

## HST.035 Homework Assignment #4

(Due March 20<sup>th</sup>)

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PLEASE PRINT YOUR NAME:

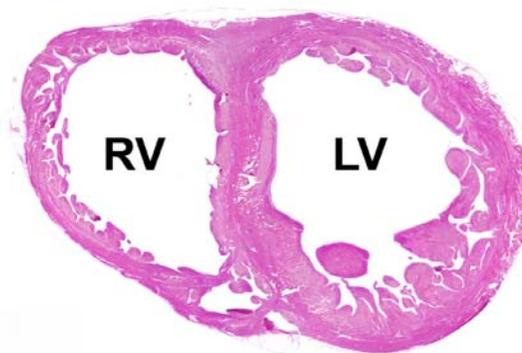
1. For each of the classic clinical features described below, choose between nephrotic (O) and nephritic (I) syndromes:

Feature	O or I?
Proteinuria >3.5 grams per day	O
Oliguria	I
Hematuria	I
Edema	O
Lipiduria	O
Hypertension	I
Hypoalbuminemia	O
Hyperlipidemia	O

2. The cross section of an abnormal heart from a 5-year-old boy is shown on the right.

2a. What is the most appropriate pathological diagnosis for this heart?

*Dilated cardiomyopathy (the abnormality is diffuse and both chambers are markedly dilated)*



2b. Which of the following could have resulted in this pathological process? (More than one answer may be possible.)

- Atherosclerotic coronary artery disease (would result in a focal lesion)
- ***A genetic mutation affecting calcium regulation in the heart***
- ***Myocarditis***
- Aortic stenosis (would result in isolated left ventricular hypertrophy)
- Mitral regurgitation (would result in isolated left ventricular dilatation)

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3. Does contact between platelets and the subendothelial basement membrane always result in initiation of the coagulation cascade? If not, give an example of a normal anatomic site where it doesn't.

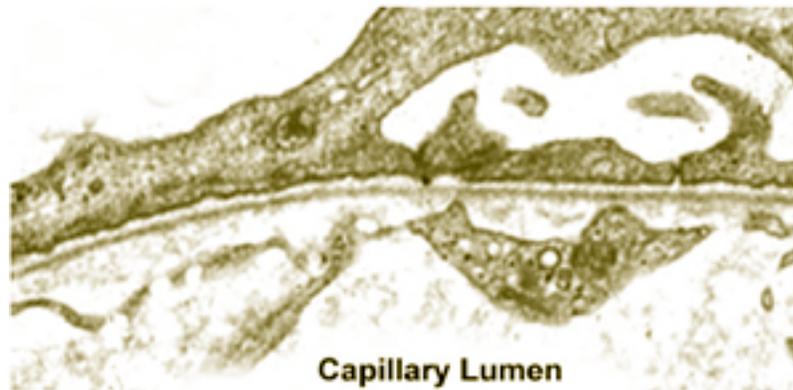
*No! Platelets are in contact with the basement membrane in all fenestrated vessels such as liver sinusoids and kidney glomeruli. It is only the "abnormal" exposure of the basement membrane that results in activation.*

4. Once initiated, why doesn't a blood clot spread through the entire vascular system? (Describe at least two mechanisms by which the clotting process is limited/terminated.)

*Several limiting processes exist:*

- *Dilution of coagulation factors by flow*
- *Hepatic clearance of activated proteins*
- *Activation of antithrombin and other proteolytic proteins*
- *Activation of the fibrinolysis pathway*

5. The electron micrograph shown below is from the kidney of a 3-month-old baby who developed massive generalized edema.



What are the most prominent structural abnormalities in this EM? (Why is this not a case of Minimal Change Disease?)

- *Effacement/fusion of foot processes*
- *Marked thinning of the basement membrane (not a feature of the typical minimal change disease)*