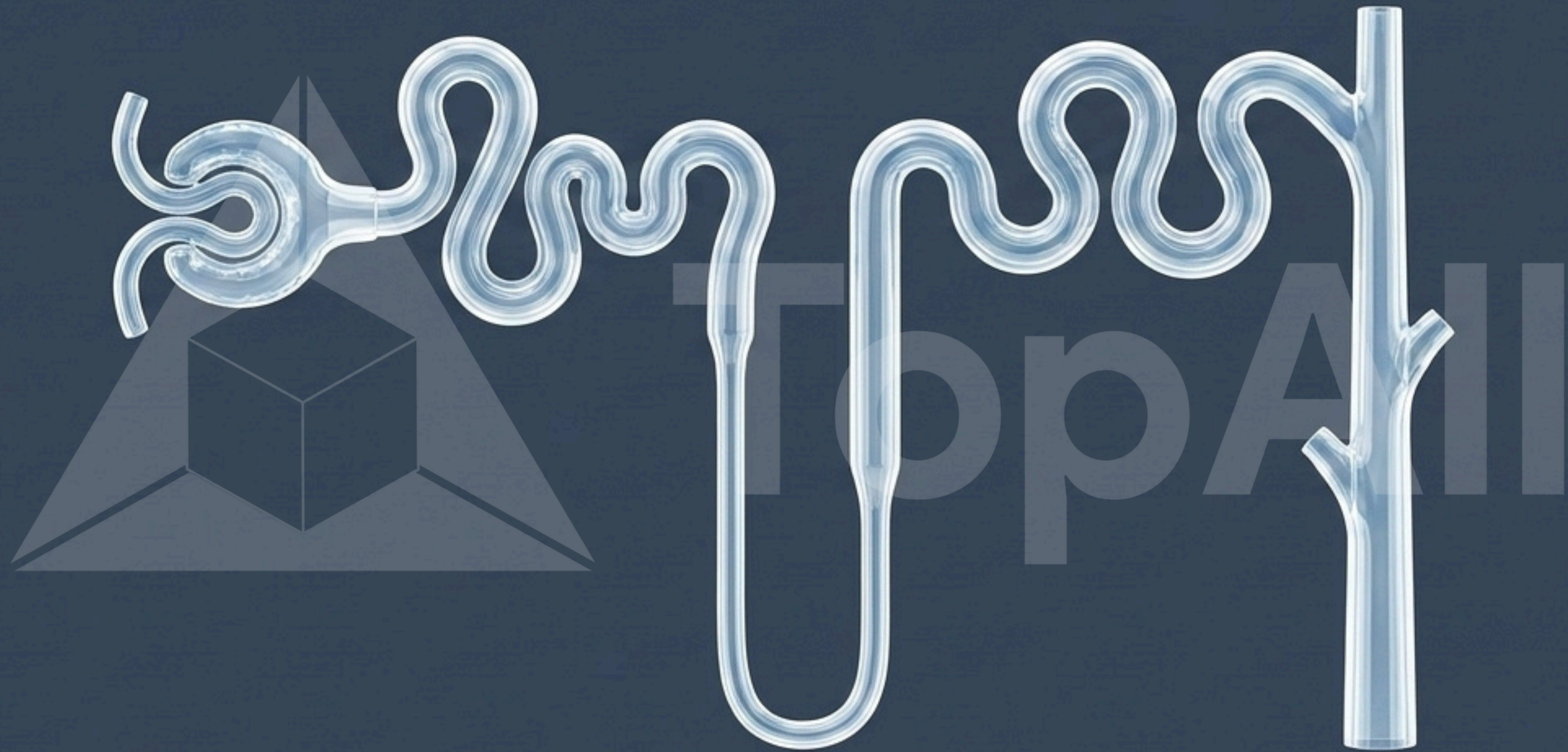


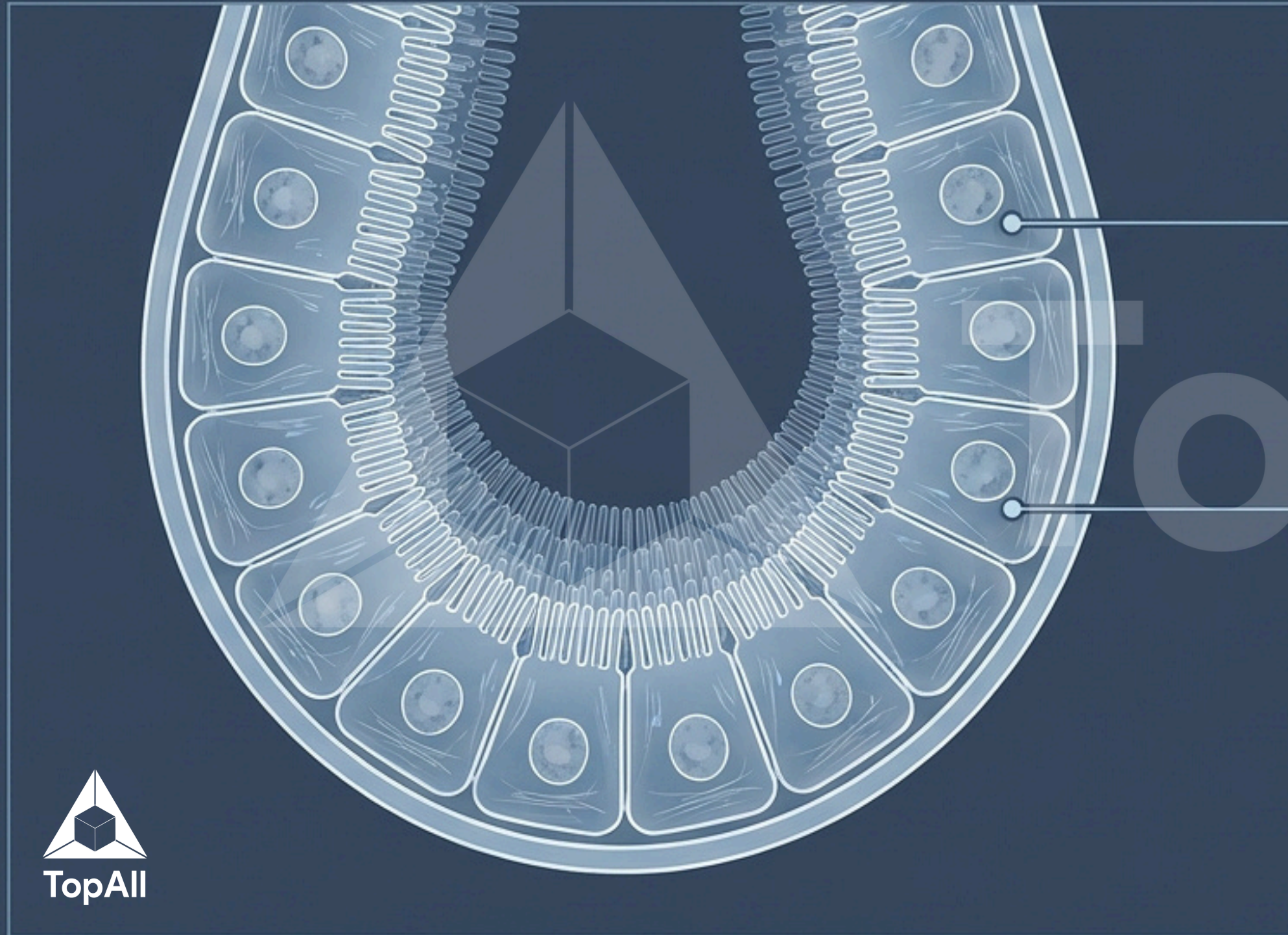
Where Filtrate Becomes Urine

The micro-anatomy and functional journey of the nephron tubules.



Water (H₂O) Electrolytes (Na⁺, K⁺, Cl⁻) Nutrients & Buffers (Glucose, Amino Acids, HCO₃⁻) Secreted Wastes (H⁺, NH₃, Urea)

PCT: The Major Reabsorption Site



Form: Simple cuboidal brush border epithelium.

Function: Increased surface area designed for maximum reabsorption.

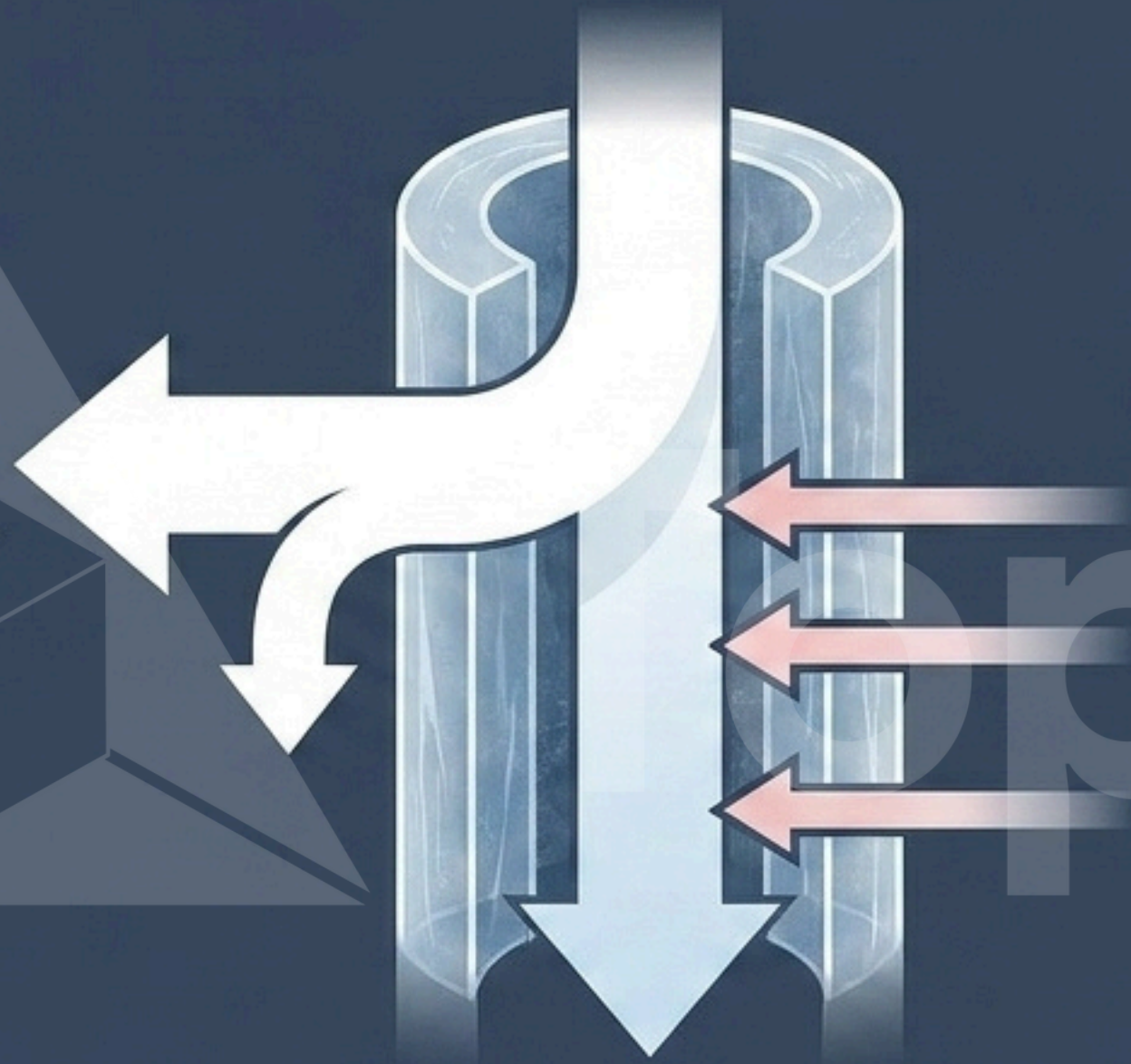


Nutrients and Buffers
Actively reabsorbs nearly all of the essential nutrients (glucose, amino acids).

70–80% Electrolytes and Water



Massive extraction of
Water, Electrolytes,
and Bicarbonate HCO_3^-



Selective injection of
Hydrogen H^+ and
Ammonia NH_3



TopAll

Insight

This bulk exchange is crucial for maintaining the initial pH and ionic balance of body fluids.



**You've Learned the Theory.
Let's Test Them Now.**

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

Practice Now



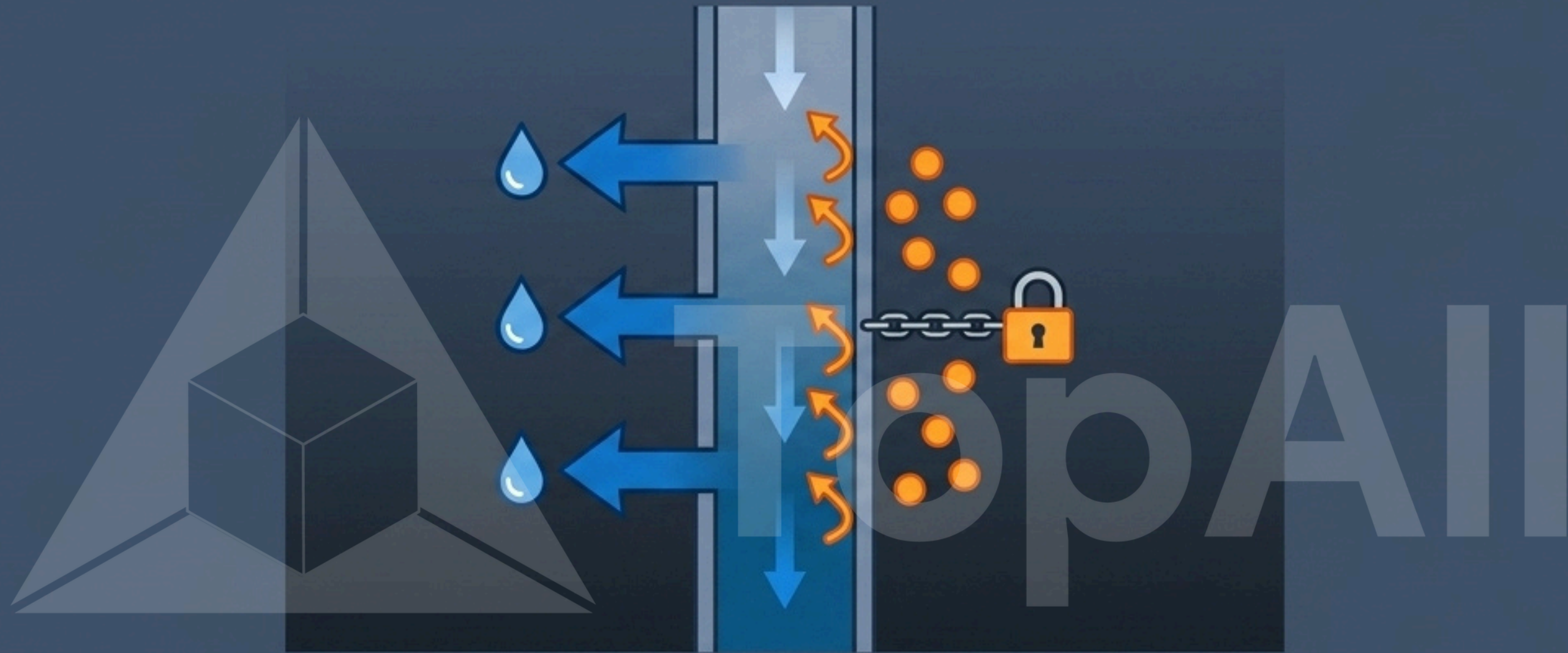
At prep.topall.app

Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



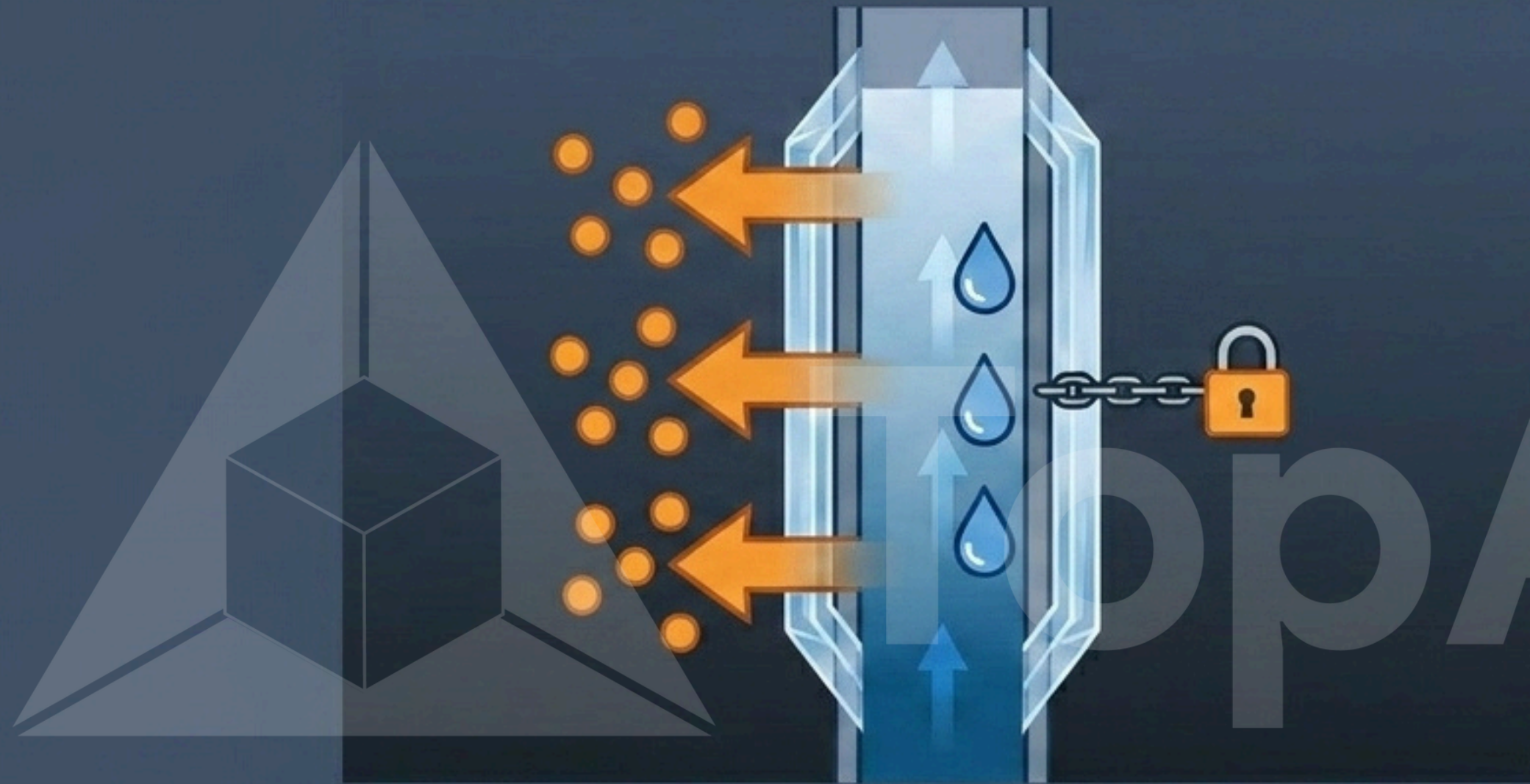
Henle's Loop: Descending Limb



Core Mechanism:
Permeable to water.
Impermeable to electrolytes.

The Result:
As water is drawn out into the high-osmolarity interstitium, the remaining filtrate becomes highly concentrated as it moves down.

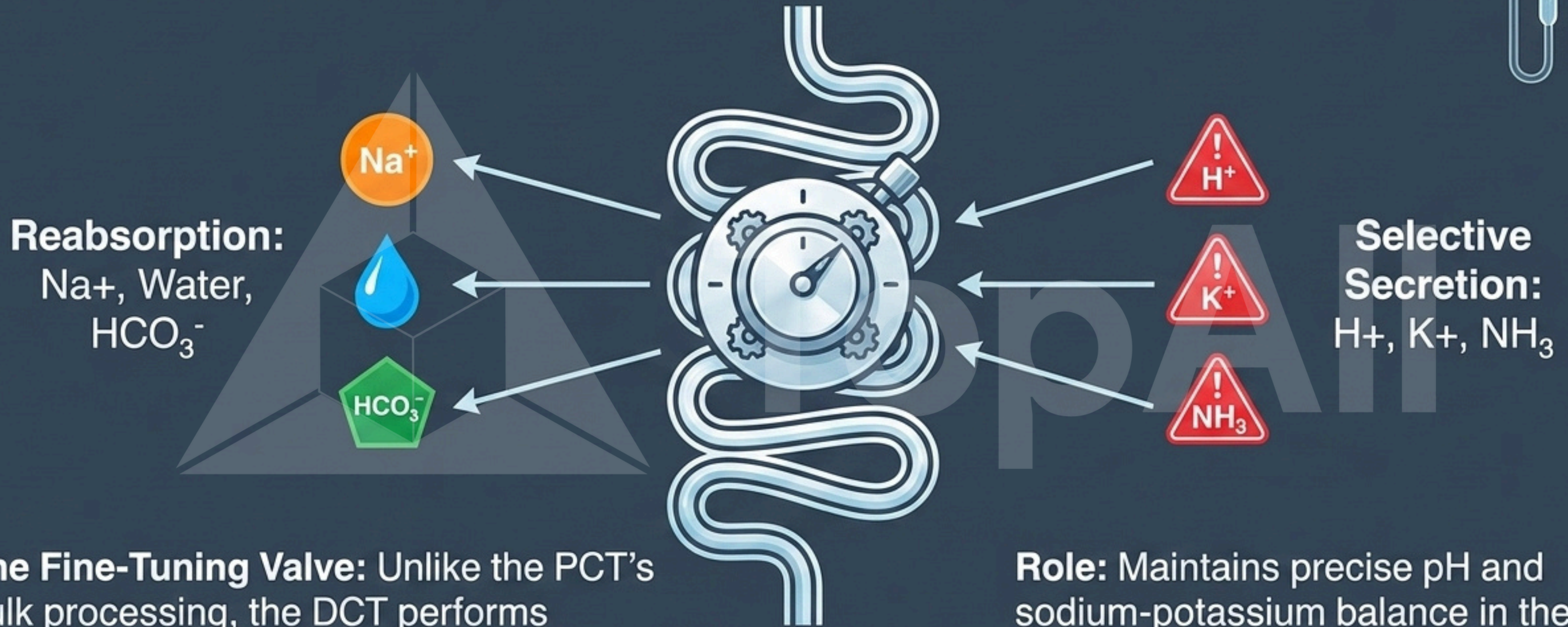
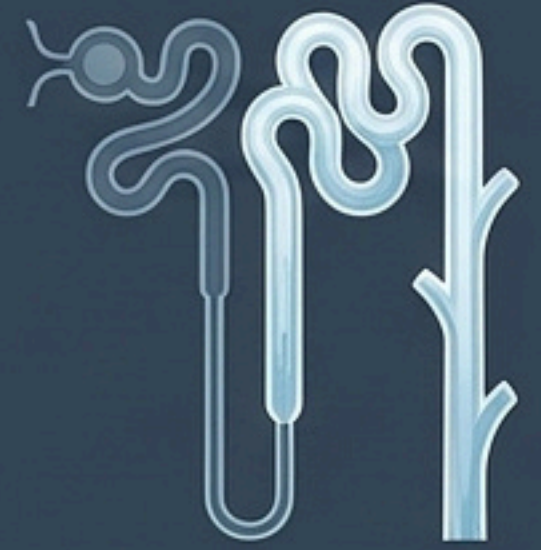
Henle's Loop: Ascending Limb



Core Mechanism:
Impermeable to water.
Transports electrolytes.

The Result:
The concentrated filtrate gets diluted as it passes upward, while these exiting electrolytes fuel the medullary fluid's high osmolarity.

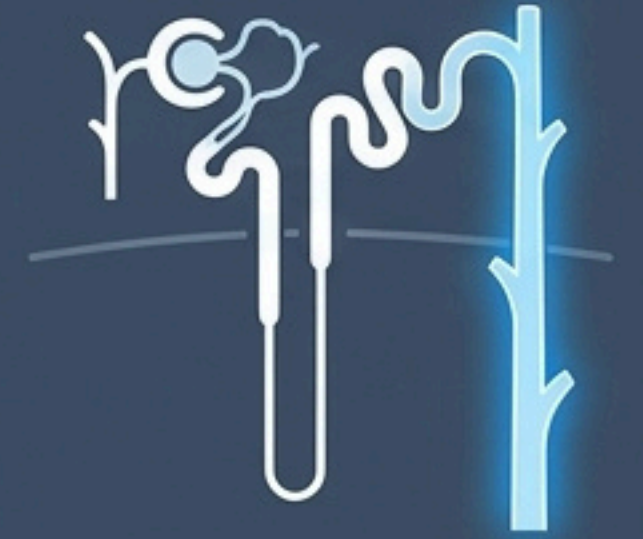
DCT: Conditional Reabsorption & Secretion



The Fine-Tuning Valve: Unlike the PCT's bulk processing, the DCT performs conditional reabsorption based on the body's immediate needs and hormonal signals.

Role: Maintains precise pH and sodium-potassium balance in the blood.

Collecting Duct: Concentrated Urine



Action 1:

Large amounts of water are reabsorbed here to produce highly concentrated final urine.

Action 2:

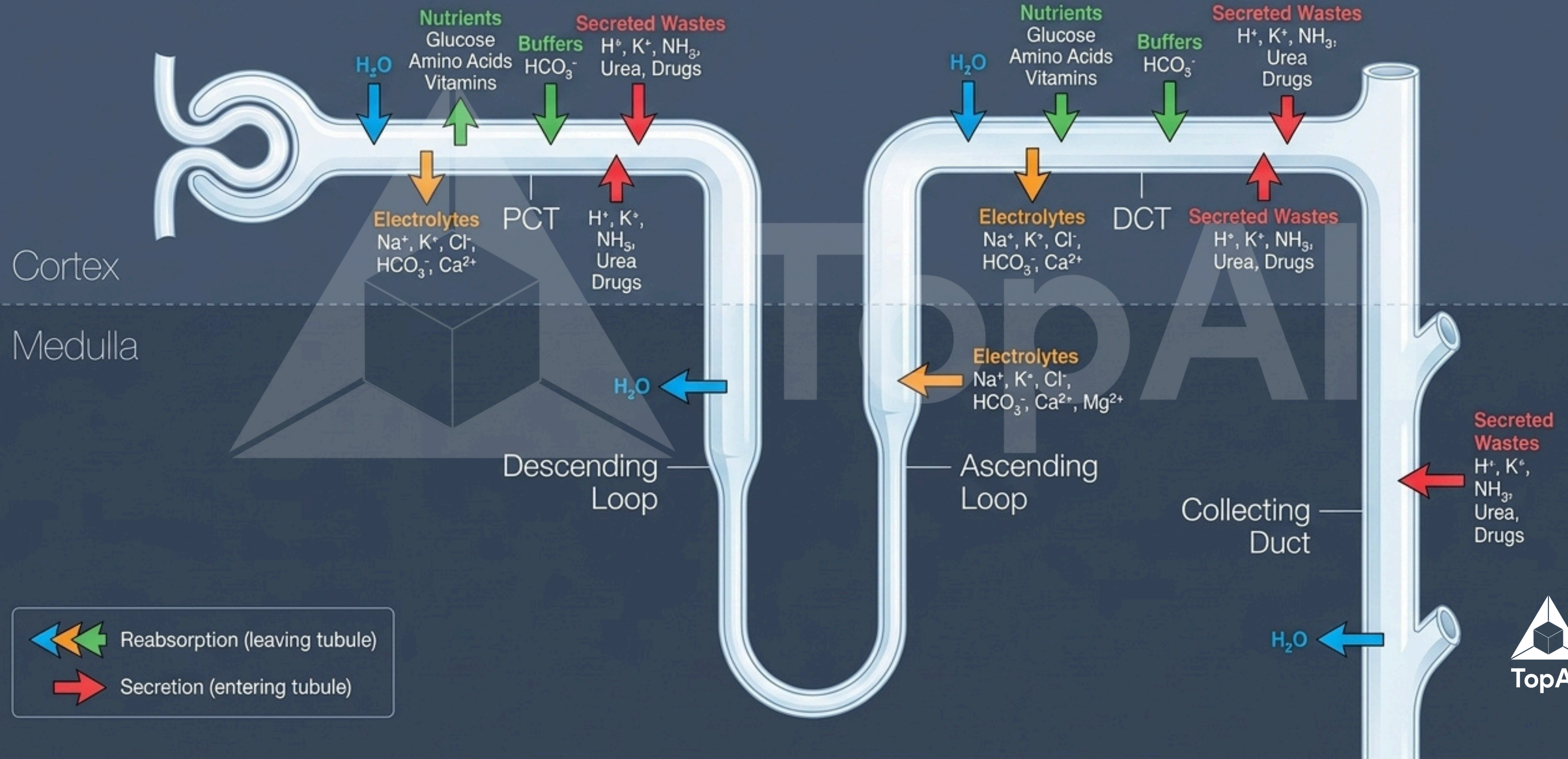
Allows a small passage of Urea into the medullary interstitium to maintain the deep osmotic gradient.

Action 3:

Final selective secretion of H^+ and K^+ for ionic balancing.

The Complete Master Flow

You Are Here



Key Takeaways: Tubule Segment Properties

You Are Here



Segment	Water Permeability	Electrolyte Permeability	Primary Role
PCT	 High	 High	Bulk Reabsorption (70-80%) & Secretion
Descending Limb	 High	 Zero	Concentrates Filtrate (osmosis)
Ascending Limb	 Zero	 High	Dilutes Filtrate (transport)
DCT	 Conditional	 Conditional	Fine-tuning & pH balance
Collecting Duct	 High	 Low	Final concentration & Urea Urea recycling



You've Learned the Theory.

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