Plant Tissue and Cell Culture

Using Biotechnology for Plant Research

Plant tissue and cell culture is a process that involves cloning plants/plant cells from individual cells, organs or tissue in a nutrient medium under sterile conditions.

Scientists use this technique extensively to create exact genetic copies of a plant (clones) or generate large quantities of clone cells/organelles for further research.

The use of tissue and cell culture has resulted in dramatic advances in plant science and forms an essential component of scientific research on plants.

An example of use of plant tissue culture in the lab:

Step 1) Scientist use **transformation** techniques to introduce a new gene of interest into tissue of a plant. Thus altering its **genotype**.

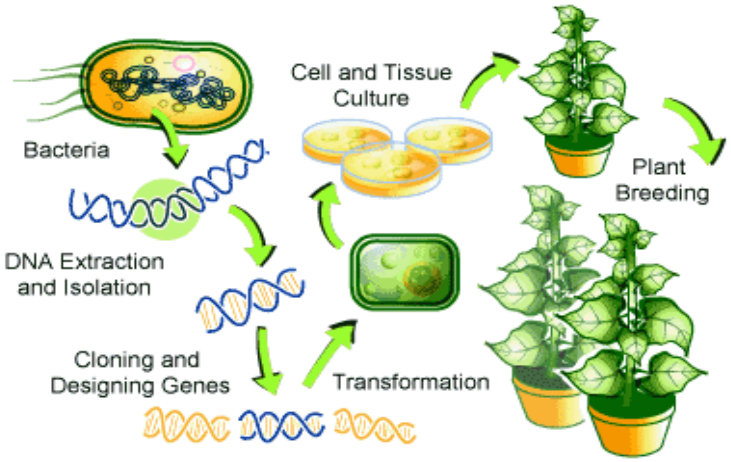
Step 2) The transformed plant cells are then isolated and placed into sterile nutrient agar.

Step 3) Each cell grows into a cluster of cells called a **callus** which are essentially unspecialised cells that haven't decided what to be when they grow up!

Step 4) Calluses are seperated and a plant hormone called cytokinin is added which stimulates growth of small leaf shoots.

Step 5) Shoots are seperated and the addition of another plant hormone called auxin stimulates the growth of roots.

Step 6) New plants are transferred to soil and grown to observe how the alteration of its genotype has affected its phenotype under extreme environmental conditions such as high salt, increased CO_2, and drought.



For information on how to introduce plant tissue culture into your classroom go to:
Biotechnology Online at www.biotechnology.gov.au

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