

Homeostasis, hormones and the kidney

Define negative feedback.

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Define positive feedback.

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Why does negative feedback keep a factor within narrow limits?

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Define homeostasis.

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Role of the hypothalamus in thermoregulation?

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How does vasodilation reduce body temperature?

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What is a transcription factor?

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Why can steroid hormones enter cells but peptide hormones cannot?

The response increases the change away from the starting point, e.g. oxytocin in labour.

A change in a factor is detected and the response reverses it, returning the factor to its set point.

Maintenance of a stable internal environment within narrow limits, a state of dynamic equilibrium.

Any change in either direction is detected and corrected by effectors that act in opposite ways.

More blood flows through skin capillaries near the surface, so more heat is lost by radiation.

Its thermoreceptors detect blood temperature, and it coordinates responses by effectors.

Steroids are lipid-soluble and diffuse through the phospholipid bilayer; peptides are water-soluble.

A protein that binds to a specific DNA sequence and switches transcription of a gene on or off.

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Which parts of the nephron are in the cortex?

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Why is the afferent arteriole wider than the efferent arteriole?

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What is deamination?

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Name the three layers filtrate crosses in ultrafiltration.

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What is in glomerular filtrate?

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How is glucose reabsorbed in the proximal tubule?

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What is the role of the ascending limb of the loop of Henle?

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Why is the loop of Henle a countercurrent multiplier?

To create a high hydrostatic pressure in the glomerulus for ultrafiltration.

The glomerulus, Bowman's capsule, proximal convoluted tubule and distal convoluted tubule.

Capillary endothelium (with fenestrations), basement membrane and podocytes of the Bowman's capsule.

Removal of the amino group from an excess amino acid in the liver, forming ammonia (then urea) and a keto acid.

By sodium-glucose co-transport (using the sodium gradient set up by active transport), then facilitated diffusion into the blood.

Water, glucose, amino acids, urea and ions; no blood cells or large proteins.

Fluid flows in opposite directions in the two limbs, and a small gradient at each level is multiplied into a steep gradient.

It is impermeable to water and actively pumps Na^+ and Cl^- into the medulla, lowering its water potential.

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Where are osmoreceptors and where is ADH released?

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How does ADH increase water reabsorption?

It causes aquaporins to be inserted in the collecting duct membrane, so it is more permeable to water.

Osmoreceptors are in the hypothalamus; ADH is released from the posterior pituitary gland.