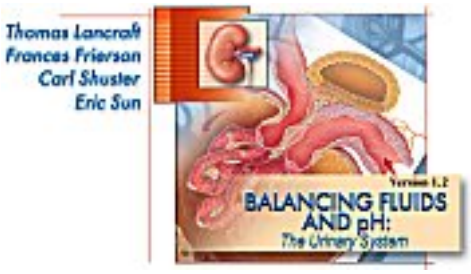
Renal Absorption and Secretion



Directions:
a. Click the *"Contents"* button.
b. Open the *Urinary System* File.
c. Click *Animations.*
d. Click *Renal Absorption and Secretion.*

Introduction

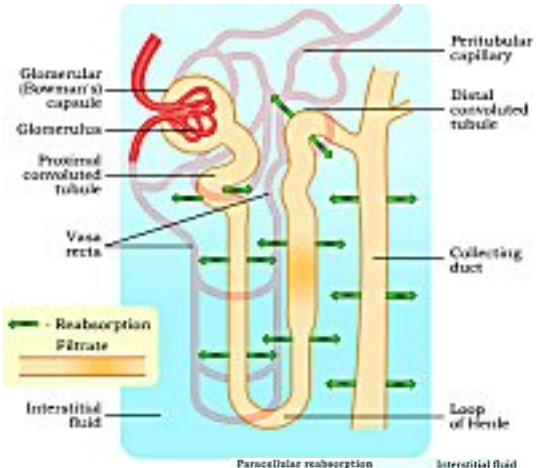
1. Where does renal *absorption* and *secretion* occur? _____

2. Define what happens during these processes.

   a. absorption - _____

   b. secretion - _____

3. Due to very high glomerular filtration rates, nearly the entire volume of the blood enters the renal tubules every 30 minutes. Obviously, most of it must be reabsorbed to avoid dehydration.



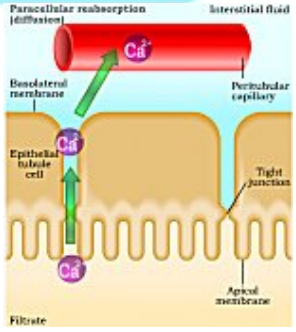
   a. What part of the tubule achieves most of the reabsorption?

   _____

   b. Where does further reabsorption and "fine tuning" occur? _____

   _____

4. a. Describe *paracellular reabsorption.* _____



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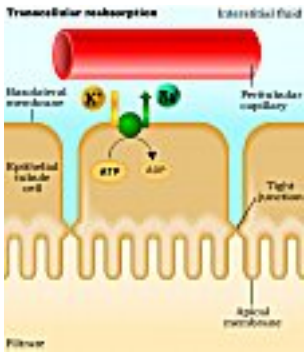
   b. Describe transcellular reabsorption. _____



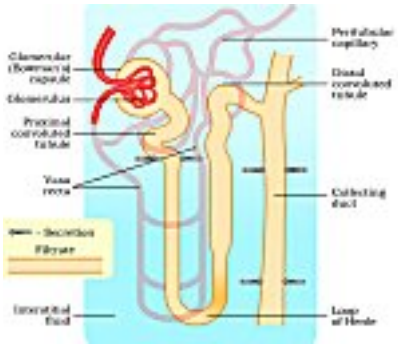
   _____

   _____

   c. What kind of transport mechanisms are used for reabsorption? _____

   _____

5. a. Identify two reasons that make secretion important.

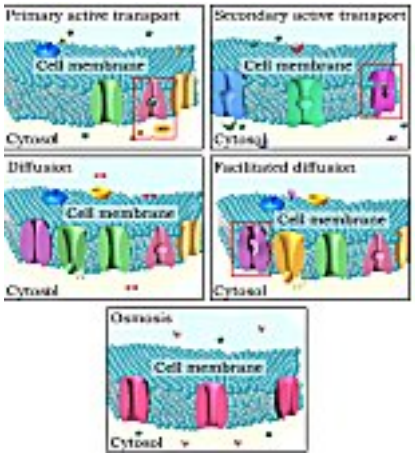


- _____
- _____

b. What kind of transport mechanisms are used for secretion? _____

_____

Renal Transport Mechanisms



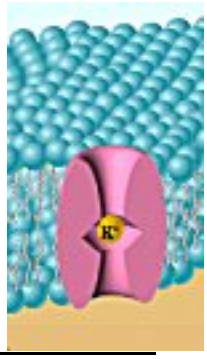
6. Identify 5 renal transport mechanisms.

_____ _____

_____ _____

_____

7. a. Describe the role of *primary active transport* with regard to sodium ions Na^+.



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b. Describe the role of primary active transport with regard to potassium (K^+) and hydrogen (H^+) ion movement.

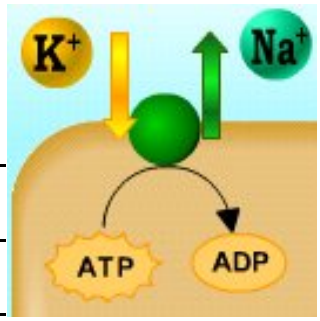
_____

_____

c. Why is Na^+ movement important with regard to movement across the membrane? _____

_____

8. a. The energy stored in the sodium ion electrochemical gradient is used to transport other molecules back toward the bloodstream (reabsorption). What nutrients are transported in this fashion?



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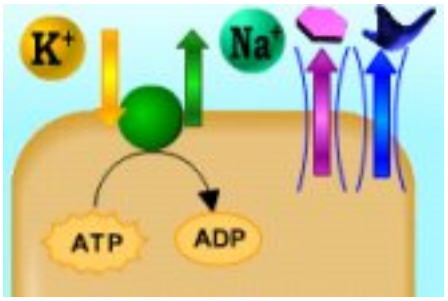
_____

b. How does the sodium gradient affect hydrogen ion movement? _____

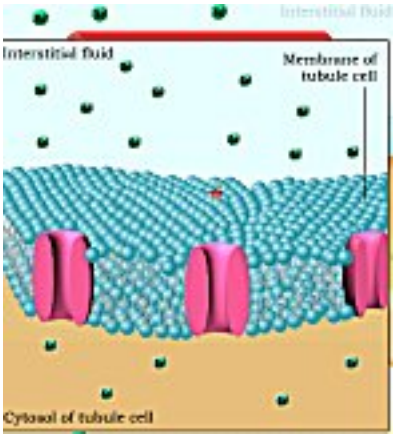
_____

9. Describe the role of transporter proteins with regard to nutrient movement.



10. Describe ion movement through or between the cell membranes into the interstitial fluid.

11. a. What determines the direction of water movement? _____



b. Why does increased water reabsorption affect ion and urea movement?

Reabsorption

12. Identify reabsorption locations along the nephron. _____

13. Describe reabsorption at the proximal convoluted tubule. _____

14. a. Describe how the sodium gradient determines reabsorption. _____

b. How is this gradient maintained? _____

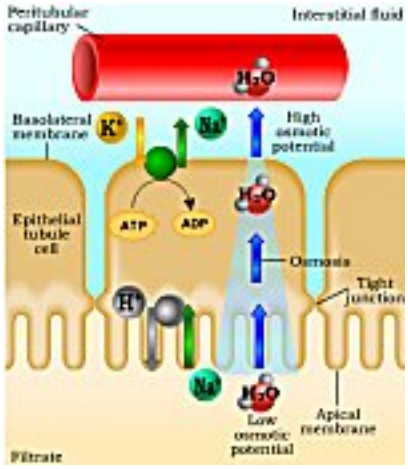
15 Describe reabsorption of glucose, amino acids, and vitamins. _____

16. Describe forces that facilitate reabsorption of bicarbonate (HCO_3^-) _____

17. Describe how sodium ion concentrations affect movement of other ions and nitrogenous wastes. _____

_____

18. How does the ion and nitrogenous waste concentrations affect water movement?



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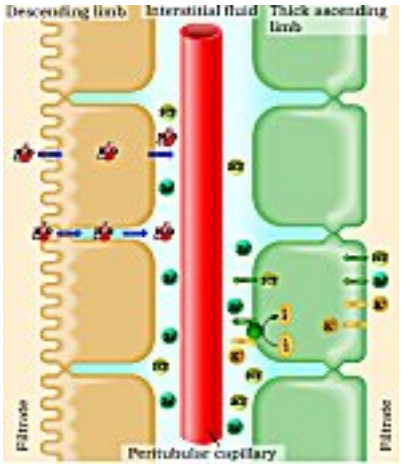
19. Describe reabsorption along the descending limb of the loop of Henle.



_____

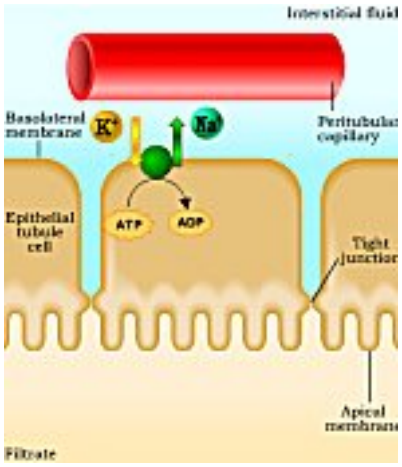
_____

b. Describe reabsorption along the ascending limb of the loop of Henle.

_____

_____

20. Describe reabsorption along the distal convoluted tubule. _____



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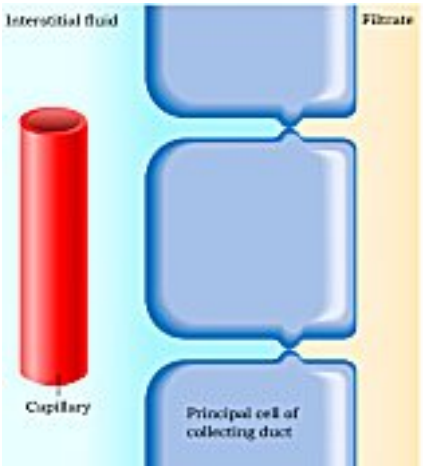
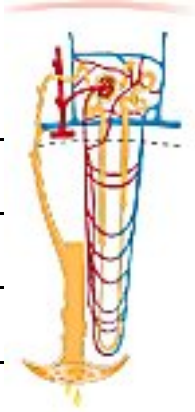
_____

21. Describe reabsorption via sodium/potassium pump activity along the collecting duct. Include hormonal influences in your description.

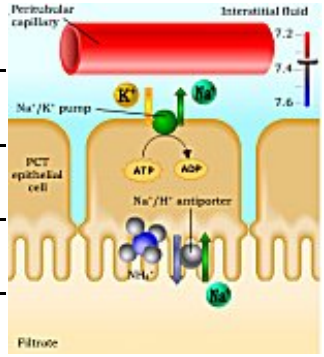


Secretion



22. Where does *secretion* occur? _____

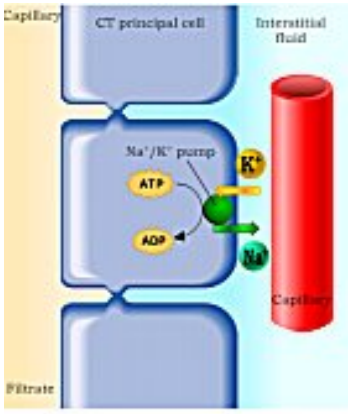
23. a. Describe H^+ and NH_4^+ ion secretion into the urine. _____



b. What affect does removal of these ions have on blood pH? _____

24. a. What solutes are secreted at the collecting duct? _____

b. Describe how potassium ions (K^+) are secreted from the blood into the urine.



Summary of Filtrate Processing

25. a. What happens during *early filtrate processing*? _____

_____

b. Describe the filtrate condition by the time it reaches the distal convoluted tubule.

_____

_____

c. Contrast the osmolarity of DCT filtrate and that of blood. _____

_____

d. Why is the reabsorption level through the DCT called "obligatory?" _____

_____

e. Describe *late filtrate processing*. _____

_____

_____

_____

f. What regulates late filtrate processing? _____