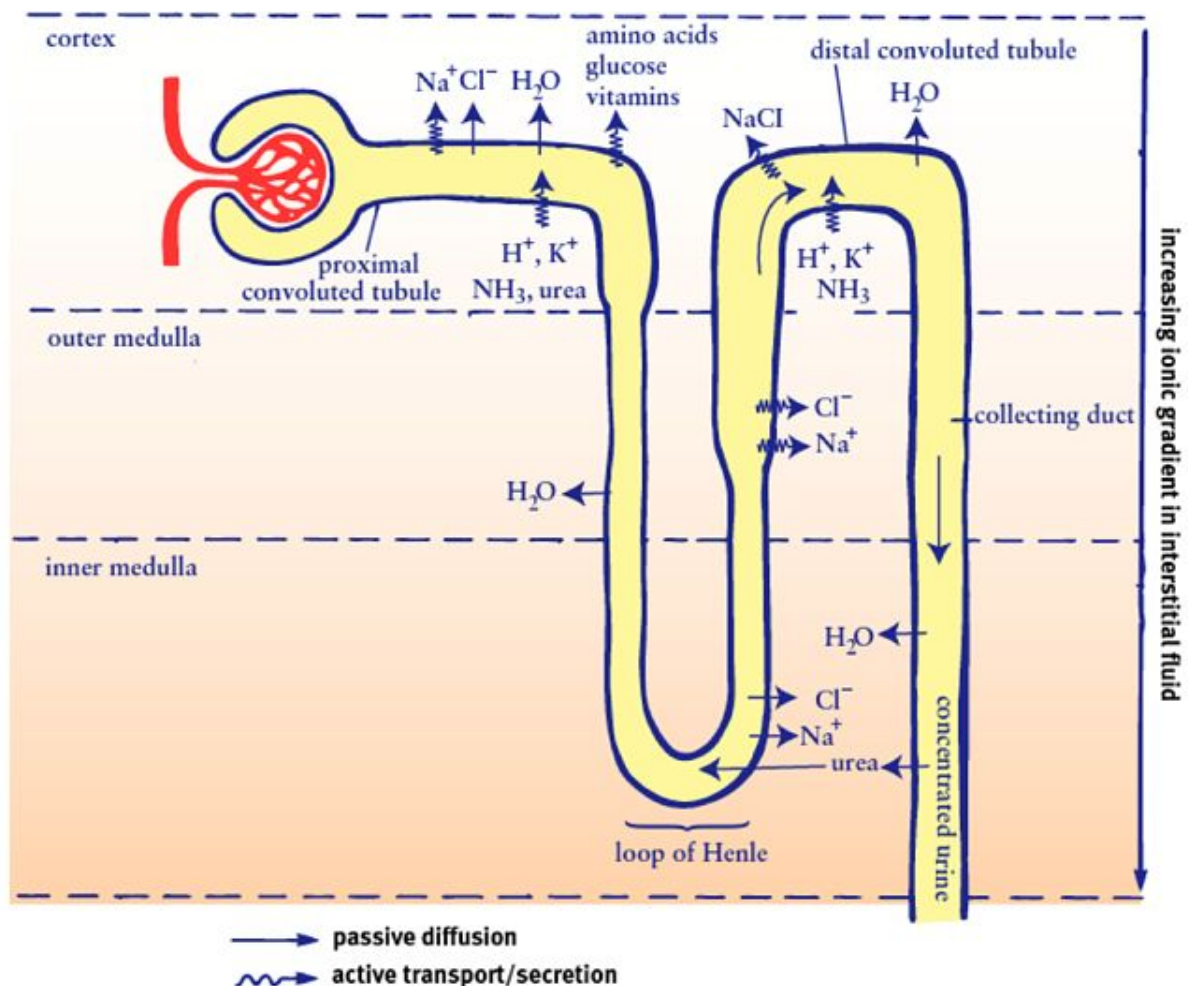


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### Functional unit of kidney-P-2

The Loop of Henle the PCT leaves the renal cortex and turns into the thin descending limb (TDL) of the loop of Henle penetrating the renal medulla. The tubule becomes narrower, and the cells become smaller, with few mitochondria and short microvilli often unnoticeable on light microscopy. The tubule then makes a turn upward towards the cortex, turning into the thick ascending limb (TAL). Here the lining cells become larger with more numerous microvilli and mitochondria to engage in the active transport of sodium to dilute the urine.



The Juxtaglomerular Apparatus and the Distal Convolved Tubule the juxtaglomerular apparatus is the region in charge of the regulation of the glomerular filtration through the tubuloglomerular feedback. Histologically, this region is near the vascular pole of the glomerulus.

It is made up of the macula densa cells of the cortical TAL and the granular smooth muscle cells of the afferent arteriole of the glomerulus, functionally and structurally connected by glomerular mesangial cells. The macula densa cells are morphologically distinct tubule cells characterized by a dense region of tall cells. The TAL turns into the DCT after returning to the renal cortex near its glomerulus of origin. The DCT comprises the nephron segment between the macula densa and the cortical collecting tubule (CCT). The DCT cells are tall cells notable for containing the largest number of mitochondria among other cells in the nephron. They have an extensive basolateral amplification enclosing multiple mitochondria, creating a palisading appearance in the basal part of the cells. Intercalated cells begin to appear in the latter segment of the DCT and remain throughout the connecting and collecting tubules. Connecting and collecting tubules the final part of the nephron is the connecting tubules, where the last fine-tuning of the urine occurs.

These tubules have two types of cells; the intercalated cells and the connecting tubule (CNT) cells. The intercalated cells appear dense on electron microscopy and do not have the basolateral amplification characteristic of the DCT cells. These cells regulate hydrogen and bicarbonate secretion. The connecting tubule cells also have basolateral amplification, but they possess fewer mitochondria than DCT cells. The appearance of principal cells marks the transition into the collecting tubules and the end of the nephron. In cortical nephrons, the CNT leads to the collecting tubule, which drains to a collecting duct. The connecting tubules of juxtamedullary nephrons join and form an arcade that drains into a shared collecting duct.