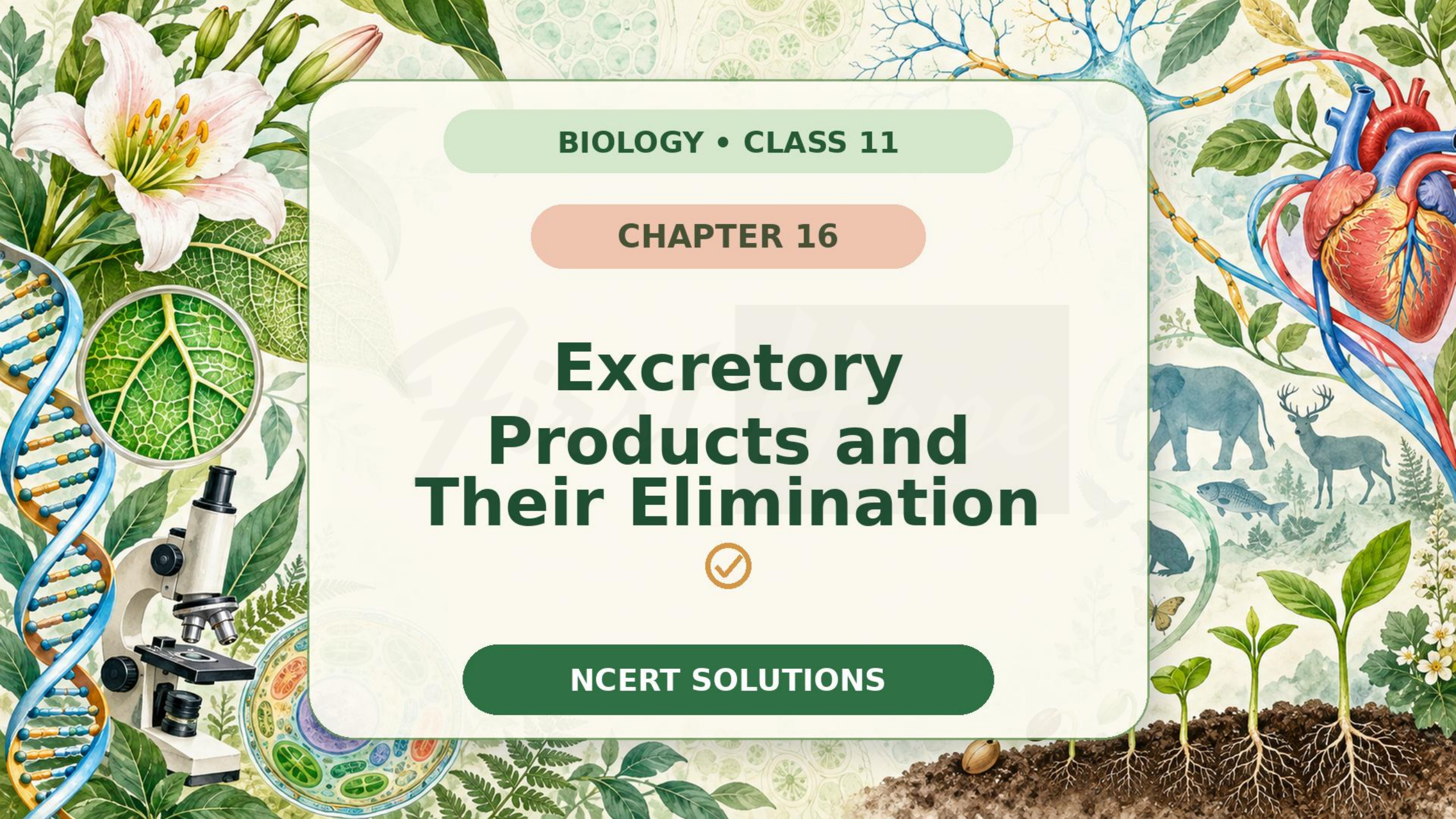


A vibrant, detailed collage of biological illustrations. On the left, a blue and orange DNA double helix is visible. Next to it is a magnifying glass focusing on a green leaf's vein structure. Below the magnifying glass is a microscope. In the bottom left corner, there's a detailed diagram of a cell with various organelles. The background is filled with various green leaves, a pink lily flower at the top left, and a blue and red heart with its major blood vessels on the right. At the bottom right, there's a small landscape with a deer, a fish, and some plants growing out of the soil.

BIOLOGY • CLASS 11

CHAPTER 16

Excretory Products and Their Elimination



NCERT SOLUTIONS

EXERCISE SOLUTIONS: QUESTIONS 1-2

1. Define Glomerular Filtration Rate (GFR).

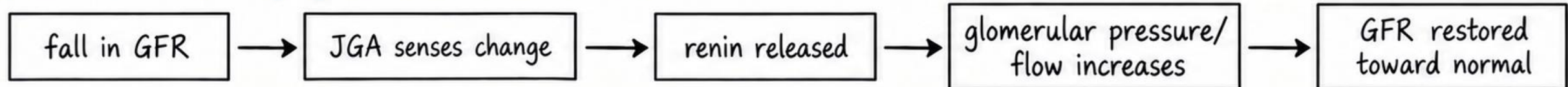
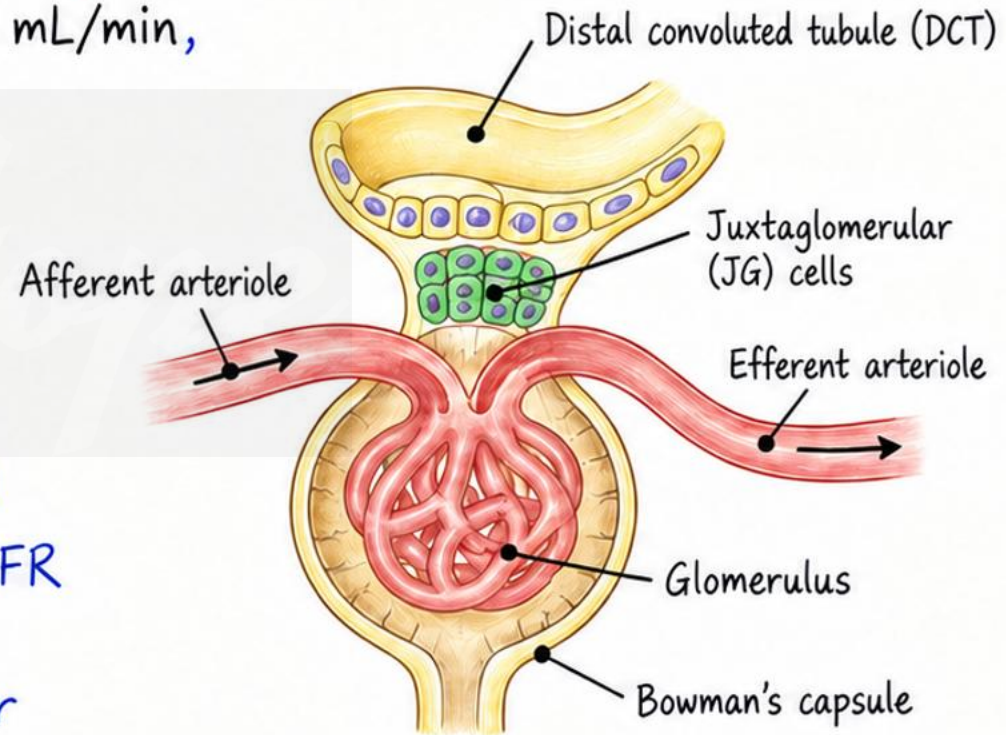
Answer:

Glomerular Filtration Rate is the quantity of filtrate formed by both kidneys per minute. In a healthy adult, GFR is about 125 mL/min, or about 180 L/day.

2. Explain the autoregulatory mechanism of GFR.

Answer:

The kidneys can regulate GFR through the juxtaglomerular apparatus (JGA), formed by specialised cells where the distal convoluted tubule touches the afferent arteriole. A fall in GFR activates juxtaglomerular cells to release renin. Through the renin-angiotensin mechanism, renal blood flow and glomerular pressure rise, bringing GFR toward normal.



EXERCISE SOLUTION: QUESTION 3

Indicate whether the following statements are true or false.

1. (a) Micturition is carried out by a reflex.

Answer: **TRUE** - The micturition reflex is initiated by stretch receptors in the urinary bladder.

2. (b) ADH helps in water elimination, making urine hypotonic.

Answer: **FALSE** - ADH increases water reabsorption, reduces water loss and makes urine more concentrated.

3. (c) Protein-free fluid is filtered from blood plasma into Bowman's capsule.

Answer: **TRUE** - The glomerular filtrate is virtually free of proteins.

4. (d) Henle's loop plays an important role in concentrating urine.

Answer: **TRUE**

5. (e) Glucose is actively reabsorbed in the proximal convoluted tubule.

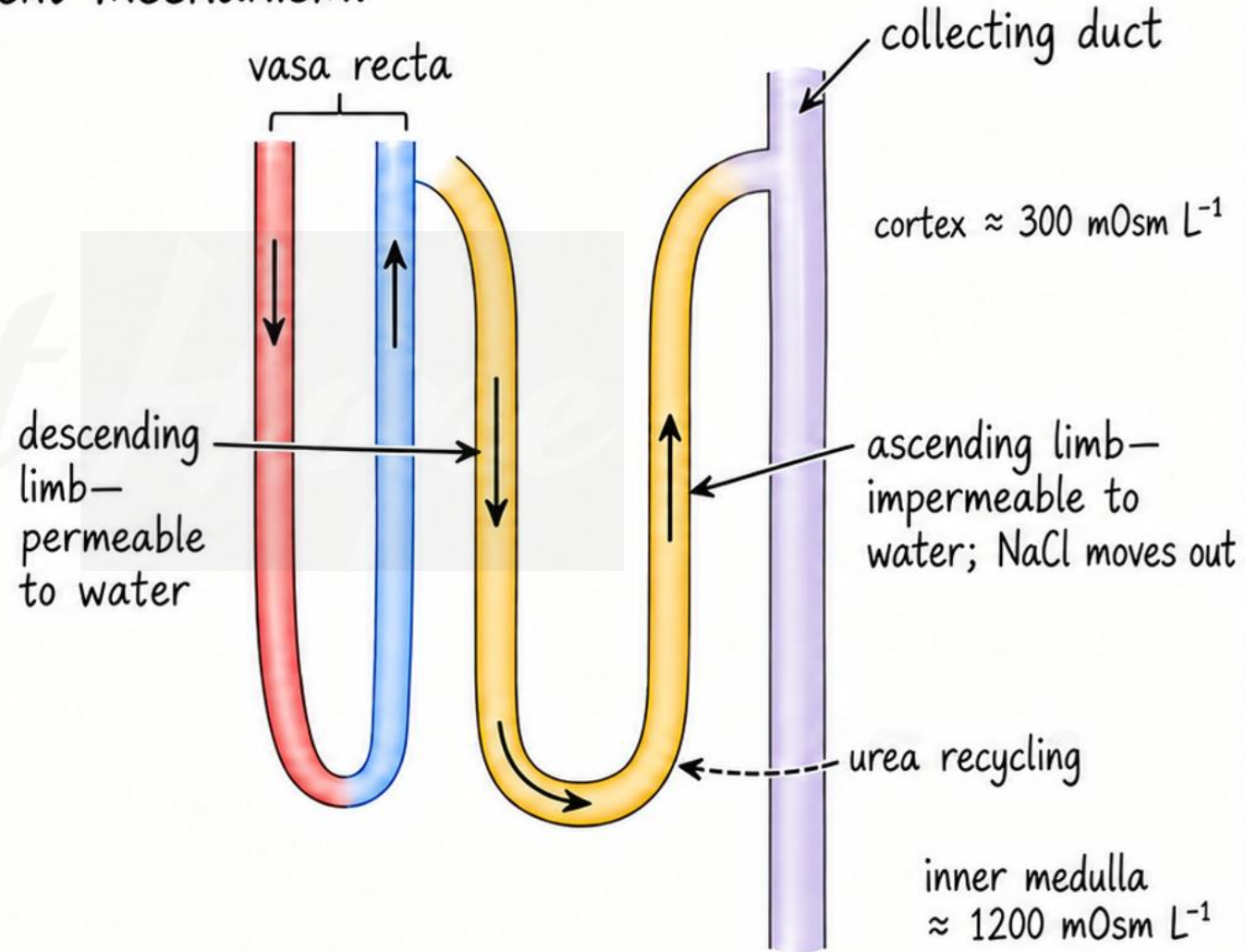
Answer: **TRUE**

EXERCISE SOLUTION: QUESTION 4

4. Give a brief account of the counter-current mechanism.

Answer:

Opposite flow in Henle's loop and vasa recta produces and preserves an increasing osmotic gradient in the medulla. NaCl and urea build this gradient. It allows water to leave the collecting duct, especially in the presence of ADH, so concentrated urine is formed.

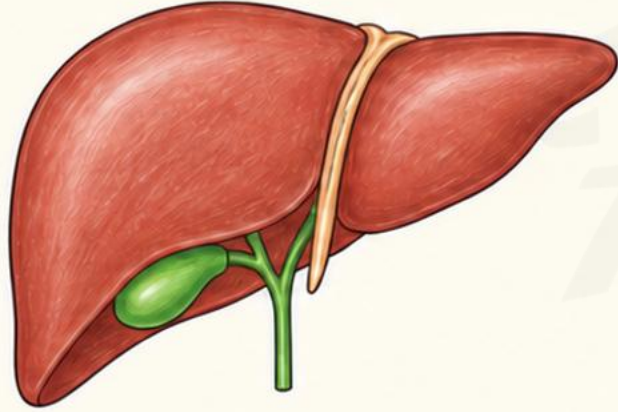


EXERCISE SOLUTION: QUESTION 5

5. Describe the role of liver, lungs and skin in excretion.

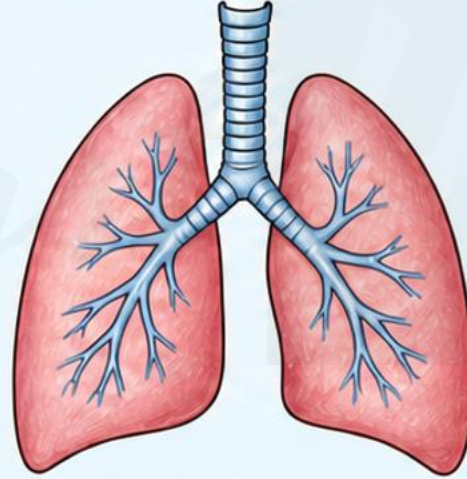
Answer:

Liver



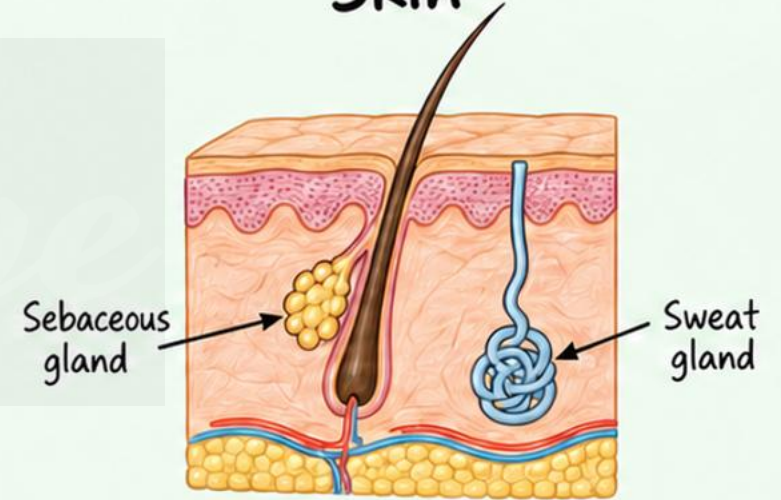
eliminates bilirubin, biliverdin, cholesterol, degraded steroid hormones, vitamins and many drugs through bile; these leave mainly with faeces.

Lungs



remove carbon dioxide (about 200 mL/min) and considerable water vapour.

Skin



sweat glands remove water, NaCl, small amounts of urea and lactic acid; sebaceous glands release sterols, hydrocarbons and waxes in sebum.



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