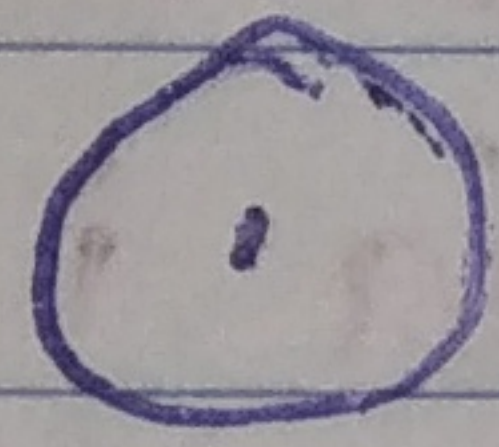


Somatic Embryogenesis

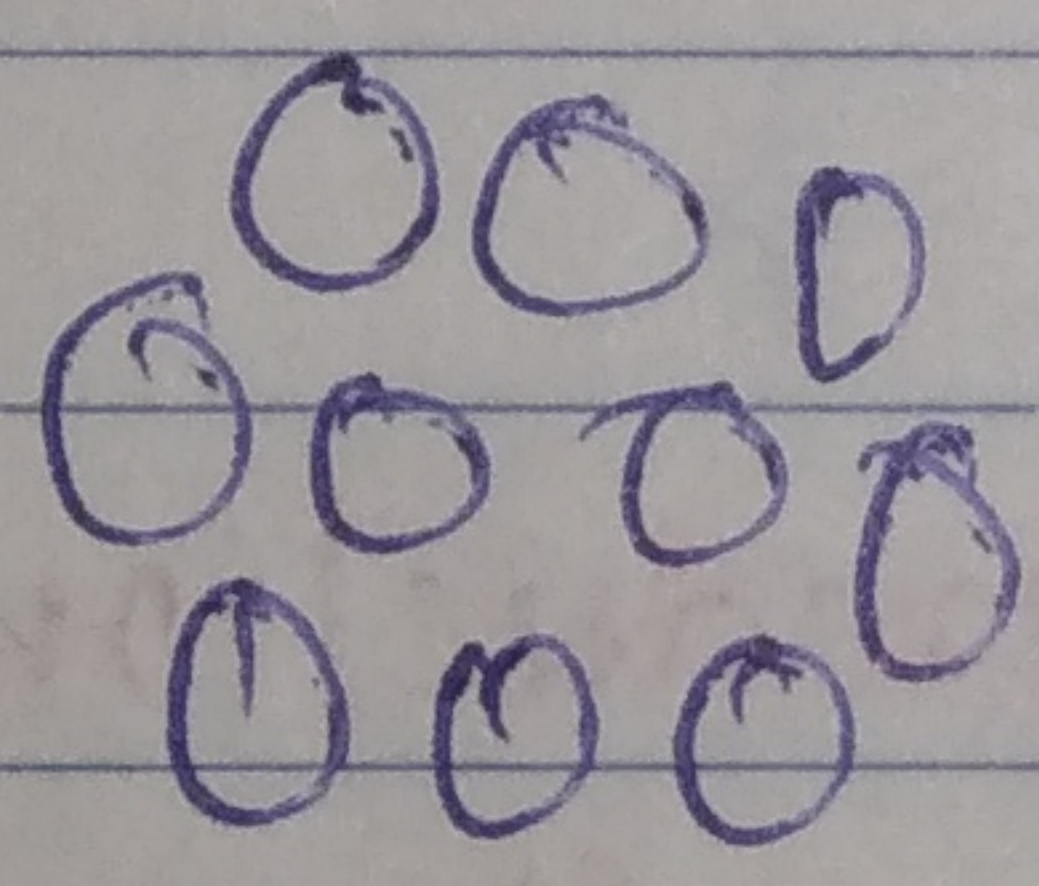
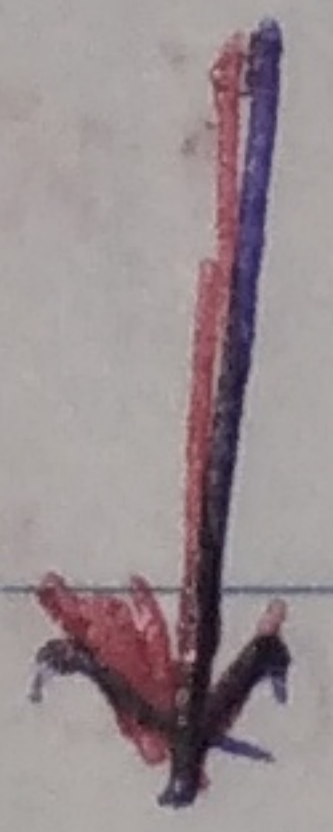
It is the process where somatic cell or tissue develop into differentiated embryo. These somatic embryo can develop into whole plants without undergoing the process of sexual fertilization as done by zygotic embryo.

Somatic embryogenesis can be initiated either directly from explant or callus.

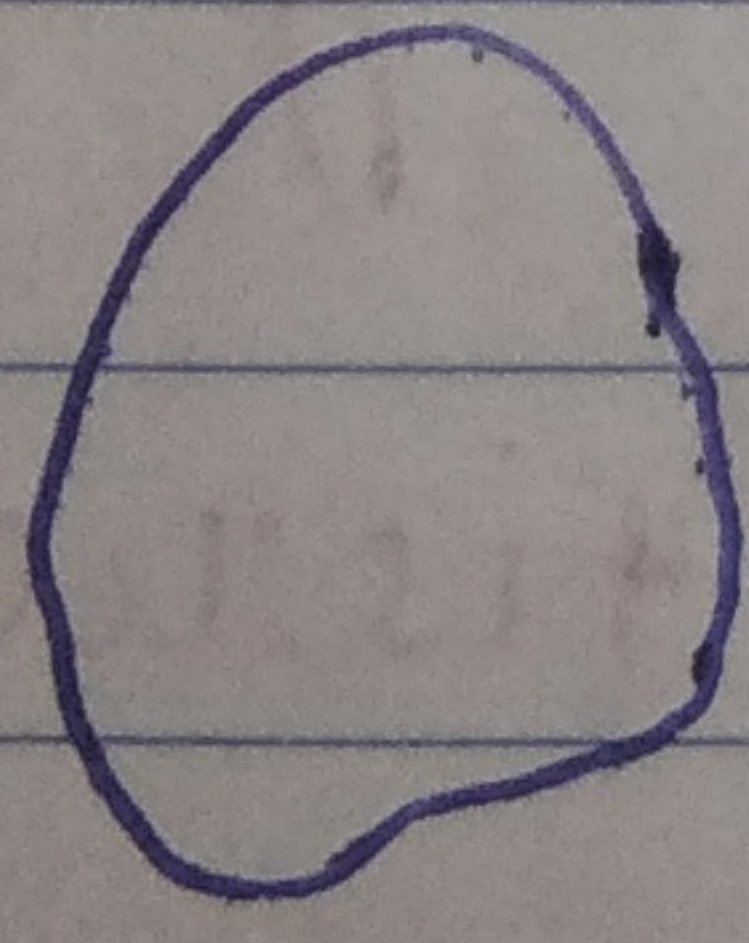
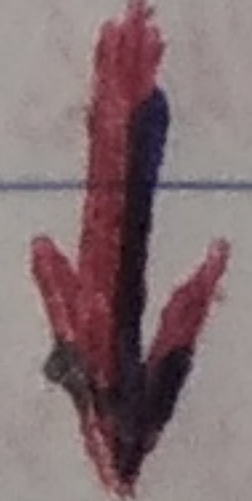
Somatic embryogenesis occurs by induction of embryogenic cultures from zygotic seed/leaf or stem segment. These mature embryos are further cultured for germination & development of plantlets & finally transferred to the soil.



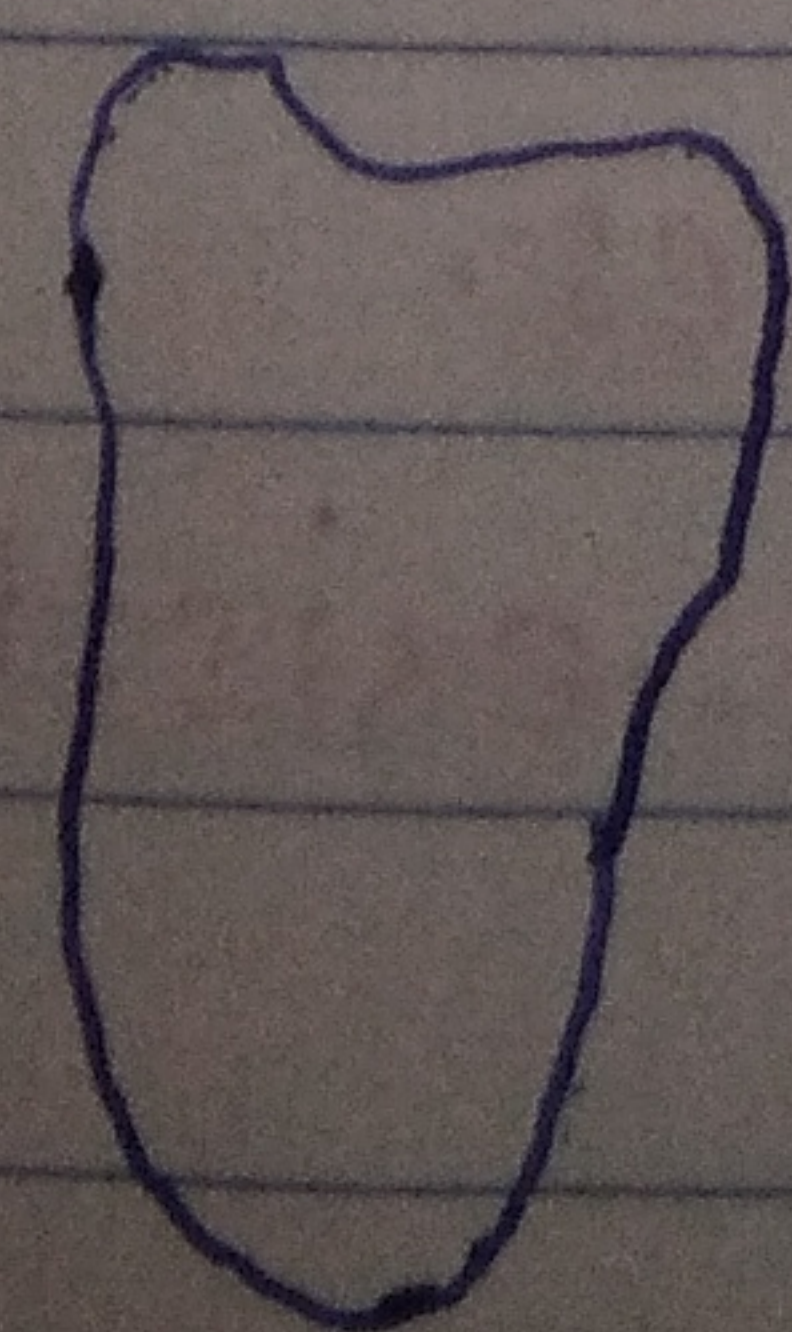
Single cell



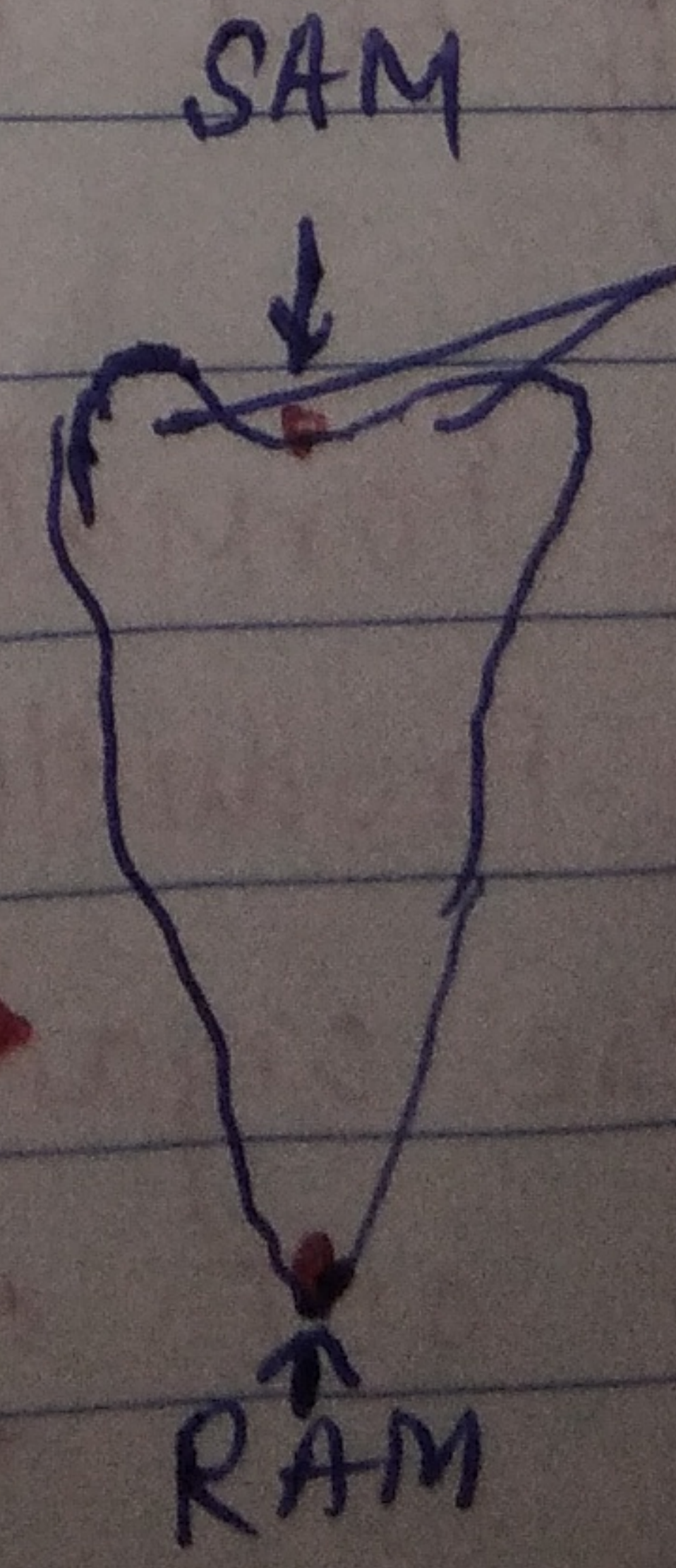
Group of cell



Globular embryo



Heart shaped embryo



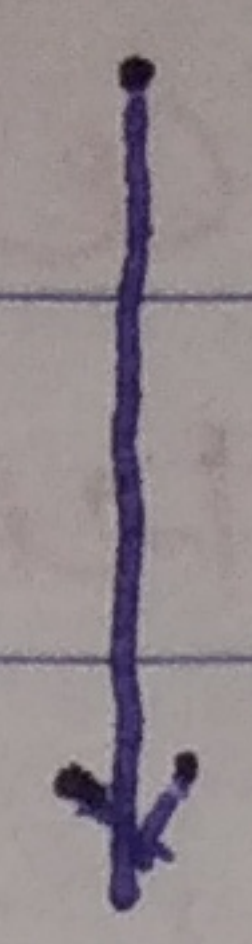
Torpedo stage embryo

Indirect organogenesis

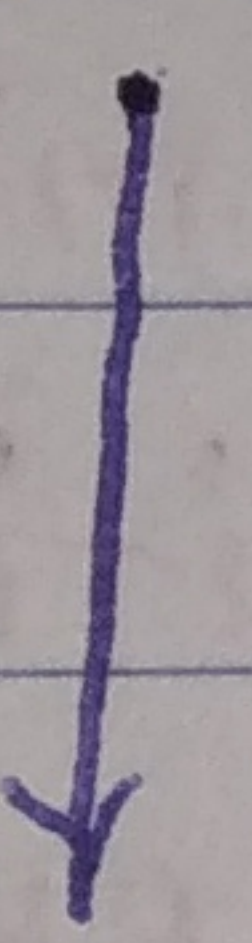
Plant Growth Regulators & differentiation →

Indirect organogenesis can be written in simple forms like -

Ex Plant



Callus



Meristemoid



Primordium

Skoog & Miller have much contribution to understand the mechanism of regeneration of whole plant or part of plant from cell. They observed that direction of differentiation could be influenced by the ratio of exogenously supplied Auxin & cytokinin & found that -

- ↑ Ratio of Auxin to cytokinin leads to initiation of root.
- While low ratio of Auxin to cytokinin leads to initiation of shoots
- In Tobacco stem pith culture.

Direct organogenesis - The role of Growth Regulators

It is simply explained as Direct Root / Shoot Formation from the explant.

Direct organogenesis is a process which Bypasses the Need for a callus phase. for ex -

Formation of somatic embryos through direct embryogenesis proceed from cells which were already embryogenically competent while they were part of the original, differentiated Tissue.

The formation of these pre-embryogenic cell favored only in certain condition like wounding or application of Exogenous Growth

regulators which allows the process of cell division & expression of embryogenesis and are tend to be more responsive than the pre-embryonic cells derived from indirect organogenesis and direct organogenesis don't require the auxin 'push' to initiate division. However, cytokinin play an important role in switching between shoot development & embryogenesis.