Lab Report on Plant Growth

At the beginning of the semester, your instructors set up an experiment to determine whether two hormones, auxin and cytokinin, affect the growth of lettuce seedlings. There were 24 tubes of sterile, semi-solid media that served as a source of water and minerals. Additionally, 18 of the tubes contained one or two hormones as indicated below. Lettuce seeds were sterilized by brief immersion in alcohol, then were allowed to germinate under sterile conditions. The emerging root and shoot tip was cut off from each of 48 seedlings leaving only the cotyledons and a tiny piece of stem. Two seedlings were placed in each tube. The tubes were covered to prevent contamination and all tubes were kept under plant growth lights for four weeks. Sterile conditions were used because fungi and bacteria would otherwise grow on the media within the tubes. The tube caps were loose enough for gas exchange to occur.

- Six tubes had no added hormones (white cap).
- Six tubes contained the plant hormone auxin (red cap)
- Six tubes contained the plant hormone cytokinin (blue cap)
- Six tubes contained both auxin and cytokinin (yellow cap)

 NOTE: It was difficult to remove the apical tips of shoots when setting up the experiment. It is likely that the remaining shoots of seedlings contained small amounts of auxin.

Each table in the lab had one tube of each color. For your results, present the data collected by your group of 4 (you uploaded this to WebAssign for assignment 6). In your discussion, give an explanation for the results obtained by your group. Then compare your group's results with that of the class as a whole (which includes measurements from all 24 tubes). Indicate which data set (yours or the class data) is more accurate and why. We did not calculate standard errors for the class data, but as an approximation, assume that two numbers are significantly different if they differ by more than 10%.

Data for the entire class was as follows:

Leaf length (cm)

- White tube = 3.2
- Yellow tube = 5.7
- Red tube = 3.3
- Blue tube = 7.8

Root length (cm)

- White tube = 2.3
- Yellow tube = 2.1
Red tube = 1.6
Blue tube = 3.5

Number of roots: In five groups, blue had the most roots. In one group, red had the most roots.

The format of your report should be as indicated in the LabWrite website.

Thus, you should have in this order:
title
abstract
introduction
methods
results
discussion (ending with a conclusion)
references

Your introduction can be brief, but should include information about auxins and cytokinins and a **hypothesis** regarding the experiment. You will need information on these hormones from articles that you have located in a text book or on the Internet. Your methods section should include how the experiment was setup (in your own words) as well as how you performed measurements and recorded the data. Be sure to mention "control" and "experimental" conditions. For the results, put your data and the class data in separate tables. You decide the best way to make the tables based on information in LabWrite. Be sure to use hormone names (not cap colors) in your tables. You will also need pictures of the lettuce plants at the beginning and end of the experiment. At the beginning of the experiment, the seedlings in all tubes looked the same. Use this image:
You should have pictures of plants in the 4 tubes at the end of the experiment that you captured using the Flex camera. These pictures should be in the section folder on your lab computer. You can get them next week during your scheduled lab period. The pictures should be called figures in your report and need figure numbers and a descriptive title. Be sure to refer to them in the results and discussion sections of your report.

For the discussion, read the section on chemical signals during plant development in this week's laboratory assignment and find at least 3 references from text books or on the Internet that help explain the effects of auxin and cytokinin on leaf and root growth in this experiment (one reference only can be Wikipedia). HINT: pay special attention to effects on plant growth when auxin and cytokinin are both present. List the references in your bibliography (references section) using the format in LabWrite. When referring to these references in your introduction and/or discussion, put the author's name(s) and date in parentheses in the sentence referring to the article. Be sure to end your discussion with a conclusion based on your hypothesis.

If you have never written report like this, be sure to study the information in the LabWrite website before beginning. You may collaborate with other students while working on your report, but it must be written in your own words.

The lab report is worth 14 points and must be submitted to WebAssign before midnight, November 28. Upload your report as a .doc or .pdf file, and be sure that embedded images are in jpg format.