structure similar to the medullary TAL. In the distal tubule, structure, Na-K-ATPase activity, and NaCl reabsorptive capacity are all highly correlated. The initial collecting tubule (ICT), cortical (CCD), outer medullary (OMCD), and inner medullary (IMCD) collecting ducts make up the collecting duct. A transition zone known as the connecting segment exists between the distal tubule and the collecting duct. Within the two primary cell groups, intercalated cells and principal cells, there is significant structural variability along the collecting duct. Potassium loading and mineralocorticoids promote Na-K-ATPase activity and cause proliferation of the basolateral membrane of CNT cells and main cells in the CNT, ICT, and CCD, identifying the cells that secrete potassium in response to mineralocorticoids. Finally, types A and B are two morphologically separate populations of intercalated cells. Type A predominates in the CNT and OMCD of the rat, and it is thought to be responsible for H+ secretion, at least in the OMCD. In the CCD, Type B predominates, and it may be implicated in bicarbonate secretion.

Recent research of mammalian nephron segments has revealed the wide range of renal transport functions. Most chemicals are delivered by many segments, each with its own set of transport processes. Spatial separation of transport processes allows for independent and efficient management of the excretion of chemicals with interdependent renal processing. The organisation of sodium and water management along the nephron is meticulously studied. Many other compounds are excreted by the kidneys, and sodium and water play a key role in this process. Sodium and water excretion rates, on the other hand, are controlled separately. The kidney's complex architectural structure not only separates transport processes along the nephron, but also connects the functions of distinct segments by juxtaposing them in specialised locations within the medulla and cortex. These anatomical configurations serve as a framework for integrating the diverse range of renal functions.