

## **Virtual Lab: Population Biology Post-Lab Quiz and Lab Report**

1. Please make sure you have read through all of the information in the “Question” and “Information” areas. If you come upon terms that are unfamiliar to you, please refer to your textbook for further explanation or search the word here: <http://encarta.msn.com/encnet/features/dictionary/dictionaryhome.aspx>
2. In this exercise, you will examine the characteristics of population growth and the effects of competition using two model organisms. To begin, read the text that appears in the “Information” window that initially opens in order to learn about the aquatic protist *Paramecium*, growth of populations and the facets of competition. You can close this window by clicking the “X”; remember you can reopen the file by clicking the “Information” button at the bottom of the laboratory page.
3. You are now ready to begin the activity. Start by clicking on the purple pipette bulb on the far left. Once filled, click and drag the pipette to the test tube on the far left of the test tube rack in order to fill it with the first protist culture. Then click on the bulb on the right and repeat the steps to fill the second test tube with the next culture. To fill the last test tube, click and drag a sample of EACH protist culture to the test tube on the far right of the test tube rack.
4. You will next need to click on the microscope icon in the laboratory area. This will open up your workspace for observing the cultures. To make your wetmount preparations, click the box of clean slides and then the rack of cultures. You can then click each individual slide and drag it to the microscope in order to count the organisms in each culture. Remember to click the “Grid On” icon on the microscope to aid you in your counting. When you are through counting the cultures, place your data in the “Data Table” and/or Table I below. Remember to multiply your counts by 2 to indicate the number of organisms present in 1mL of culture. When you are finished, click “Clear Slides” and then click the calendar to advance 2 days of growth.  
NOTE: there is a “Diagram” button here to show you detailed structures of *Paramecium* sp.
5. You are now ready to repeat the actions in step 4. Continue to do so until you have counted your cultures for 16 days and the “Data Table” and/or Table I are complete. When you are finished with the “Data Table”, click the “Graph” button to obtain a graph of your data over the 16 days.
6. Please finish this exercise by opening the “Journal” link at the bottom of the page and answering the questions.

Table I:

Day	<i>P. caudatum</i> alone, cells/mL	<i>P. aurelia</i> alone, cells/mL	<i>P. caudatum</i> mixed, cells/mL	<i>P. aurelia</i> mixed, cells/mL
0				
2				
4				
6				
8				
10				
12				
14				
16				

## Post-laboratory Questions:

- Paramecia possess:
  - A nucleus
  - Flagella
  - A contractile vacuole
  - A and C
  - All of the above
- The organisms used in this experiment belong to which domain of life?
  - Bacteria
  - Archaea
  - Eukarya
- What served as the food for the paramecia in this experiment?
  - Rice
  - Oats
  - Bacteria
  - Nothing, they are photosynthetic
- Which of the following can influence the carrying capacity of a population?
  - Availability of food
  - Availability of water
  - Competition
  - Build up of toxins
  - All of the above
- Which type of competition would be observed between organisms within the *P. caudatum* culture?
  - Interspecific
  - Intraspecific
  - There would be no competition, they are of the same species
- Which culture reached its carrying capacity the fastest in this experiment?
  - P. caudatum*, alone
  - P. aurelia*, alone
  - P. aurelia*, mixed
- You have counted 30 organisms in your culture on Day 4. The concentration of organisms in this culture is:
  - 15 cells/mL
  - 30 cells/mL
  - 60 cells/mL
  - 90 cells/mL
- Based upon your data, which culture experienced the greatest rate of exponential growth?
  - P. caudatum*, alone
  - P. aurelia*, alone
  - P. caudatum*, mixed
  - P. aurelia*, alone
- Based upon the data, which organism appeared more efficient at using its resources?
  - P. caudatum*
  - P. aurelia*
- In a repeat of this experiment, you found that on Days 10-16 the number of individuals in the *P. caudatum*, mixed culture began to gradually rise. A possible explanation for this is:
  - There was insufficient food in the culture
  - The temperature warmed enough to allow for more growth
  - A genetic variant of the original population began to experience growth due to its use of a different food (bacterium) source
  - None of the above could lead to this scenario