

UNIT-5

PLANT TISSUE CULTURE

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Callus

- It is an **unspecialized** , **unorganized**, **growing** and **dividing mass** of cells.
- It produced when explants are cultured on the appropriate solid medium, with both an **auxin** and a **cytokinin** in a correct conditions. **2,4-D** are commonly used.
- During callus formation there is some degree of **dedifferentiation** both in morphology and metabolism, resulting in the lose the ability to photosynthesis.





WASH CARROT ROOT TIP



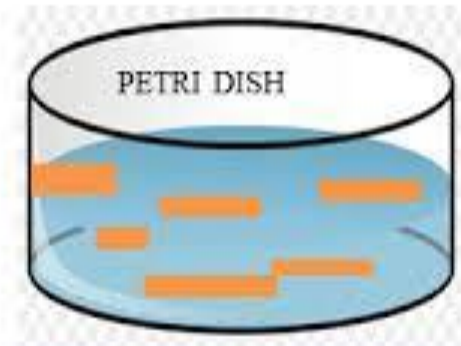
BREAK IT IN TO 3-4 PIECES



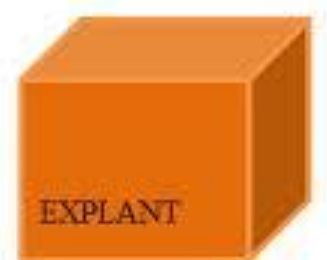
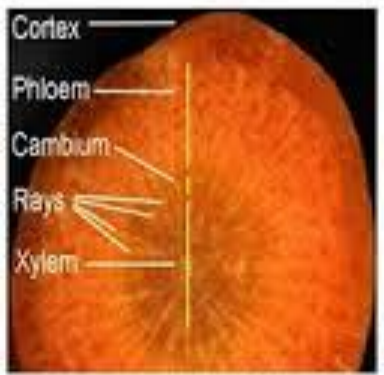
CUT THE CORE AND RINSE IT IN TO WATER



BALANCING THE PH BY ADDING SOD.HYDROCHLORITE SOLN



PLACE DISKS INTO CALLUS INITIATION MEDIUM



TRANSFER OF EXPLANT USING FORCEPS ONTO THE SURFACE OF THE AGARIFIED NUTRIENT MEDIUM



CULTURE MEDIUM INCUBATED OF 25°C FOR 2-4 DAYS



CALLUS IS FORMED

PROTOPLAST

- Protoplast is a plant, bacterial or fungal cell that had its cell wall completely or partially removed using either mechanical or enzymatic means.

Protoplast = cell- cell wall

- Protoplast are plant cell with the plasma membrane but without the cell wall. Protoplast allow the fusion of similar or different species and the fused product can generate into the whole plant.

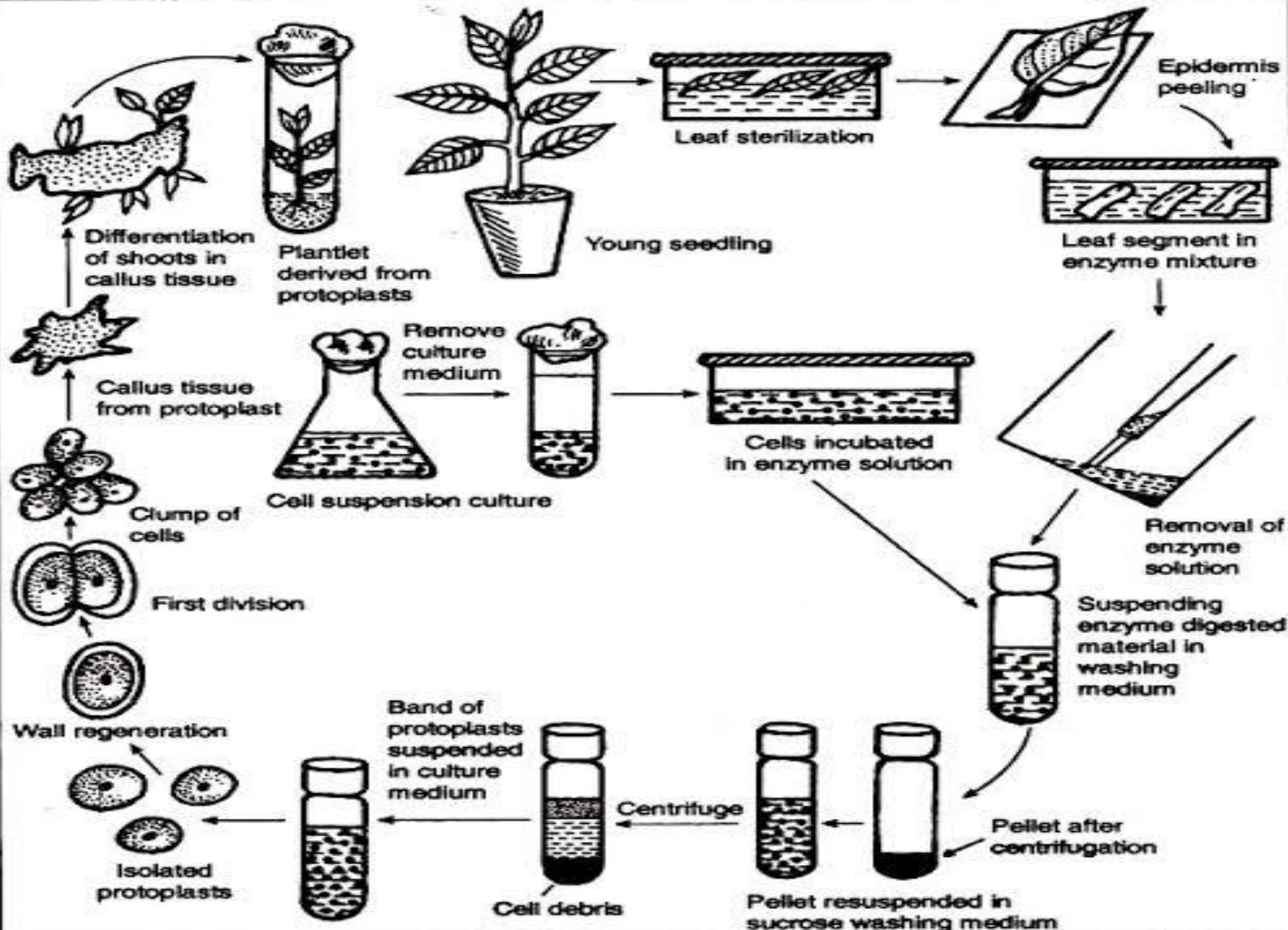
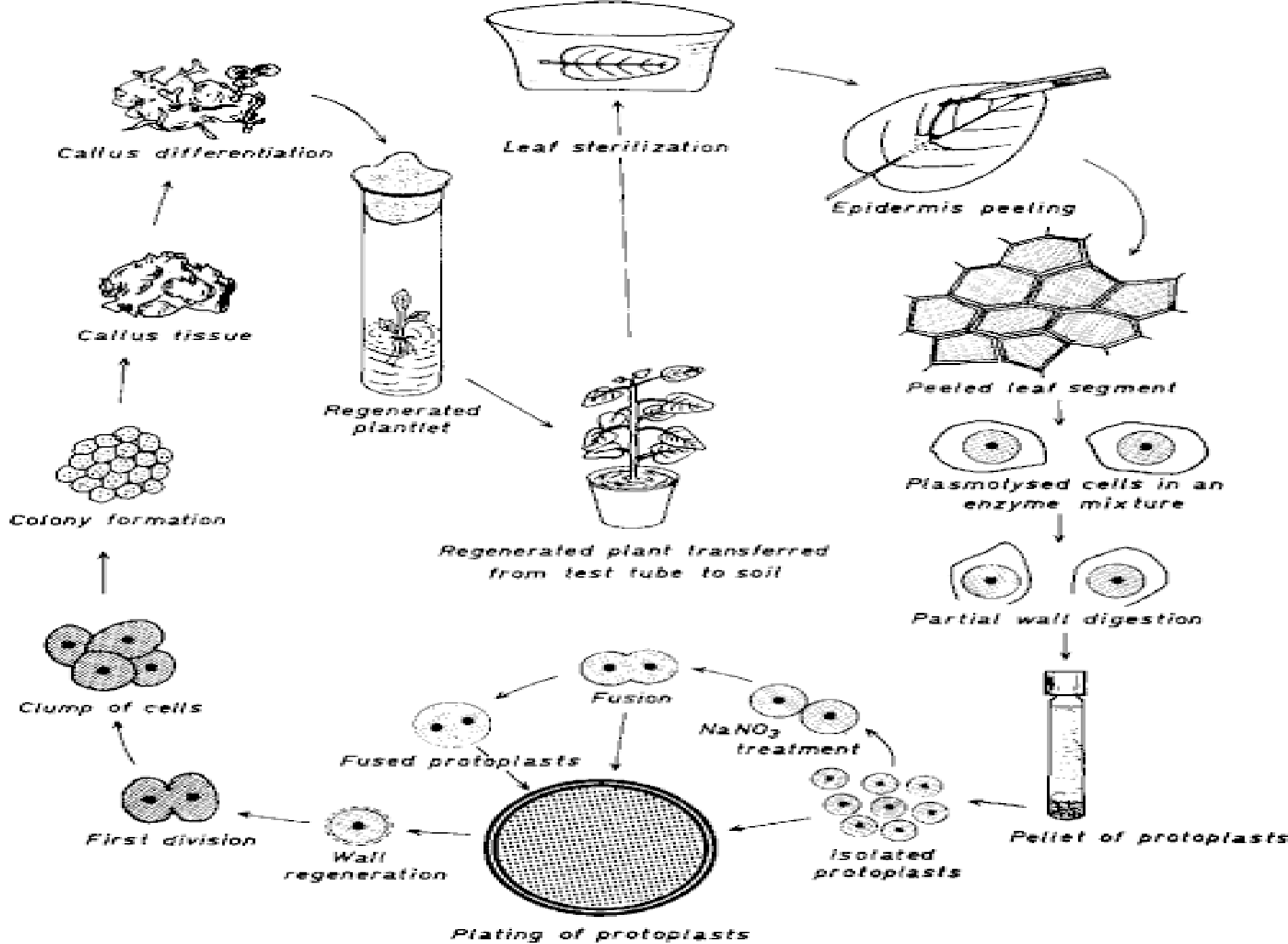


Fig. 20.3: Steps involved in protoplast isolation, culture and regeneration



Importance of Protoplast Culture

- Study of Osmotic behavior
- Study of IAA action
- Study of Plasmalemma
- Study of Cell wall formation
- Organelle isolation
- Study of Morphogenesis
- Virus uptake and replication
- Study of photosynthesis
- Gene Transfer



Natural seeds

1. Hard seed coat present.
2. Embryos are much protected within cotyledons or endosperm.
3. Embryos undergo controlled desiccation by the maternal tissue and have a natural dormancy period.
4. The natural seeds have their own storage reserves like endosperm or cotyledons to provide food during germination.

Synthetic seeds

- No seed coat, only encapsulated.
- Embryos are not protected within any kind of maternal tissue.
- Embryos do not pass through any kind of desiccation and they do not have any dormancy period.
- The artificial seeds do not have their own storage tissue, the nutrients or growth regulators can be supplied within the encapsulating material.

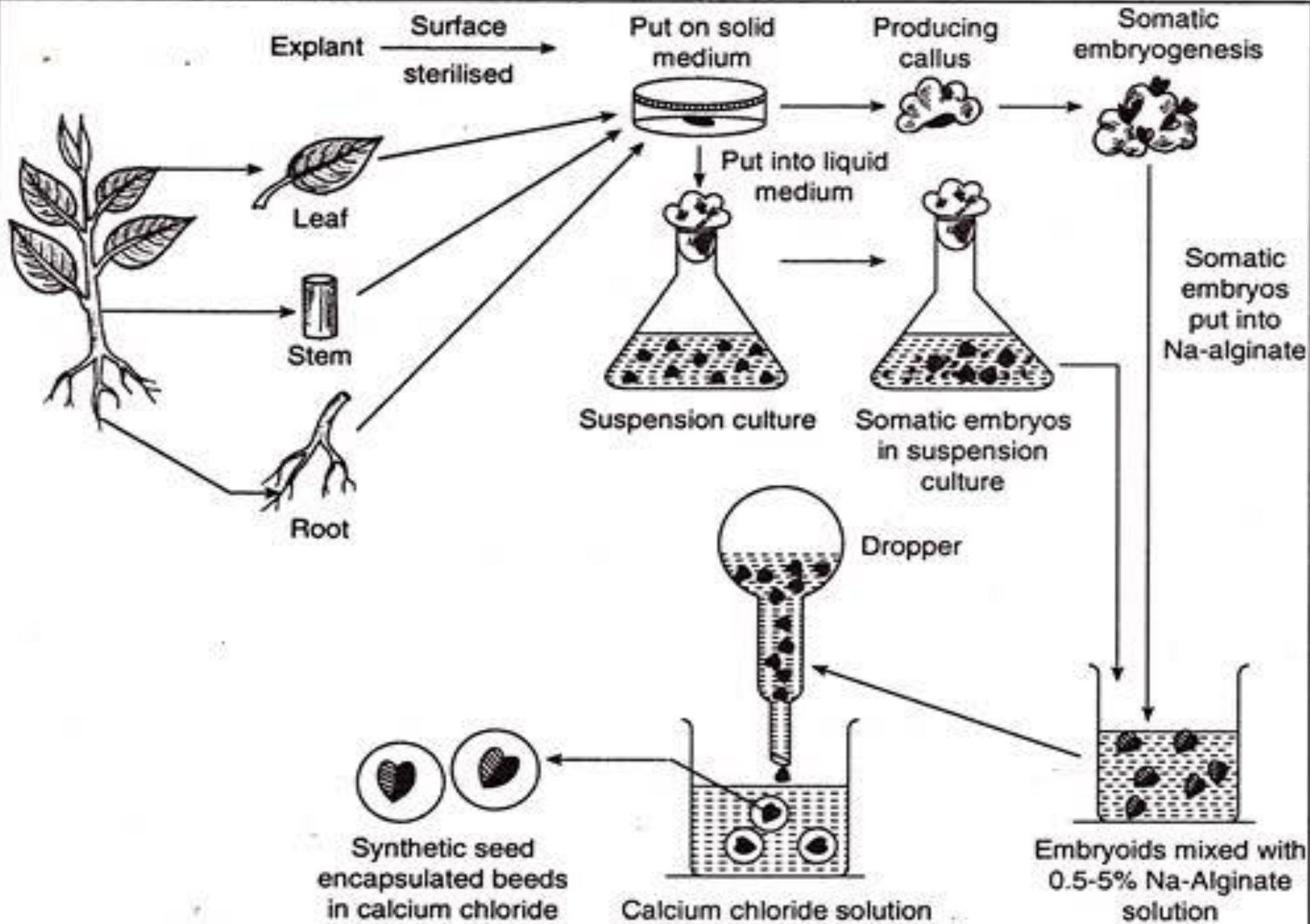
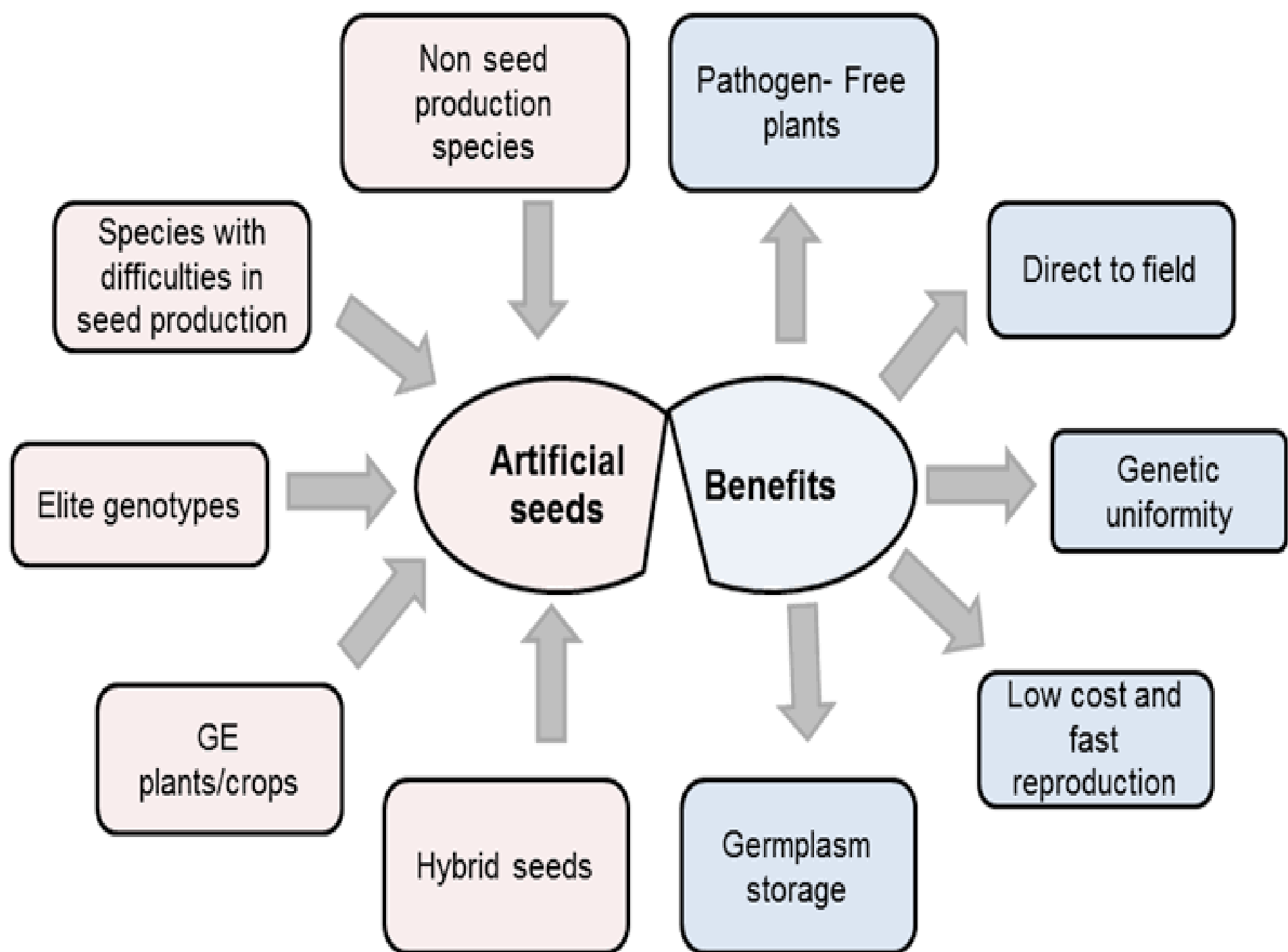
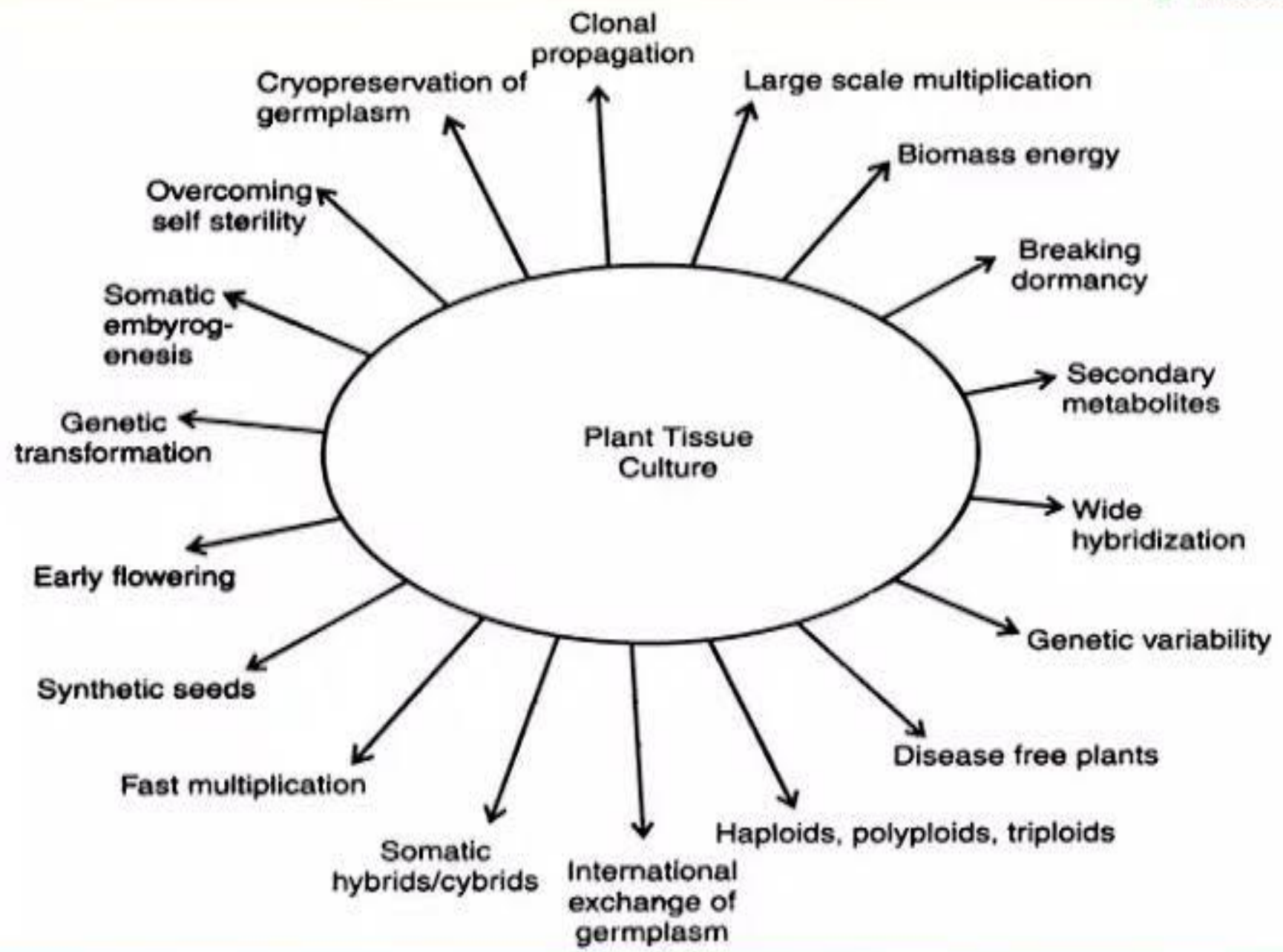


Fig. 18.7: Steps for Synthetic or Artificial seed production





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THANK YOU

