

Channel	Location	How it works	Blocker	Stimuli
Na⁺/K⁺ ATPase key transporter element in PCT	PCT Basolateral membrane	extensive transport of Na ⁺ which cause a change in the osmolality (the osmolality in the tubular fluid < osmolality in the interstitial fluid) and this will make water move toward the blood capillaries.		
Na⁺-glucose Symporters (secondary active transport) / co-transportation	PCT	benefit from the gradient created by the Na ⁺ /K ⁺ ATPase -that uses the ATP- to allow sodium to pass from the tubular fluid into the inside of the cell and simultaneously transporting glucose with the sodium ions through the symporter against its gradient). Then the glucose is transported from the high gradient area (inside the cell) into the low gradient one (outside the epithelial cell) through the facilitated diffusion using a certain carrier.		
Na⁺/H⁺ counter-transporter	PCT	sodium ions will be transported into the inside, hydrogen ions into the outside. Na ⁺ /H ⁺ counter-transporter benefits the sodium ions gradient to excrete the hydrogen ions into the urine to eliminate acids.		
(Na-K-Cl) channel	Thick ascending limb of Henle	Transports Na ⁺ & 2Cl ⁻ & K ⁺ from the luminal or tubular fluid into the tubular cells	Loop diuretics Ex. Furosemide (Lasix)	
Na⁺/H⁺ exchange channel	Thick ascending limb of Henle	reabsorbs Na ⁺ by using the gradient that is produced by the Na ⁺ /K ⁺ -ATPase, so it can secrete the H ⁺		
Na⁺/K⁺ ATPase	Thick ascending limb of Henle Basolateral side	NaCl reabsorption		
Na⁺/Cl⁻ channel	Early distal tubule	transports Na ⁺ /Cl ⁻ by using the Na ⁺ gradient (Na ⁺ & Cl ⁻ reabsorption)	Thiazide	
epithelial sodium potassium channel (ENaC)	In principle cells in late distal tubule & collecting duct	it reabsorbs sodium and secretes potassium	-Amiloride diuretic Cause diuresis without decreasing k ⁺ conc in blood. potassium-sparing diuretic (blocks the secretion of k ⁺) -Aldosterone antagonist ex. Spironolactone	-Aldosterone Used in hyperkalemia -ADH
Hydrogen ATPase	Intercalated cells in late distal tubule & collecting duct	Secrete H ⁺ & reabsorb HCO ₃ ⁻ to prevent acidosis In alkalosis it works the opposite. More effective than Na ⁺ /H ⁺ exchanger in TAL		Aldosterone