Introduction to Histology: Digestive System

Pre-laboratory Questions

1. What is the main function of the accessory organs in the digestive system?
   Accessory organs are organs that secrete substances that chemically digest food.

2. Which part of the digestive system is the longest?
   The small intestines are the longest part of the digestive system. It is narrow and is about 20 feet long.

3. Why does the small intestine have both longitudinal and circular muscles?
   They have both longitudinal and circular muscles because it aids in digestion of food particles. The food will be pushed through the small intestines with the muscles, and the circular form will slow down the movement so absorption of nutrients can occur.

4. What are villi, what is their function and in which layer can we find them and in which tissue?
   Villi are finger-like projections that line the small intestines. The function of these structures is to absorb nutrients from the digested food. They will do so by helping increase the surface area of the intestinal walls. Villi will also aid in transferring proteins to all cells and tissues of the body. Villi can be found in the innermost layer of the small intestines called the mucosa. They will be found in tissues like the mucous membrane or the plicae circulares.

5. What substance cannot be easily absorbed by the blood stream and through which systems does this then enter the body?
   Large and hydrophobic long-chain fatty acids have a harder time being absorbed by the blood stream. Bile salts and lecithin will help with this problem by enclosing them in micelle. Micelle is a tiny sphere with hydrophilic ends facing the watery environment and the hydrophobic tails turned to the interior. This helps it become absorbed easier.

6. What is the name of the cells which make up the cords in a liver lobule?
   The cells in the liver lobule are the hepatocytes, hepatic parenchymal cells, Kupffer cells, and the liver sinusoidal endothelial cells. The hepatocytes are the main ones that make up the cord.

7. What is the function of the sinusoids and what do they contain?

   Sinusoids are capillary-like structures that are a passageway for blood to travel through. Materials can be exchanged directly with hepatocytes. It feeds deoxygenated blood into the hepatic vein as well. Sinusoids contain Kupffer cells and endothelial cells.

8. Where can we find Kupffer cells and what is their main function?

   Kupffer cells are found in the lining of the sinusoids in the liver. They are also called the reticuloendothelial cells. Kupffer cells are phagocytosis which means that they can ingest other cells or foreign particles. They are known as the first innate immune cells of the liver, and they protect the liver from bacterial infections. They also remove dead red and white blood cells.

9. What type of tissue separates the liver lobules and in which structure can these be found?

   The connective tissue septae is what separates the liver lobules. The lobules form an irregular polygonal shape. Lobules are better seen in pig liver. It is harder to see it under a microscope for a human liver. Lobules do not have distinct boundaries in human livers.