Culturing *Planaria*

Live Material Care Guide

Background

Planaria are found under rocks and logs in many bodies of fresh water. Although they are very simple organisms, they have the astonishing ability to regenerate body parts. *Planaria* are commonly used for regeneration experiments in the laboratory.

Planaria are flat-bodied worms, typically 1–6 mm in length. Their systems consist of a simple digestive system, nervous system with a cerebral ganglia (a simple "brain"), and eyespots (ocelli) on the top of their heads. These eyespots appear to be two large, crossed eyes making the *Planaria* look more intimidating to potential predators. The black dot seen within the eyespot is the photoreceptor that senses light. The *Planaria* then moves away from the light (negative phototaxic). *Planaria* reproduce both sexually and asexually by basically splitting in half and regenerating all body parts that were lost during the division. *Planaria* are also particularly responsive to stimuli. They are capable of successfully navigating a maze with multiple choices.

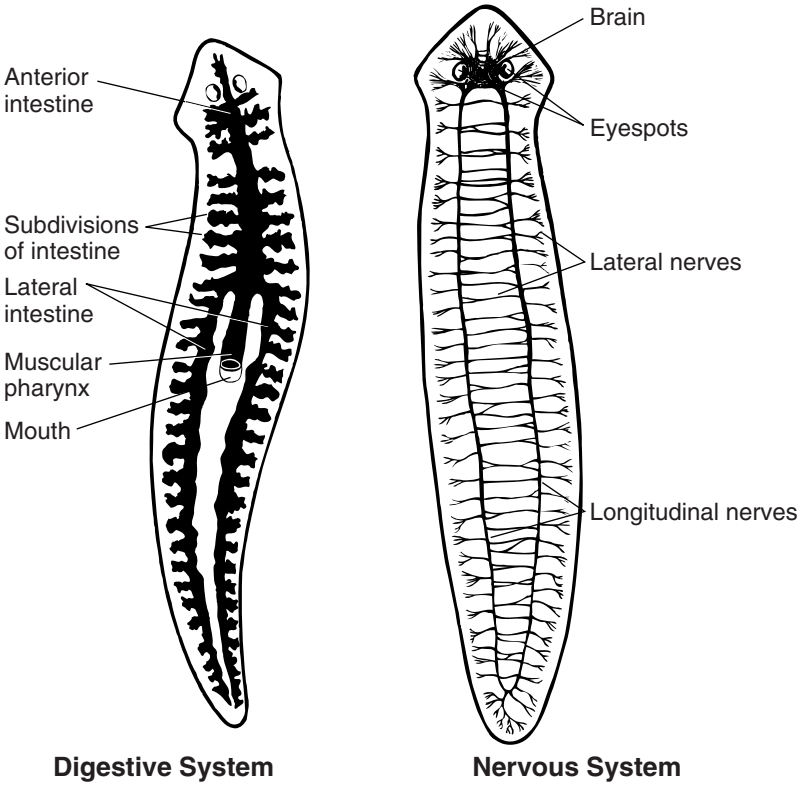

Figure 1. *Planaria*

Culturing/Media

Planaria thrive best in large jars or culture dishes containing filtered and boiled pond water or spring water (do not use tap or distilled water!) and a gravel bed. Add a couple of leaves or plants to the culture, and then introduce the *Planaria*. The cultures should be aerated by forcing air very gently into the water using a clean pipet or in a large culture with an aquarium pump without an airstone.

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Cultures should be placed out of direct sunlight—a dimly lit area is okay. In the dark is best. They are negative phototaxic. Maintain *Planaria* cultures at room temperature (20–22 °C). *Planaria* are exceptionally sensitive creatures. Even minor changes in the culture environment (pH, temperature, light) may result in mortality of the organisms.

Feed *Planaria* once every other day with small pieces of raw liver or hard-boiled egg yoke. Supply only as much food as can be consumed in approximately 30 minutes and remove any uneaten food to avoid bacterial blooms in the water, which can be deadly to *Planaria*. Do a water change within a couple of hours of feeding.

Planaria excrete a slime-like substance, which needs to be removed regularly from the water with a fine mesh aquarium net to prevent fouling of the water. Change 50–75% of the water every other day.

If regeneration experiments are to be conducted, use brown *Planaria* as they are more durable and able to withstand stress much better. Follow these procedures for best results:

1. Place the worm on a cold, glass, microscope slide or an ice cube under a dissecting scope. Doing so causes the worm to slow down and extend itself for easier cutting.
2. While observing through the microscope, make cuts using a single edge razor blade or very sharp scalpel. Ensure that the cuts make complete separate pieces, otherwise, the pieces will grow back together.
3. After making the cuts, place individual pieces in separate culture dishes partially filled with spring or pond water.
4. Cover the dishes to reduce evaporation, keep them in a cool place (not the refrigerator) and under low light.
5. Observe daily and describe and/or make diagrams of what takes place. It may take 2–3 weeks to fully regenerate body parts.

Tips

- The single most important factor in maintaining a healthy *Planaria* culture is sustaining clean water. *Planaria* will not survive in polluted waters in the environment, or in culture water. Regularly changing the water will help ensure long-term survival of *Planaria* cultures.
- Black *Planaria* are primarily used to compare behavior, i.e., competition for food, movements, etc., between species—Black vs. Brown.
- Allow students to study prepared slides of *Planaria* to view the internal structures more easily.

Disposal

Planaria cultures can be disposed of according to Flinn Suggested Biological Waste Disposal Method Type IV. Never release live *Planaria* into the wild. They may harbor parasites that would harm the ecosystem. Please consult your current *Flinn Scientific Catalog/Reference Manual* for proper disposal procedures.

Materials for *Culturing Planaria* are available from Flinn Scientific Inc.

Catalog No.	Description
LM1094	Brown Planaria
LM1096	Black Planaria
LM1098	Mixed Planaria
FB0107	Planaria Regeneration Kit
AB1265	Culture Dish, 1800-mL
FB0261	Aquarium Gravel
AP2253	Wide-Stem Pipets

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.