



Molecular Biology & Biotechnology

After successful completion of the course, students will have knowledge in the subjects of molecular biology and biotechnology with an emphasis on plant production and food.

Students will be able to:

- To understand plant molecular biology, gene expression and management of genetic material
- To become familiar with basic techniques of molecular biology
- To understand the possibilities offered by molecular biology and biotechnology to address problems of agricultural interest
- To know the main applications of tissue culture and genetic engineering in plant production and food
- Understand the need for risk assessment and legislative regulation of genetically modified organisms and foodstuff.

Course content:

- Introduction to Plant Molecular Biology: Structure and physicochemical properties of biological macromolecules, Transfer of genetic information, Copying, Transcription, Translation, Plant Gene Structure, Mechanisms of Gene Expression Regulation, Molecular Biology Techniques.
- Key Technologies: Microorganism cultures – Fermentation, Enzyme technology, Genetic engineering - Recombinant DNA technology, Cloning, Genetic transformation, Genomic and cDNA libraries, Polymerase chain reaction (PCR), Molecular markers (RFLP - RAPD - AFLP etc.), In vitro culture of plant tissues and cells, Protoplast technology.
- Plant Biotechnology - Applications in Agriculture: Creation of genetically modified (transgenic) plants, Gene transfer through *Agrobacterium tumefaciens*, Direct gene transfer, Applications of transgenic technology, Benefits and possible risks of the use of genetically modified organisms, Economic importance and spread of transgenic plants, Genetically modified food legislation.