

## RENAL FUNCTION II

COURSE: Systems Biology, BMSC 414, Tissue and Organ Function

LECTURE: Lecture 22, Renal Function II

DATE: Thurs., Nov. 15, 2007, 10:00-11:30 AM

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### REQUIRED READING ASSIGNMENT:

Costanzo's Physiology, Third Edition, 2006, Chapter 6 (pp. 257-297)

### LEARNING OBJECTIVES

1. To know the two pathways by which substances can enter the renal tubules and two pathways by which substances can exit the renal tubules.
2. To understand how the kidney processes desirable substances like glucose, not permitting any of the filtered substance to be lost to the urine.
3. To clearly differentiate between renal plasma threshold, tubular transport maximum, and splay.
4. To detail the renal handling of excesses and deficits of salt and water by the recruitment of hormones and nervous system signals.
5. To explain how the renal system generates a deep medullary concentration gradient that is mandatory for the reabsorption of water.

### REVIEW QUESTIONS

1. Can you define reabsorption and secretion and describe where these processes are taking place in the kidney (name tubule segment and capillary bed)?
2. Can you draw the titration curves for glucose including the filtered, reabsorbed and excreted curves labeling RPT,  $T_m$  and splay?
3. Can you draw the titration curve for para-aminohippuric acid (PAH) including the filtered, secreted and excreted curves labeling RPT,  $T_m$  and splay?
4. Can you name and describe the interactions of the five organs that mount an appropriate response to a severe loss in blood volume (hemorrhagic shock)?
5. What are the signals for the release of antidiuretic hormone (ADH) and what is ADH's effect on the kidney with respect to water and salt?