Nephrons

How Blood is Filtered

Nephrons are the functional units of the kidney. Nephrons are composed of a Bowman's capsule, a series of ducts and closely associated blood vessels. Nephrons working under hormonal control precisely regulate the osmotic concentration of blood and thus all body fluids. Nephrons in the kidney along with the collecting ducts produce hypertonic urine, this helps mammals conserve water and remove nitrogenous wastes(urea) from the body. Antidiuretic hormone(ADH) promotes the reabsorbtion of water. Cells in the brain called osmoreceptor cells monitor blood osmotic concentration. These cells stimulate production of ADH and stimulate thirst.

Production of Urine in the Nephron and Kidney

Urine is the product of four processes, listed and described below.

Process	Where it Occurs	What Happens
Filtration	In the Bowman's capsule	Water and other small molecules, such as salts, urea, glucose, amino acids, are filtered from the blood and enter the Bowman's capsule
Reabsorbtion	Descending and ascending loops of Henle and in distal tubules	Water, salts, amino acids, glucose are returned to the kidney and ultimately to the blood. These are all substance s that the body can use.
Secretion	Distal tubules	K^+, H^+, some drugs and toxins are removed from the blood.
Excretion	Collecting ducts, renal pelvis, ureter, bladder and urethra.	Urine is removed from the body.

Important items.

- Water always moves by osmosis.
- Salt(as Na^+ and Cl^- ions) moves by active transport.
- Desert adapted mammals have long loops of Henle for reabsorbing water. These animals excrete little or no urine. Some desert mammals produce urine that has 20 times the osmotic concentration of blood.

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