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## **Cellular totipotency**

The potential of a plant cell to grow and develop into whole new multicellular plant is described as **cellular totipotency**. The property of single cell for differentiating into many other cell types is called totipotency. This is the property which is found only in living plant cells and not in animal cells. The term totipotency was coined in 1901 by Morgans. During culture practice an explant is taken from a differentiated mature tissue. It means the cells in explants are generally non dividing cells undergoes changes which revert them into a meristematic state (callus state) . This phenomenon of reversing back of mature cells to dividing state is called dedifferentiation. Now these dedifferentiation cells have the ability to form a whole plant or plant organ. This phenomenon is termed as redifferentiation.

Dedifferentiation and redifferentiation are the two inherent phenomenon involved in the cellular totipotency. Regarding this it is clear that the cell differentiation is the basic event for development of plants and is also referred to as cyto differentiation. To express its totipotency a differentiated cell first undergoes the phenomenon of dedifferentiation and then undergoes the redifferentiation phenomenon. Usually the dedifferentiation of the explant leads to the formation of callus. However the embryonic explant sometimes result in the differentiation of roots or shoots without an intermediary callus state.

### **Application of totipotency**

1. It has potential application in the crop plant improvement.
2. Micropropagation of commercially important plants.
3. Production of artificial or synthetic seeds

4. It helps in conservation of germplasm.
5. This ability is utilized for haploid production.
6. Applied in producing somatic hybrids.
7. For high scale and efficient production of secondary metabolites.
8. The genotypic modification can also be possible.