

## CHAPTER 19

### GENETICS

#### Doctoral Theses

176. AGARWAL (Parul)  
**Optimizing transgene expression in plants : Identification and testing of promoters from Arabidopsis Thaliana for constitutive Expression and Analyzing Codon Usage Patterns.**  
Supervisor : Dr. Pradeep Kumar Burma  
Th 18195

#### *Abstract*

It identify and test upstream region of genes, (Promoters along with 5' UTRs) from Arabidopsis thaliana for achieving expression levels at par if not better than CaMV 35S and studied the role of codon usage in improving expression of transgenes. The genes which show high transcript levels are identified by carrying out meta-analysis of microarray datasets from A. thaliana.

#### *Contents*

1. General Introduction. 2. Meta-analysis of microarray data from Arabidopsis thaliana to identify (i) regulatory signatures in constitutive up-regulated genes (ii) promoters for experimental analysis. 3. A comparative analysis of activity of promoters of A. Thaliana vis-a-vis CaMV 35S. 4. Codon usage patterns and gene expression (i) an in-silico study in Saccharomyces cerevisiae (ii) experiments in tobacco.

177. GUPTA (Brijesh)  
**Development of Tomato Transgenics for Abiotic Stress Tolerance.**  
Supervisor : Prof. M V Rajam  
Th 18194

#### *Abstract*

Agrobacterium-mediated co-transformation of tomato is done by infecting the explants with two Agrobacterium tumefaciens (LBA4404 strain) cultures (Mixed in 1:1 ratio v/v and grown to

the same O.D.), harboring binary plasmids pMVRmt1D(-hpt) and pCAMBIA2300 respectively. The co-cultivated explants are selected on SRM containing 30 mg/1 kanamycin, and several transformed shoots are recovered. Tomato transgenics are developed against multiple abiotic stress conditions such as salinity, drought, heavy-metal and low temperature via over-expression of a key polyamine biosynthetic gene, odc (ornithine decarboxylase) using Agrobacterium-mediated genetic transformation.

*Contents*

1. Introduction. 2. Review of literature. 3. Materials and methods. 4. Results and discussion. 5. Summary and conclusion. 6. Reference.

178. KUMAR PARITOSH  
**Identification and Isolation of Promoters from Gossypium Hirsutum L. for Achieving Optimum and Tissue Specific Transgene Expression.**  
 Supervisor : Prof. Deepak Pental  
 Th 18196

*Abstract*

This work has identified and isolate different genes and promoters of the rbcS gene family from G. hirsutum and its parental diploid species and the highly expressing members of the rbcS gene family in different tissue of the cotton plants (G. hirsutum). G. hirsutum variety Coker 310 FR is used for all the molecular analysis. Based on the conserved region identified by the comparison of nucleotide and amino acid sequences of a number of rbcS genes, degenerate primers are designed.

*Contents*

1. Isolation and Characterization of rbcS gene family from cotton. 2. Identification and isolation of another specific genes from cotton.

179. MANEESH KUMAR  
**RNAi-Mediated Targeting of Acetylcholinesterase Gene of Helicoverpa Armigera for Insect Resistance in Transgenic Tobacco and Tomato.**  
 Supervisor : Prof. M V Rajam  
 Th 18238

*Abstract*

This study have explored the effects of knocking-down of the expression of AChE gene through RNAi on growth and development of *H. armigera* larvae at both embryonic and post-embryonic levels. This strategy is further applied for in planta RNAi-mediated control of polyphagous insect pest, *H.armigera*. The AChE gene silencing through in vitro approaches of application of siRNA along with the dietary path, resulted in perturbation of several biological parameters of the insects.

*Contents*

1. Introduction. 2. Review of literature. 3. Materials and methods. 3. Results and discussion. 5. Summary and conclusions. 6. References.

180. SINGH (Sandeepa)

**Plant Regeneration, Agrobacterium - Mediated Transformation and Development of Transgenic Plants with CTV Coat Protein Genes in Citrus Sinensis.**

Supervisor : Prof. M V Rajam  
Th 18197

*Abstract*

It has developed an efficient plant regeneration protocol for *C. sinensis* via *Agrobacterium* using viral coat protein gene constructs. Also standerised efficient *Agrobacterium*-mediated genetic transformation protocol for *C. sinensis* using GUS reporters gene construct and GUS expression and molecular characterization (transgene integration and expresson) of Citrus transformation with GUS gene construct.

*Contents*

1. Introduction. 2. Review of literature. 3. Materials and methods. 4. Results and discussion. 5. Summary and conclusions. 6. Reference.

## M.Phil Dissertations

181. PANDEY (Divya)  
**Evaluation of Anti-Malarial Activity of Soyaphosphatidylcholine- Stearylamine Liposomes for the Treatment of Murine Model in Malaria.**  
Supervisor : Prof. Anil K Tyagi
182. SINGH (Swati)  
**Comparison of Various Methods for Extraction of Protein from Bacterial Cells.**  
Supervisor : Prof. R C Kuhad
183. SINHA (Vidusha)  
**Regulation of Antibiotic Production in Biocontrol Strain Pseudomonas Fluorescens Psd.**  
Supervisor : Prof. S. Srivastava
184. SRIVASTAVA (Priyadarshani)  
**Protective Efficacy and Immune Responses of Various Vaccine Regimens Against Tuberculosis in Murine Model.**  
Supervisor : Prof. Anil K Tyagi