Agrobacterium mediated gene transformation in plants

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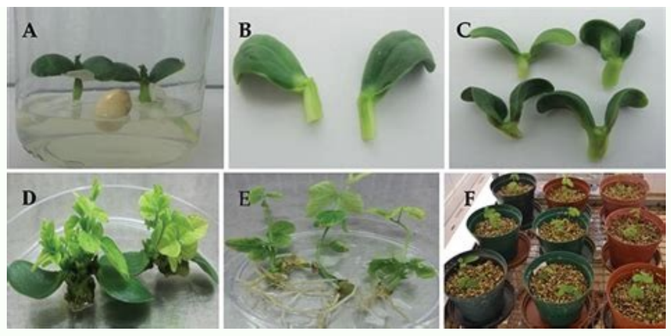

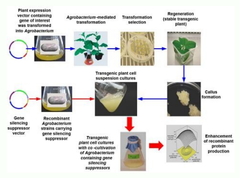

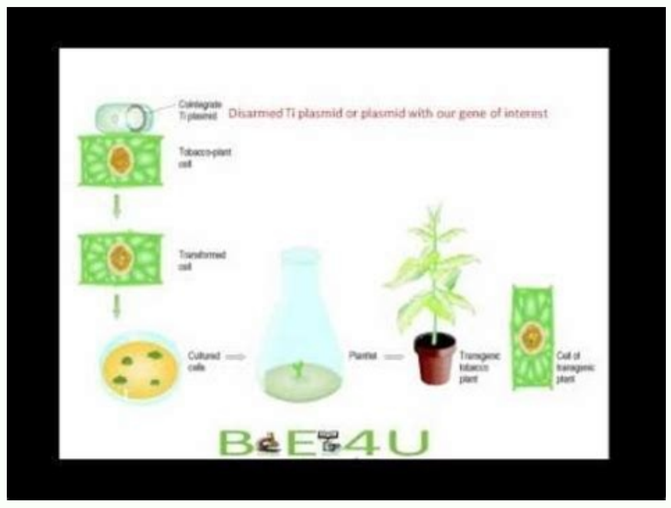

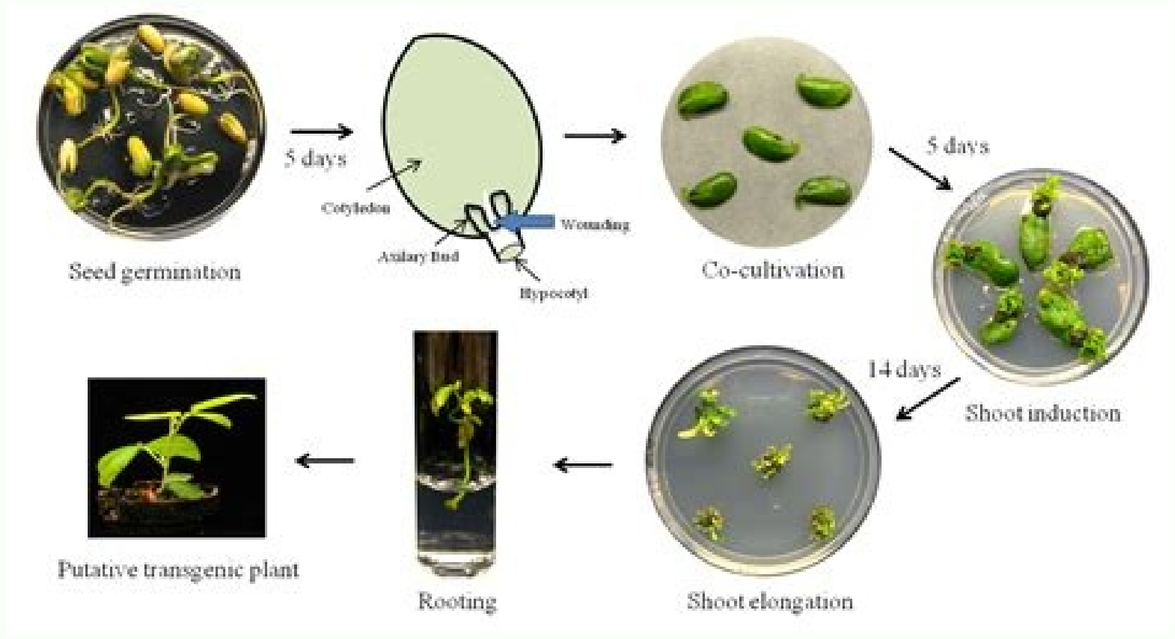

What is the role of agrobacterium tumefaciens in plant transformation. What is agrobacterium mediated transformation. Why is agrobacterium mediated genetic engineering transformation. Why is agrobacterium mediated transformation described as natural genetic engineering in plants.

Agrobacterium, the natures' genetic engineer, has been used as a vector to create transgenic plants. Agrobacterium-mediated gene transfer in plants is a highly efficient transformation process which is governed by various factors including genotype of the host plant, explant, vector, plasmid, bacterial strain, composition of culture medium, tissue damage, and temperature of co-cultivation. Agrobacterium has been successfully used to transform various economically and horticulturally important monocot and dicot species by standard tissue culture and in planta transformation techniques like floral or seedling infilteration, apical meristem transformation, and the pistil drip methods. Monocots have been comparatively difficult to transform by Agrobacterium. However, successful transformations have been reported in the last few years based on the adjustment of the parameters that govern the responses of monocots to Agrobacterium. A novel Agrobacterium transferred DNA-derived nanocomplex method has been developed which will be highly valuable for plant biology and biotechnology. Agrobacterium-mediated genetic transformation is known to be the preferred method of creating transgenic plants from a commercial and biosafety perspective. Agrobacterium-mediated gene transfer predominantly results in the integration of foreign genes at a single locus in the host plant, without associated vector backbone and is also known to produce marker free plants, which are the prerequisites for commercialization of transgenic crops. Research in Agrobacterium-mediated transformation can provide new and novel insights into the understanding of the regulatory process controlling molecular, cellular, biochemical, physiological, and developmental processes occurring during Agrobacterium-mediated transformation and also into a wide range of aspects on biological safety of transgenic crops to improve crop production to meet the demands of ever-growing world's population. Shewry PR. Wheat. J Exp Bot. 2009;60(6):1537–53.CAS PubMed Google Scholar Bartlett JG, Alves SC, Smedley M, Snape JW, Harwood WA. High-throughput Agrobacterium-mediated barley transformation. Plant Methods. 2008;4(1):22.PubMed PubMed Central Google Scholar Hinchliffe A, Harwood WA. Agrobacterium-mediated transformation of Barley immature embryos. Methods Mol Biol. 2019;1900:115–26.CAS PubMed Google Scholar Wingen LU, West C, Leverington-Waite M, Collier S, Orford S, Goram R, Yang C-Y, King J, Allen AM, Burridge A, Edwards KJ, Griffiths S. 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