**Practical investigation into phototropism STUDENT**

**Introduction**

Plants exhibit positive phototropism towards light. The plant hormone auxin is found in the tip of plant shoots and is involved in cell elongation. Gibberellins are also involved in cell division and elongation as well as seed germination. In this activity you will design an experiment to investigate the chemical basis of phototropism in young plants.

**Aim**

To investigate the chemical basis of phototropism in young plants.

**Intended class time**

* 1 session to set up your investigation followed up by taking measurements over the next few days/weeks

**Chemicals**

|  |  |
| --- | --- |
| IAA solution | Low hazard |
| Gibberellin solution | Low hazard |
| Agar cubes | Low hazard |

**Equipment (per group)**

* Small seedlings (maize coleoptiles)
* Bench lamp
* IAA (indole-3-acetic acid also known as auxin)
* Gibberellin (gibberellic acid)
* Agar cubes
* Foil
* Potting compost
* Scalpel
* Marker Pen
* Tape
* Water

**Health and Safety**

Be careful when using the scalpel.

**Procedure**

*Note: You can cut the tip off a coleoptile and replace it.*

1. Working individually or in small groups, design a method using the materials available to investigate the chemical basis of phototropism in young plants. You will need to consider the use of controls, the number of different coleoptiles you will use and the number of repeats for each set up you design.
2. Decide the variables you will control and which variable(s) you will vary.
3. Carry out your investigation using the apparatus available and record your data appropriately. You will need to take readings over a number of days/weeks. Each student in a group should take turns to set up the coleoptiles, take measurements and record readings.
4. Process and present your data appropriately.
5. Finally, evaluate the results and draw a conclusion from your data.

**Extension questions**

1. If phototropism is the response to light, what is geotropism and how can this be positive and negative?
2. You were told that auxin is involved in cell elongation and that gibberellin is involved in cell division and elongation, as well as seed germination. Did the results of your investigation agree with this?
3. Have you identified any limitations in the procedure you followed? What could be improved if you were to repeat the experiment?

**To submit**

For this piece of work to count towards Practical Activity Group 11 of the GCE Biology Practical Endorsement, you need to have a record of the procedure you designed as well as evidence of the data you collected. You should have analysed the data collected and drawn a conclusion about the effect of the plant hormone(s). Answering the extension questions will aid you in preparation for your written examinations.