

Title: Plant Biotechnology [2-0-4-8]

Content :

Theory

Introduction; Crucial milestones in Plant Tissue Culture; Plant hormones & their roles in physiology and development; Cell, tissue and organ cultures – Seed culture / callus culture / cell suspension / embryo culture / meristem culture; Advantages and challenges in plant tissue culture; Plant transformation – a quick introduction to plant genetic markers & molecular breeding / Vectors, promoters, terminators for plant transformation; Genetic Engineering in plants – different methods of plant genetic transformation – ATMT / Gene Gun and Electroporation / Chloroplast transformation; Applications of Genetic Modification in plants & Concerns and Regulations of GM crops – 3 classic examples (including Golden Rice)

Lab practical

Explant sterilization techniques – Discussion & Demo; Stock preparation (especially hormones) – Discussion on calculations; Tissue culture - Seed culture / callus culture / cell suspension / embryo culture / meristem culture; Plant transformation & Regeneration – Recombinant DNA (theory - discussion) / Agrobacterium transformation / callus transformation / selection of transformants / regeneration into plantlets / hardening

Texts / References:

- 1) H.S Chawla. (2002). Introduction to plant biotechnology. Science Publishers.
- 2) Adrian Slater (2008). Plant Biotechnology: the genetic manipulation of plants. Oxford University Press.