

Shark Anatomy

Grade Level: 6 – 8

Dissection Manual

Photo Credit: Lori Timm, Ph.D. – Landry's Downtown Aquarium

Prep for Dissection

1. Place the shark with the dorsal side down.
2. Use scissors to make a longitudinal cut down the midline from the cloaca to the transverse septum on ventral side (Figure 1).
3. Cut through the transverse septum with the scissors to expose the heart. The transverse septum is a cartilaginous septum that separates the body cavity and the heart cavity. As you cut through septum be careful not to puncture the heart.
4. Next, make two transverse (horizontal) cuts: one above the cloaca and one below the transverse septum (Figure 1). This keeps the sides open so you can view the internal organs.

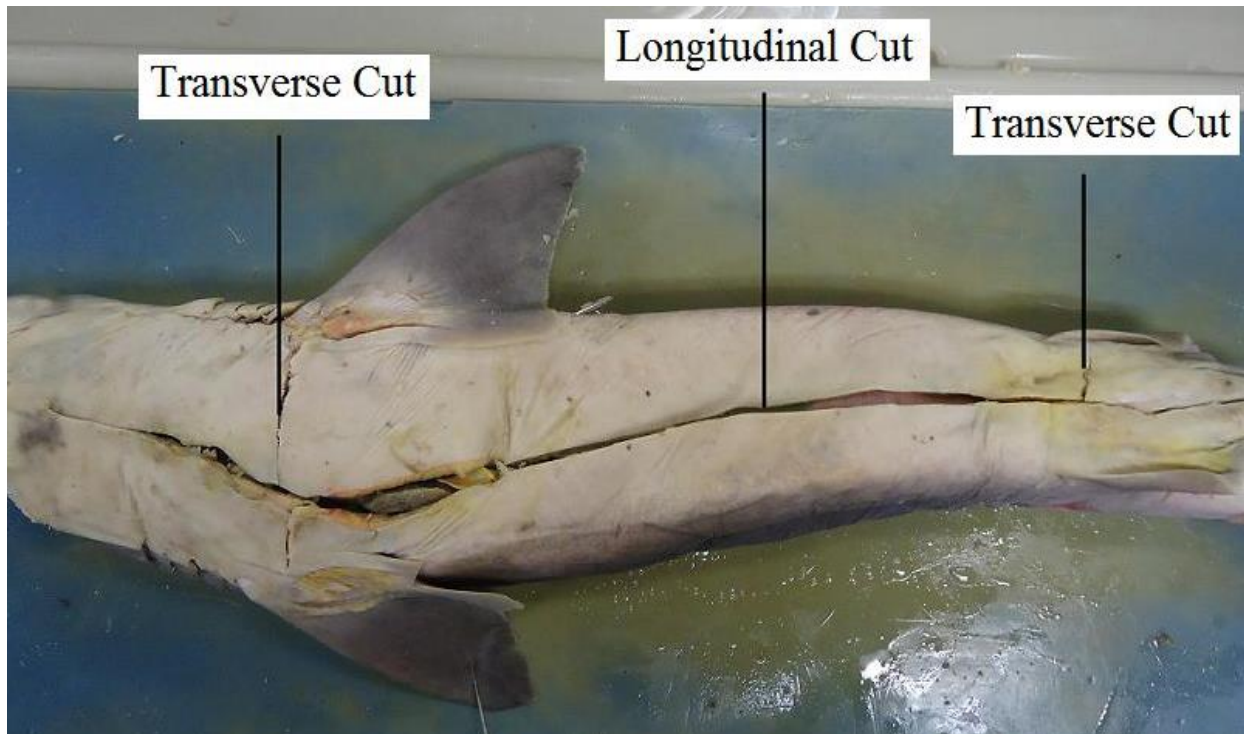


Figure 1. Longitudinal and transverse cuts to open shark.

5. To expose the respiratory system, cut along the lateral side of the mouth, through the external gill slits (Figure 2) with scissors.



Figure 2. Cut to expose respiratory system of the shark.

6. Make a transverse cut under the transverse septum, keeping the heart cavity intact (Figure 3). Be careful of the sharp teeth.

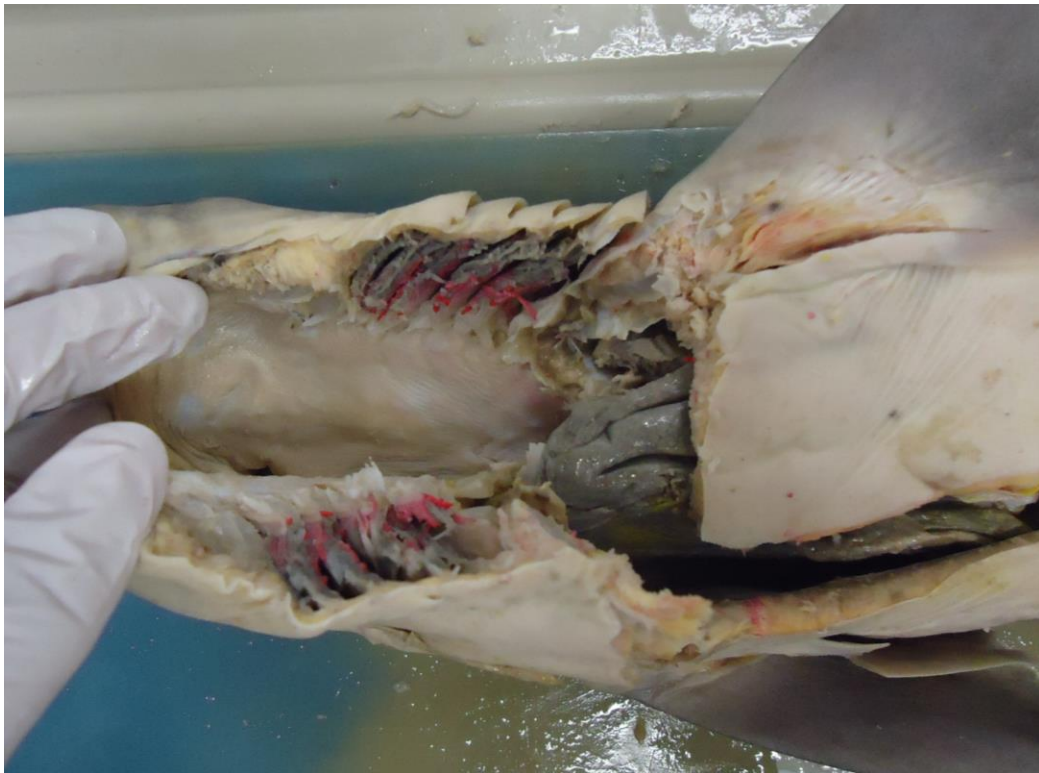


Figure 3. Cut to illustrate opening of the respiratory system.

7. Use the following photos to identify structures in your shark and/or on your worksheets.

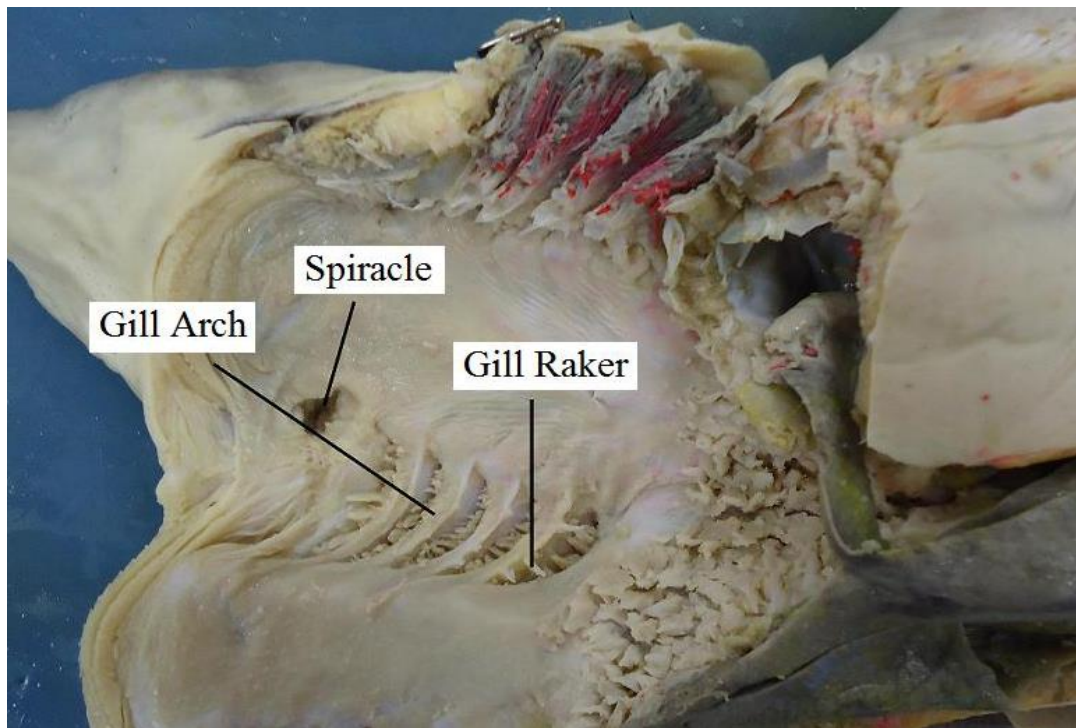


Figure 4. Internal Respiratory Anatomy.

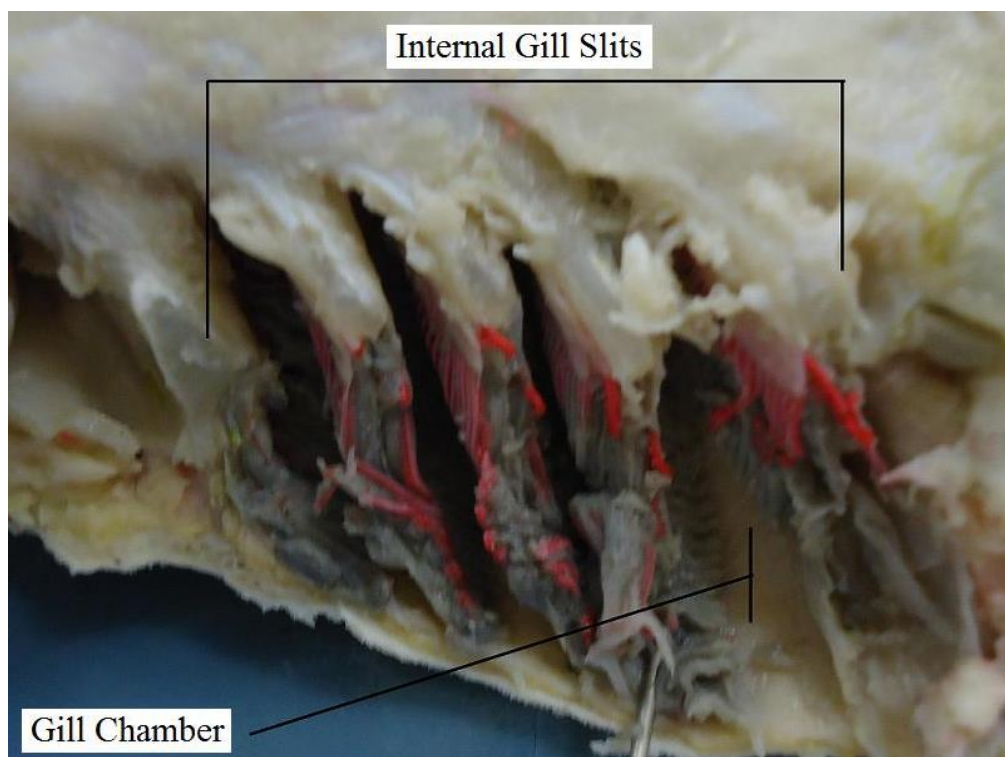


Figure 5. Internal Gill Slits.

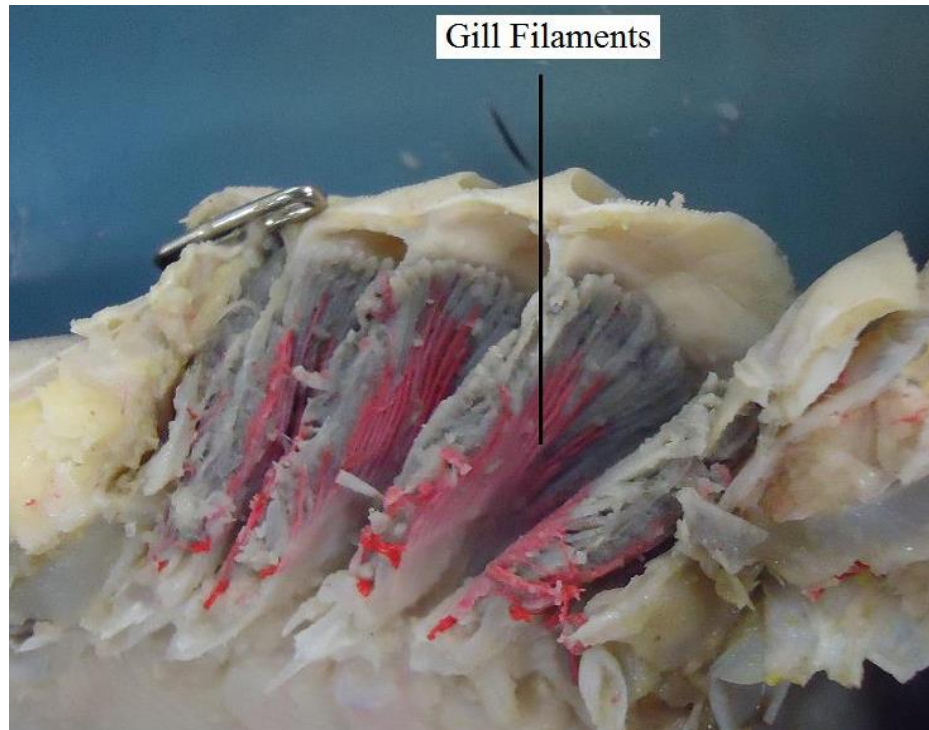


Figure 6. Gill Filaments. Filaments are partially red because the blood is oxygenated.

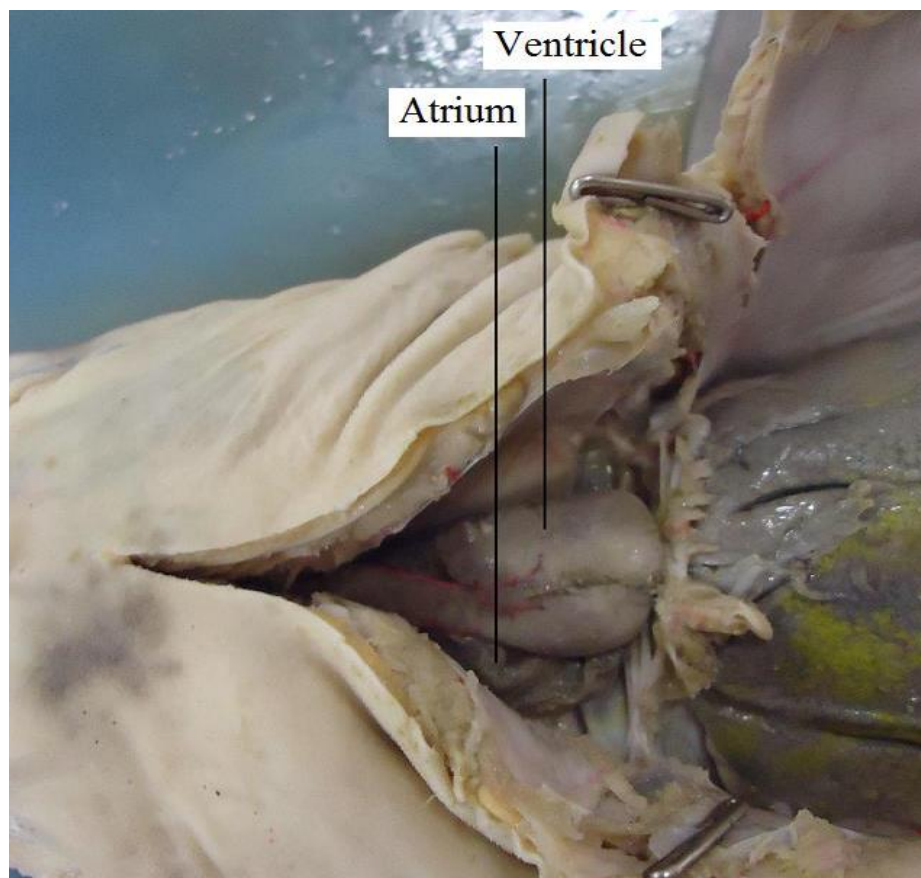


Figure 7. Two-chambered heart.

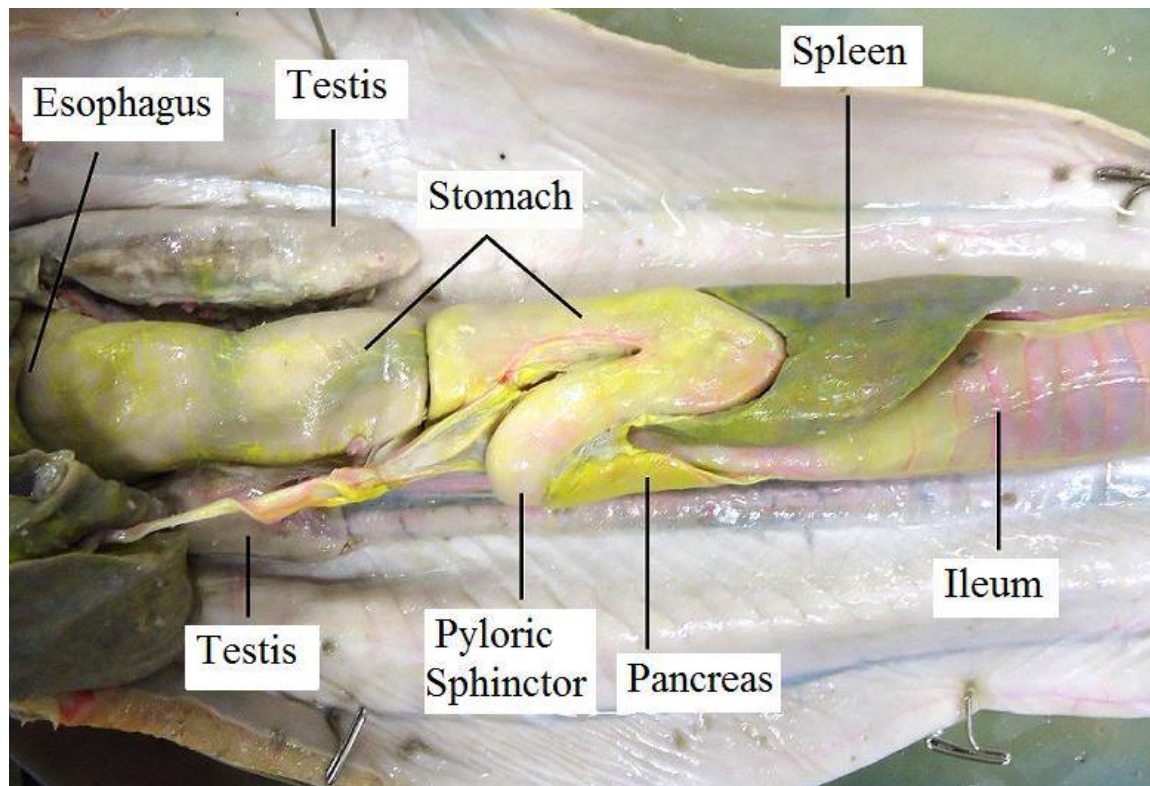


Figure 8. Internal anatomy of the body cavity.

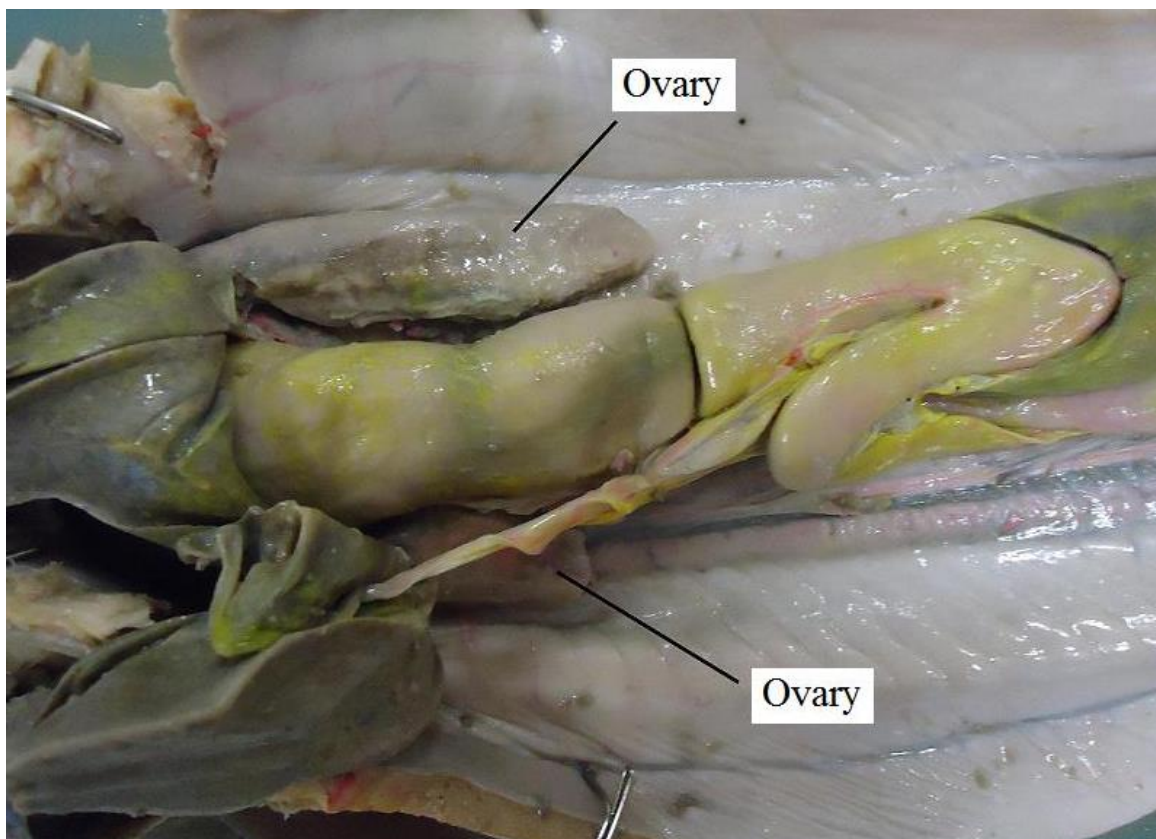


Figure 9. Ovaries of a female. Ovaries and testes look similar in immature sharks.

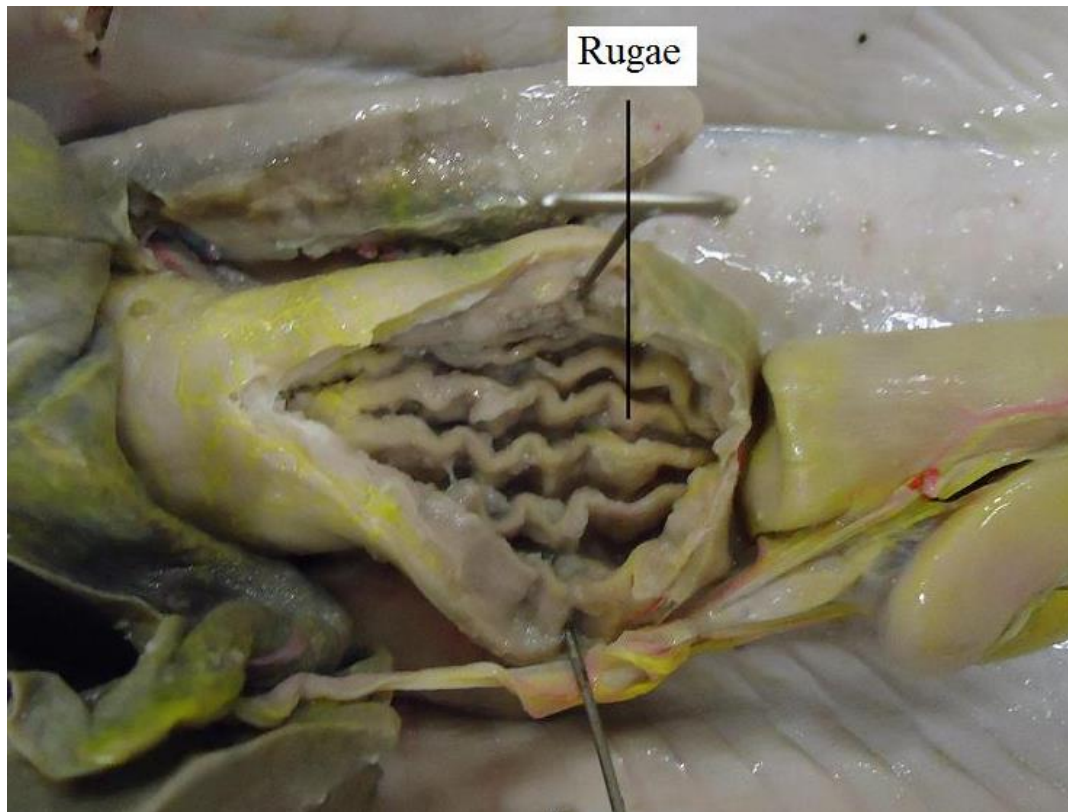


Figure 10. Rugae of stomach. These folds increase the surface area.

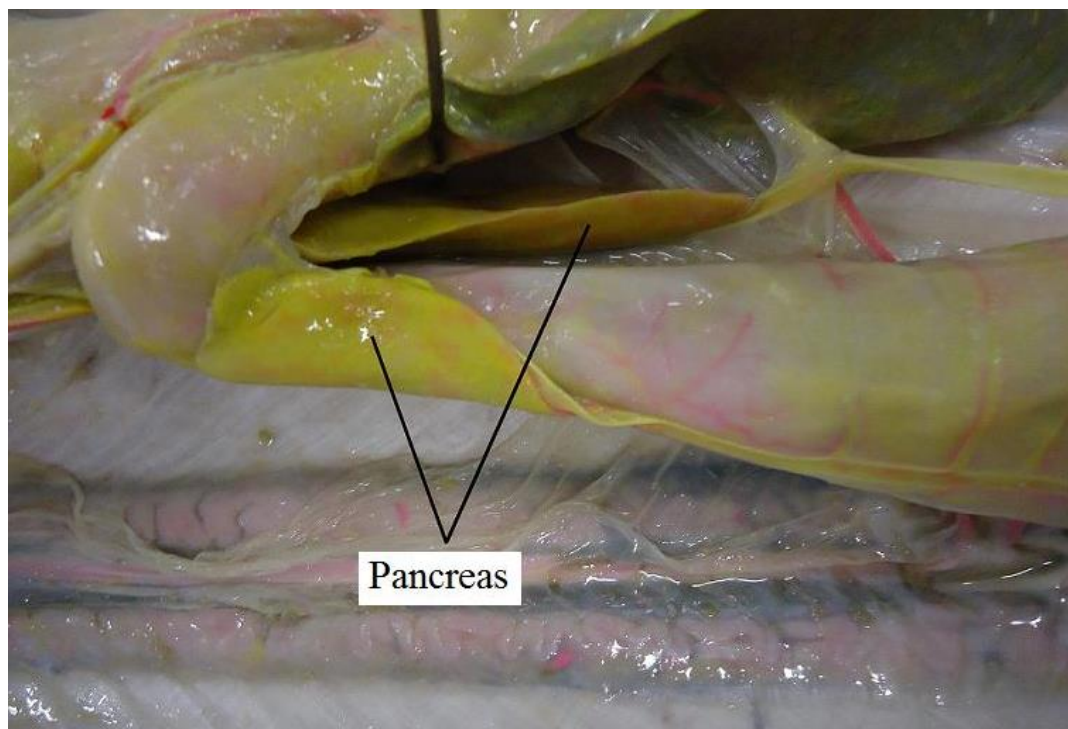


Figure 8. Two lobes of the pancreas. The pancreas wraps around the duodenum.

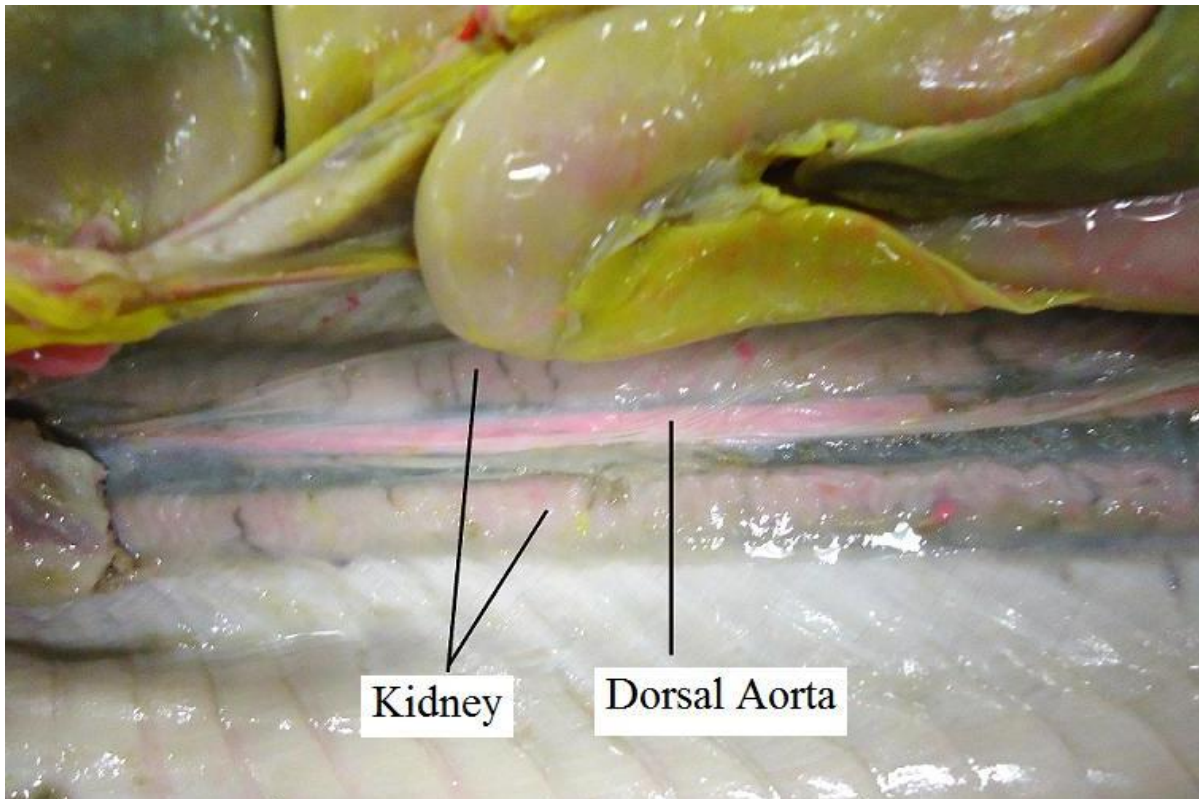


Figure 9. Kidney and dorsal aorta.



Figure 10. Three lobes of the liver.

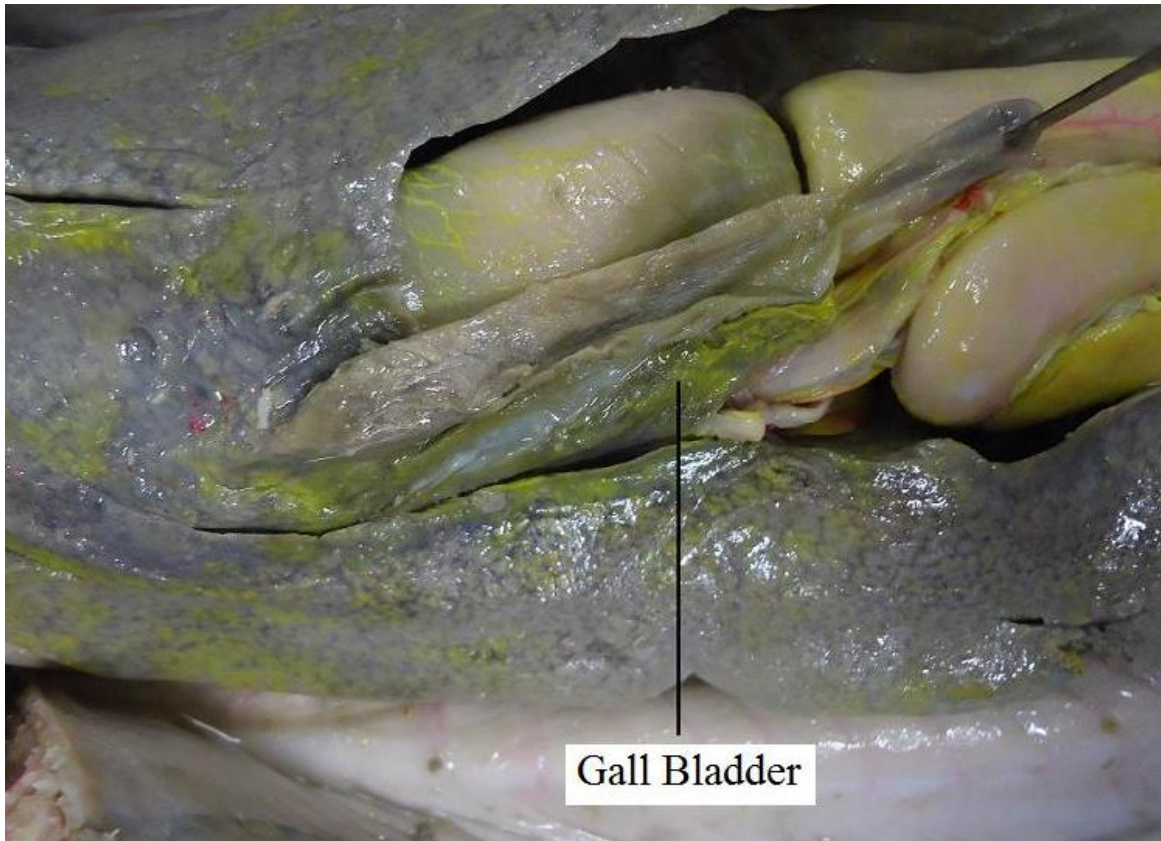


Figure 11. Gall bladder is located on the middle lobe of the liver.

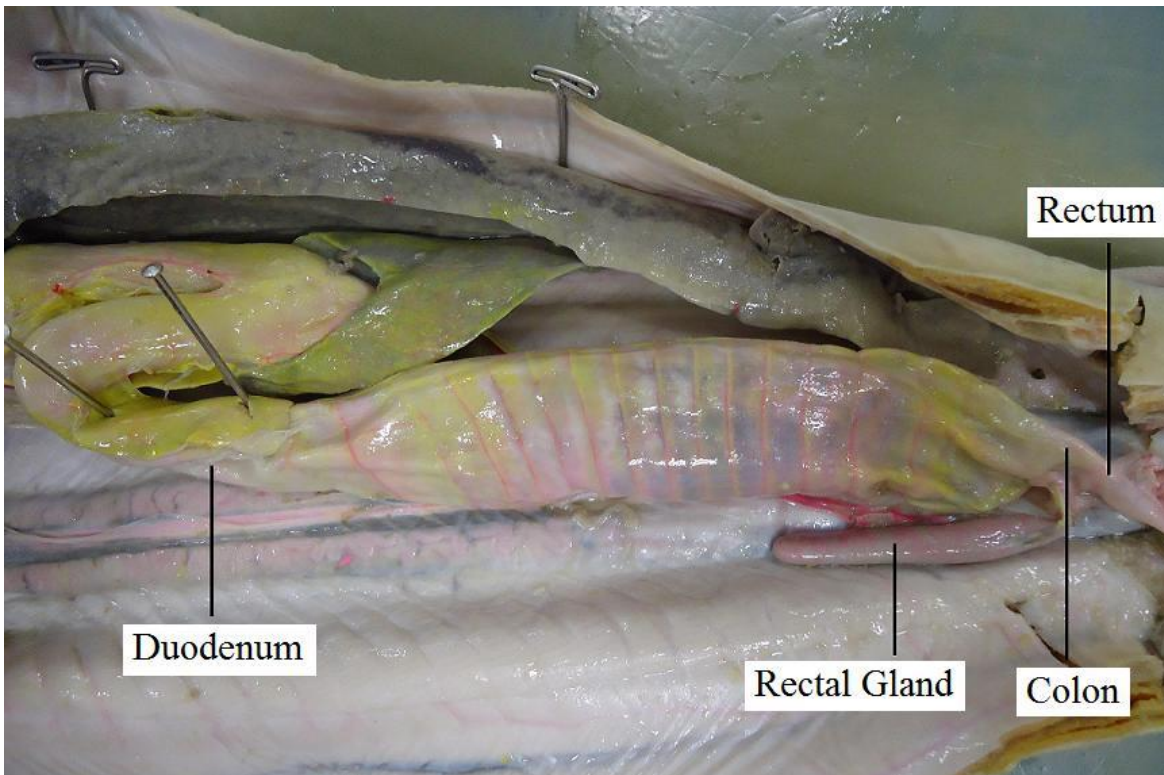


Figure 12. Internal anatomy of lower body cavity.

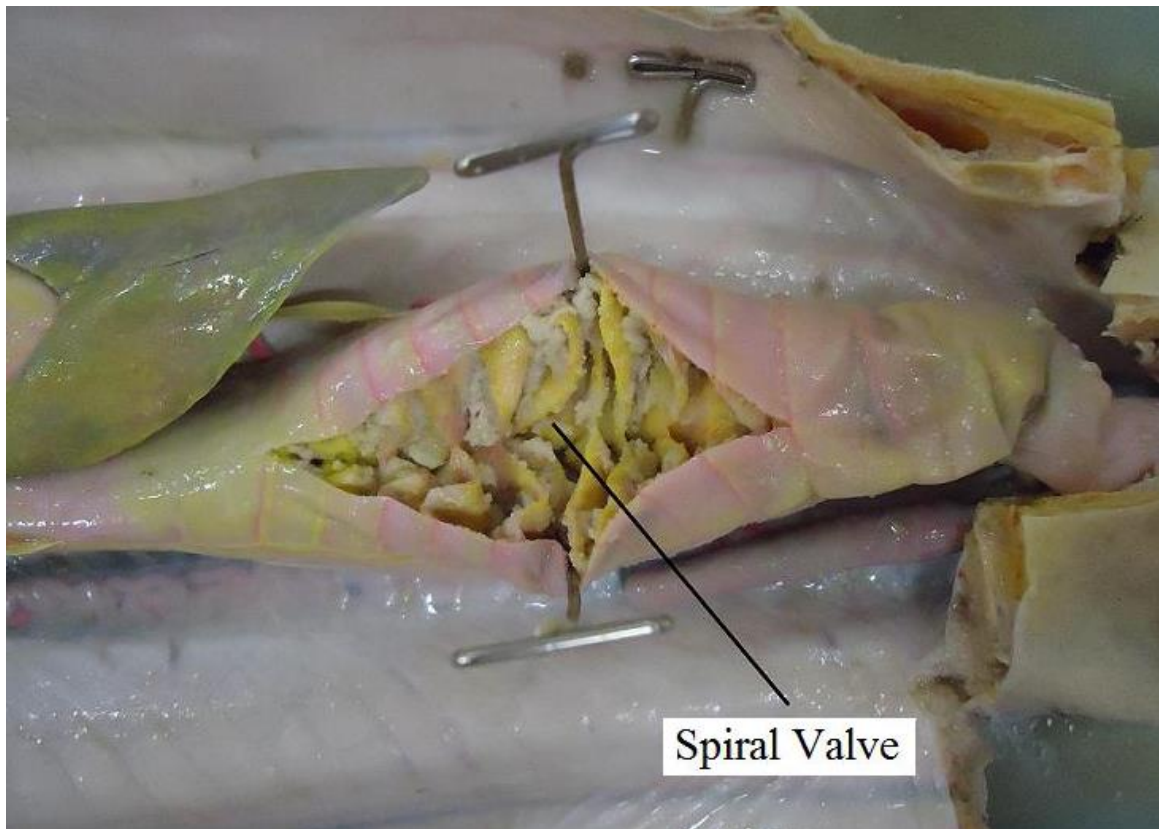


Figure 13. Spiral valve located inside the ileum.

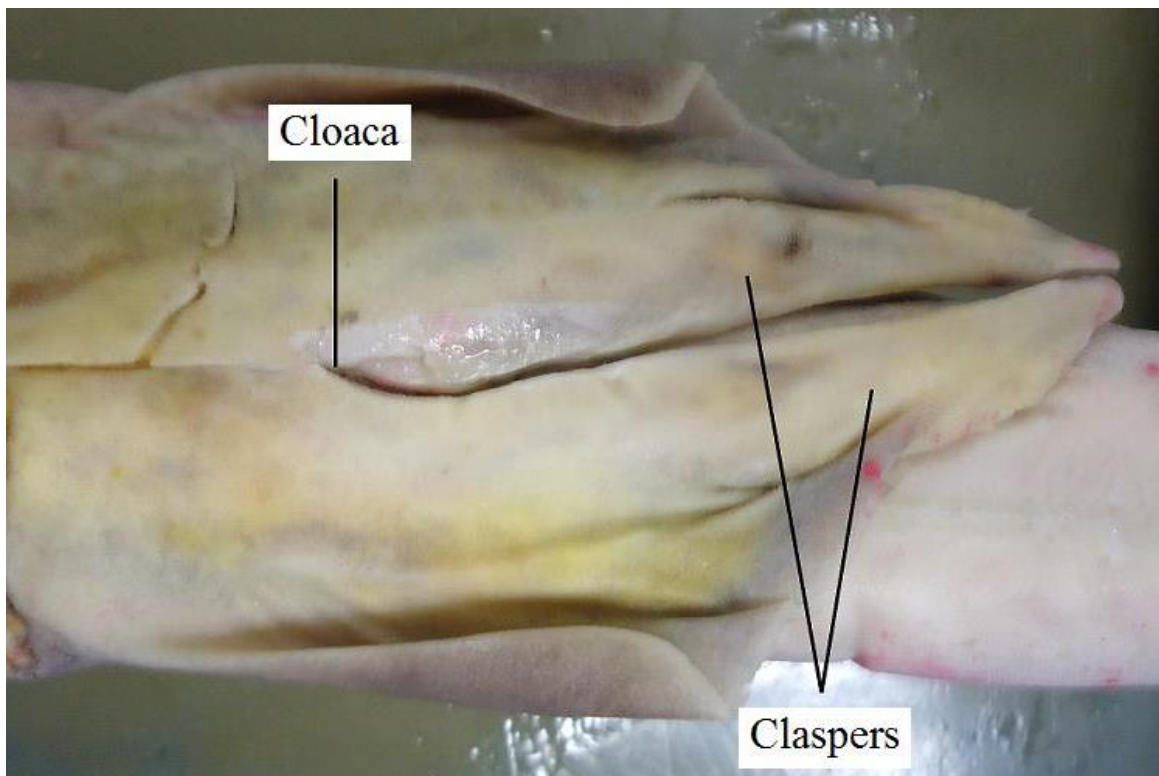


Figure 14. Claspers of a male and cloaca.

Structure, function, system for internal anatomy.

Structure	Function	System
Gall bladder	Stores bile produced by liver	Digestive
Liver	Production of bile; cleans out toxins; provides buoyancy	Digestive
Esophagus	Food travels from the mouth to the esophagus and into the stomach	Digestive
Stomach	Breakdown of food	Digestive
Pyloric sphincter	Controls passage of chyme (digested food) from stomach into duodenum	Digestive
Rugae	Increases surface area of stomach	Digestive
Duodenum	Breakdown of food by use of enzymes	Digestive
Ileum	Absorbs nutrients	Digestive
Spiral valve	Increases surface area so shark can absorb more nutrients; slows down digestion	Digestive
Colon	Water absorption	Digestive
Pancreas	Releases digestive enzymes (e.g., trypsin, lipase, and amylase) into duodenum	Digestive
Spleen	Production, storage, and destruction of red blood cells; destroys harmful bacteria and viruses; stores white blood cells	Immune
Kidney	Extracts urea from urine and returns the urea to the blood	Urogenital
Rectum	Absorbs water	Urogenital
Cloaca	Removes waste and reproductive cells	Urogenital

Testes	Sperm production	Urogenital
Claspers	Only on males; used for reproduction; sperm transfer	Urogenital
Ovary	Egg production	Urogenital
Rectal gland	Secretes a highly concentrated sodium chloride (salt) solution into rectum; balances salt concentration in body	Urogenital
Spiracle	Allows water to enter mouth when shark's mouth is closed	Respiratory
Internal gill slits	Brings in water for oxygenating gills	Respiratory
Gill rakers	Prevents food from entering gill chambers	Respiratory
Gill filaments	Gas exchange	Respiratory
Gill chamber	Space between gills	Respiratory
Gill arch	Provides support for gills	Respiratory
Dorsal aorta	Carries oxygenated blood to rest of body	Circulatory
Ventricle	Receives deoxygenated blood from the atrium	Circulatory
Atrium	Pumps deoxygenated blood to the ventricle	Circulatory