**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Partner: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**The Effect of 2 Different Chemicals on Daphnia Heart Rate**

**Objective: i)** To determine how Redbull affects the heart rate of Daphnia.

ii) To determine how ethanol affects the heart rate of Daphnia

**Materials:**

* Daphnia \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( genus and **species** name)
* Depression slides
* 10 % -- 20 % -- 30 % v/v aqueous solns of Redbull
* 5 % v/v ethanol Chemical formula = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

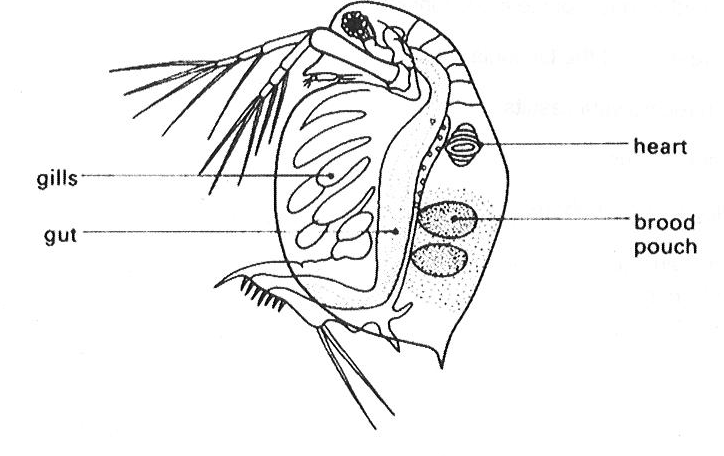
Structural formula =

* Lens paper
* Stereoscopes or Light microscopes
* Stopwatch

**Procedure**

1. Obtain a depression slide with a Daphnia in water.
2. Let the Daphnia rest for one minute.
3. Using a lens paper, remove most of the water from the slide so the Daphnia does not have too much room to move around.
4. Place the slide under stereoscope or microscope. **DO NOT TURN ON THE MICROSCOPE UNTIL YOU ARE READY.** Otherwise the Daphnia will cook!
5. Turn on the microscope and observe the animal under LOW POWER.

The beating heart is located on the dorsal side just above the gut and in front of the brood pouch (see diagram). Make sure that you are counting the heart beats, and not the flapping of the gills or movements of the gut. The heart must be observed with transmitted light if it is to be properly visible.



1. Count the number of heartbeats in 20.0s -- make dots on a paper to help you keep track as per the Carolina Biologicals Video.
2. Repeat steps 1-6 for Daphnia in 10 %, 20 %, and 30 % Redbull and 5 % alcohol solutions.

**Data**

|  |  |  |
| --- | --- | --- |
| **Solutions** | **Heart Rate (for 20s)** | **Heart Rate (beats/min)** |
| 10 % Redbull |  |  |
| 20 % Redbull |  |  |
| 30 % Redbull |  |  |
| 5 % Alcohol |  |  |

**Questions**

**1.** What are the variables in this lab?

|  |  |  |
| --- | --- | --- |
| **Variables** | **Redbull** | **Alcohol** |
| **Independent** |  |  |
| **Dependent** |  |  |
| **Controlled** |  |  |

**2.** Graph the data.

**3.** What was the reason you did STEP 6?

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**4.** How was the heart rate affected by the Red Bull?

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Why?

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**5.** How was the heart rate affected by the alcohol?

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| --- |
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|  |

Why?

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|  |

**6.** Compare the heart rate of your Daphnia before the experiment with the heart rate from the other Daphnia in your lab.

How much variability is there among trials for individual water fleas?

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**7.** Why is it necessary to repeat the experiment on several individuals, rather than repeating it on the same individual again and again?

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**8.** What about Daphnia make it so easy to experiment on for a scientist?

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**9.** Why are Daphnia such a great food source for fish?

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**10.** Where are Daphnia’s natural habitat?

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**11.** Why is Daphnia magna the most used source of Daphnia?

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