**Platyhelminthes Lab: Analysis**

**1. Q - A human tapeworm can be as long as 60 feet! How is this possible when the human intestine is only about 20 feet long?**
    A - Since the tapeworm is paper thin, it can *fold itself over many times*, allowing itself to only occupy a short section of intestine. By folding up, it also covers more of the intestinal tract, allowing it to absorb more nutrients. Benefit – surface area

**2. Q - What is the function of the hooks and suckers on the scolex?**
    A - Once the tapeworm is in the small intestine, it needs to *attach to the intestinal wall*. The hooks on top then grab into the wall, firmly attaching the worm to the intestine. Then, the suckers grab onto the wall, bringing the scolex close up against the side. NOTE: the suckers on the scolex are *not used to absorb nutrients*; this is instead done all along the body of the worm.

**3. Q - In what ways is Clonorchis (parasitic fluke) similar to Planaria (free living fresh water flatworm)? In what ways are they different?**
    A - *Since the Planaria (class turbellaria) is a free living worm, it has sensory organs such as its eye spots and auricle. Since the Clonorchis (class trematoda) is an endoparasite, it has none of these, as it does not have to search its environment for nutrients*. Both Clonorchis and Planaria have a visible mouth and gastrovascular cavity. However, the Planaria's *mouth is on its pharynx*, while Chlonorchis` is on the anterior of the worm`s body. Both worms have the flat, somewhat leaf shaped appearance, both in shape and the appearance of the gastrovascular cavity.

**4. Q - What do each of the germ layers develop into?**
    A - The ectoderm (outside) develops into *skin* and the nervous system of the worm. The mesoderm (middle) develops into all the *muscles* in the worm`s body, as well as its respective sexual organs. Endoderm (inside) develops into the *digestive system*, consisting of the mouth, gastrovascular cavity, and pharynx, of the worm.

**5. Q - In what ways are flatworms more advanced than Cnidarians?**
    A - *Flatworms are triploblastic*, meaning they have a mesoderm along with the ectoderm and endoderm. Cnidarians are diploblastic. The flatworms also have a completely different digestive system. *Instead of food entering and exiting through the same hole, flatworms are able to excrete SOME of their cellular waste (ammonia) through cells covering their body called flame cells – waste out through pores*. Their nervous system is arranged in a *nerve ladder instead of a net*, a more organized nervous system. Flatworms have *bilateral symmetry*, while Cnidarians *have radial symmetry*. Flatworms now have *cephalization*, beginning with a `brain` - ganglia - and sense organs that appear in the head of the worms, such as eye spots and auricles.

**6. Q - Name the characteristics of the phylum Platyhelminthes:**        A) Type of symmetry - Bilateral, can be divided into two equal halves along the lateral line
        B) Body plan - No real body cavity (acoelomate), triploblastic (3 body wall layers), non-segmented body
        C) Type of digestive system - Gastrovascular cavity (incomplete)
        D) Type of nervous system - Nerve ladder, with `brain` - ganglia - at one end. First sensory organs

**7. Q - Explain or define these terms:**
        A) Hermaphroditic - The animal has both female and male sex organs inside its body
        B) Ladder type nervous system - The nervous system of the worm is arranged like a ladder, with two lateral nerve cords with many branches in between the two main nerves
        C) Flame cells - Cells on the outside of the worms body that excrete the cellular waste (ammonia – like urine) and excess water
        D) Regeneration - In the worm`s body are stem cells. If the worm is cut in half, the worm continues to survive. It uses the stem cells to regrow any part of it that is missing from the other half. This eventually results in two fully grown worms.

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|  | Endoparasite – Taenia (Tapeworm) | Free living – Planaria |
| Body structure | Extremely long worm with *scolex* (head) holding hooks and suckers (attachment) no mouth | Shorter body, more leaf shaped. Have sensory organs on head, mouth on pharynx in body |
| Eyes | No eyes; parasitic | Eye spots, as well as auricles situated in head in anterior of worm |
| Nervous system | Little to no nervous system, as it is parasitic | Nerve ladder leading up to sensory organs and "brain" in the head of the worm (ganglia), eyespots (made of ocelli) |
| Digestive system | Absorbs nutrients through skin all along body | Gastrovascular cavity. Consumes food with mouth on end of pharynx |
| Reproductive system | Each section of body (*proglottids*) contains sex organs. These release eggs and sperm. They can also regrow into multiple worms if cut in two or more pieces | Sexual - Testes located at back of body, ovaries in middle. Releases sperm and eggs to reproduce 'Penis fencing'Asexual - Fission – splitting in half and regenerating |