A Trout's Anatomy
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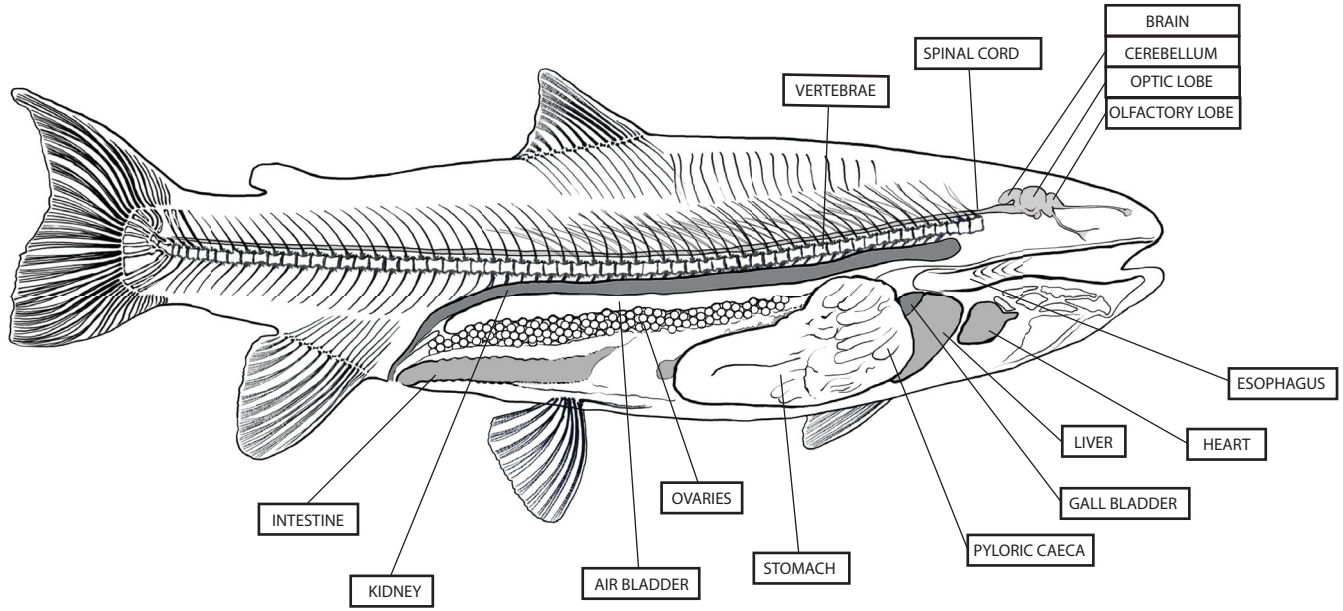

RAINBOW TROUT

Oncorhynchus mykiss

internal organs

Trout, like all animals have anatomical features that enable them to breathe, eat, see, move and reproduce. However, because trout are adapted for an aquatic environment there are some significant differences between trout and humans.

The brain has three major divisions: the olfactory lobe is located in the front and is used for smell and taste, the large optic lobe is used for sight and the cerebellum in the rear coordinates and regulates muscle activity. The spinal cord exits the rear of the brain and passes through the vertebrae, which gives it protection. The olfactory lobes are located inside the nostrils of the fish and are connected to the brain by olfactory nerves. Although not shown in this illustration, the lateral line is a network of sensory canals that extend from the brain down the body to the tail and appear as a series of small openings aligned along the spinal cord. In each of these canals lies a sensitive receptor called a neuromast. These neuromasts provide the fish with important information about water movement which in turn allow the fish to detect moving prey or predators.

The heart is a muscular two-chambered organ (humans have four chambers) that is primarily responsible for circulating blood throughout the fish's body. The heart is situated at the base of the throat and lies in the pericardial cavity that is completely separated from the body cavity. In humans, the blood is pumped through the lungs, oxygenated and returned to the heart which in turn circulates the oxygen rich blood throughout the body. In trout, blood enters a chamber in the heart called the atrium and passes through a valve into the ventricle which forces the blood out and into the capillary networks of the gills. After the gas exchange in the gills, the oxygenated blood passes on to the capillary network throughout the body of the fish.

The stomach is a dilated, U-shaped section of the digestive tract located between the esophagus and the intestine. The fingerlike structures that extend from the stomach are called pyloric caeca. (pi-lorik see-ka) These caeca secrete the digestive enzymes required to digest some food. The digestive process begins in the stomach. The trout's stomach can easily extend to allow the fish to swallow large prey whole. The remainder of the digestion and food absorption processes take place in the intestine.

The liver acts as an accessory digestive organ. The liver secretes bile through a duct into the gall bladder. The liver also detoxifies heavy metals, drugs and pesticides to which the animal may be exposed.

The gall bladder is a small amber yellow to green sac attached to the liver. The gall bladder stores and discharges bile into the stomach. Bile aids in the digestion of fats.

The kidney lies along the ventral surface of the spine. The kidney is the main filter of the body and its primary function is to maintain the internal salt/water balance of the fish. In fish, the kidney plays only a minor role in the elimination of waste products like ammonia. In combination with the spleen, the kidney also produces white and red blood cells.

The spleen plays important parts in both the function of the red blood cells and the fishes' immune system. It removes old red blood cells, holds a blood reserve and recycles iron. The white blood cells of the spleen also synthesize antibodies.

The gas (swim) bladder is responsible for maintaining the fish's equilibrium in its environment. The fish does this by changing the amount of air in the bladder, raising and lowering its position in the water column.

The ovaries are the female trout's reproductive organs and produce eggs and sex hormones. A typical mature rainbow trout can produce from 1,000 to 8,000 eggs each season.

The skeleton of a trout gives structure, provides protection and anchors the muscles.

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