Sexual and Asexual Reproduction and Cloning of Plants

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Objectives

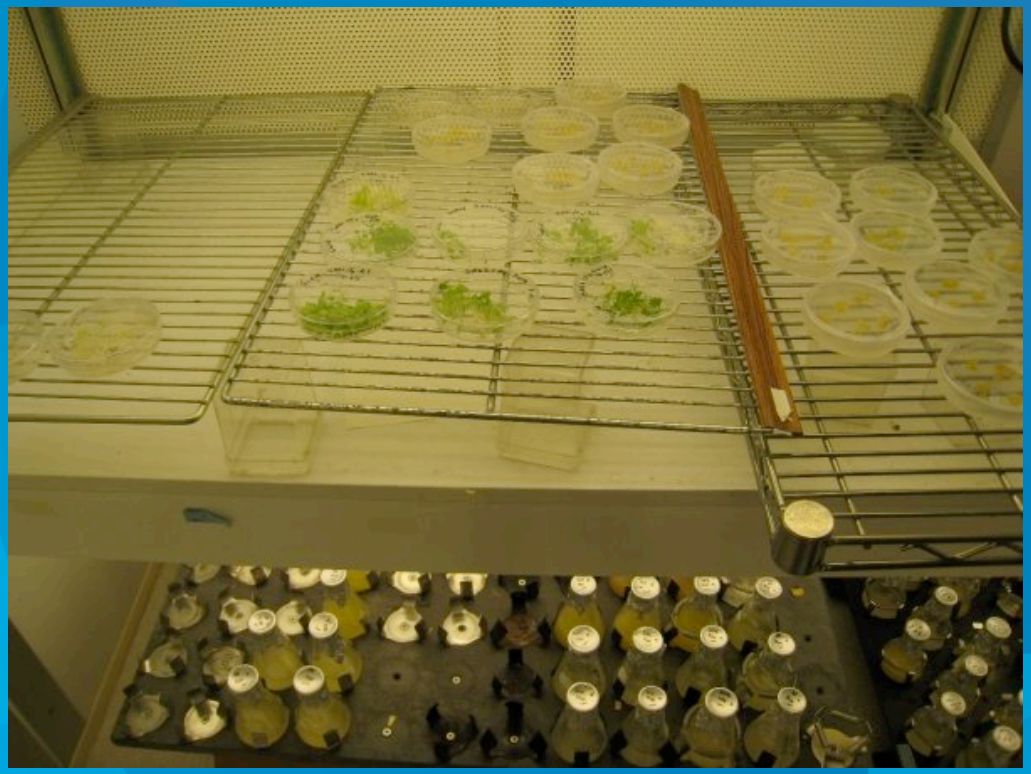
For our plant cloning project, we focused on learning the techniques of plant cloning.

We also focused on studying the regulation of development in plants by plant hormones, specifically the use of auxins and cytokinins.

Background Information

There are two types of reproduction, sexual and asexual.

Some of the plants that were cloned.



Materials

- Plant tissue culture medium
- Plant materials- leaves and roots
- Sterile Petri Dishes
- Forceps and scalpels
- Saran Wrap
- Laminar flow hoods

(laminar hood)

Sexual Reproduction

Sexual reproduction is when two cellular events reduces the number of the chromosomes to half of that in a typical body cell. This is called somatic cells. The two cellular events are known as meiosis and fertilization.

Meiosis is what divides the chromosomes up and fertilization is what restores it back to its normal number of chromosomes. The chromosomes are capable of being restored with the help of fusion of gametes.

Gametes are cells that fuses with each other to reproduce sexually.

Asexual Reproduction

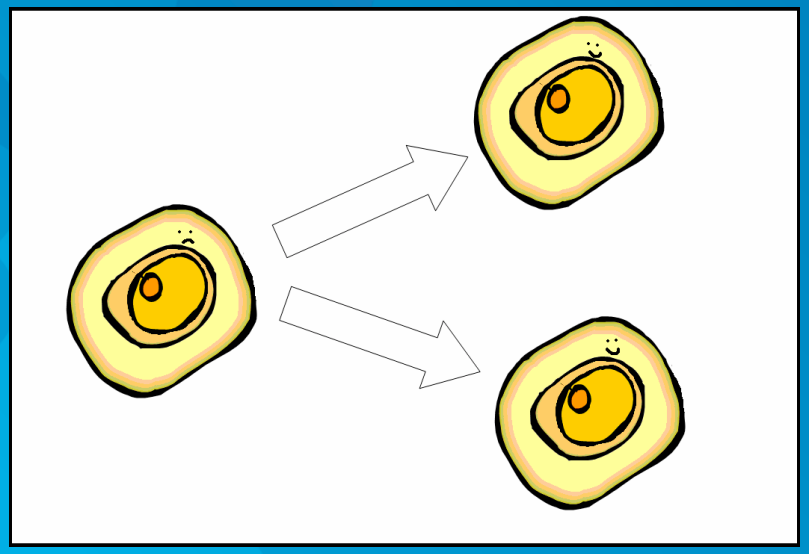
Asexual reproduction can also be called cloning.

An organism is developed directly from somatic cells. This process does not include meiosis or fertilization.

An individual receives the chromosomes to itself from a single organism. This causes it to be identical to the organism, in this case a plant.

Cloning

- A clone is an exact genetic copy of an organism.
- Plants :Take a cell → replicate cell.

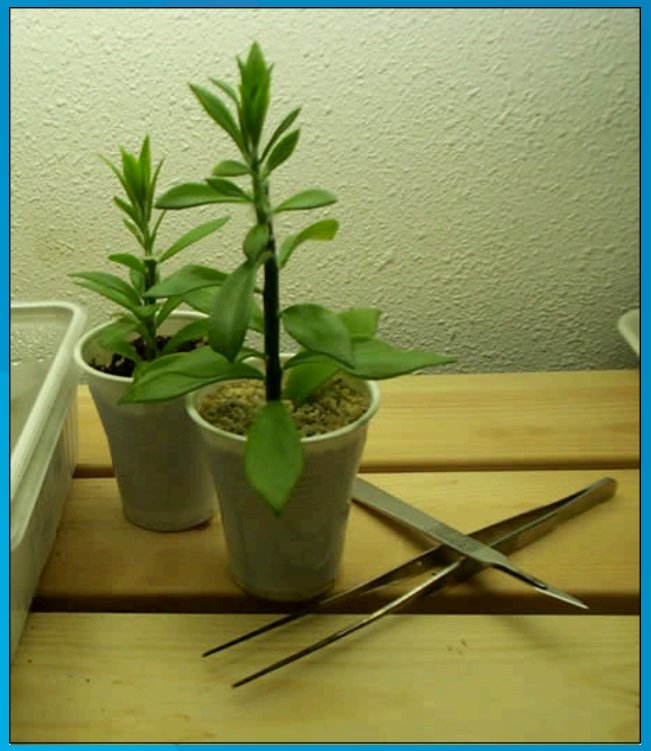


Plant cloning

- Much easier than cloning animal cells.
- Can clone from a single cell

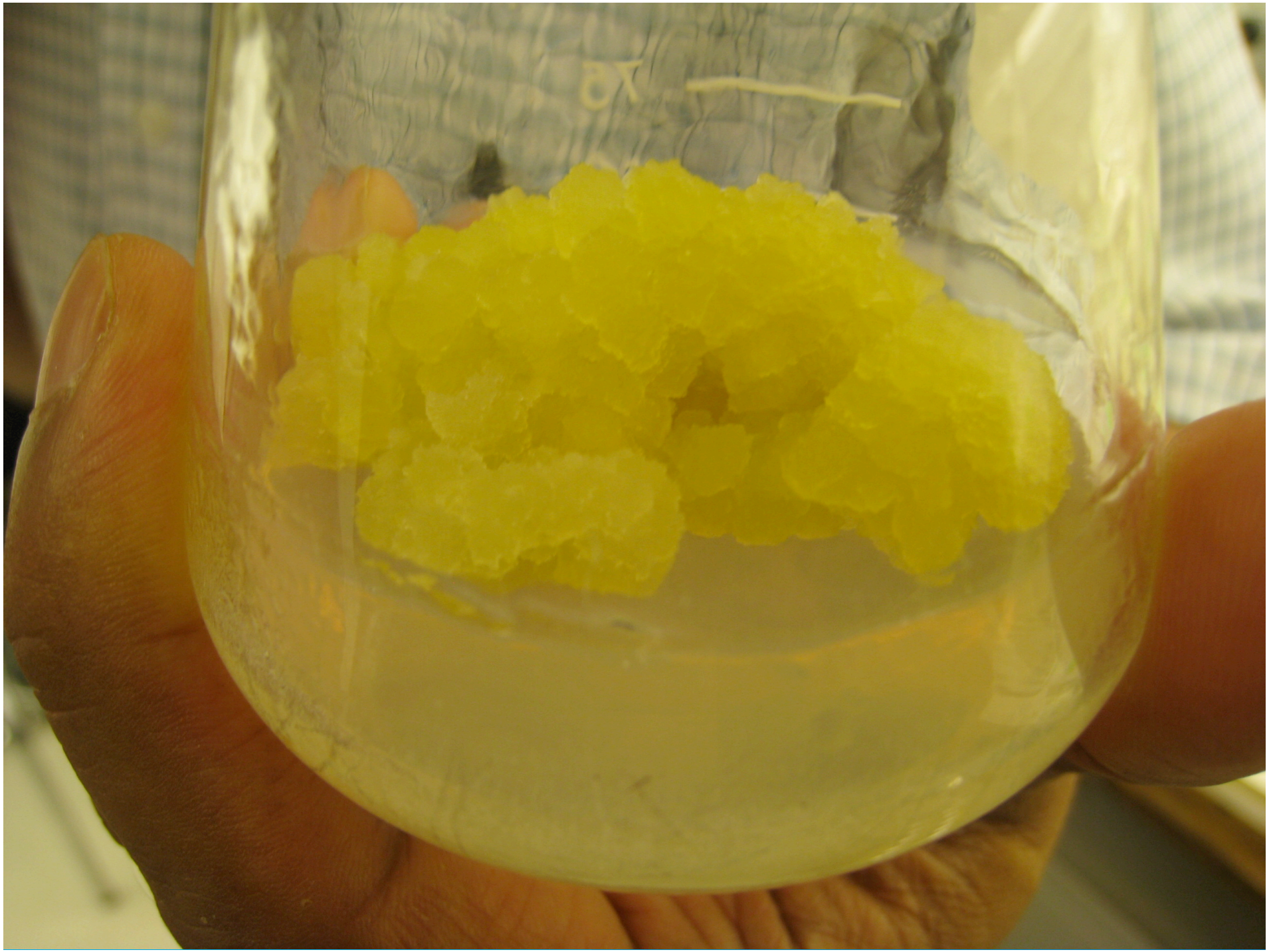
Step 1 - Take a plant sample

- Remove a plant sample.



Step 2 - Place that sample onto an agar plate

- This plate has...
  - Nutrients necessary for growth
  - Hormones (If desired)
    - Auxins – Roots
    - Cytokinins - Shoots

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Step 3 – Give sunlight and wait.

- Plants need sunlight for photosynthesis.
- Agar plate provides the rest.

In the lab we...

- We cloned our own plants.
  - Varying amounts of cytokinins and auxins were used to produce plants with either a lot of shoots or roots.
- They were stored inside a controlled enviroment.

Results

- Depending on how we did, the results may vary.
  - If we had successfully cloned the plants, then the plant would grow roots and leaves attached to each other as an actual plant.
  - If we had not, then the plants would grow tumors or would not grow altogether.

For the future...

- In the future, we hope to...
  - Continue to finish our project on plant cloning. We would like to see what the plants we cloned look like. We have an idea of what it looks like, but because of time constraints, we were only able to observe a week of growth (very little).

References

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