



ATG..... Initiation codon  
for Knowledge Society

## BIOTECH RESEARCH PROJECT

Genetic Engineering: PCR, cloning & sequencing  
protein structure prediction by comparative genomics approach  
Exclusively designed and students seeking PhD abroad and R&D Jobs in India  
**Course coordinator: Devendra Lingojwar, Director, ATG LAB**

**Research Areas: 1. Molecular Microbiology; 2. Plant Molecular Biology; 3. Applied Bioinformatics; 4. Plant virology; 5. PCR diagnostics**

### Course content for project

**Section I:** Basic Theory of each protocol with guidance for further reading from standard text and reference books, soft copies will be provided by guide, How to operate all instruments required for lab (demonstration and individual handling), Calculation of all reagents in project, Reagent preparation, Micropipette handling, Complete Training in desired area of interest available in the lab, Preparing for lecture and CVs for job, How to explain gap in interviews and how you are devoted for research and which field of Biotech / Life sciences.

**Section II:** Training for junior students under your guidance, lectures to trainee students, guidance for instrumentation as well as protocol preparation, calculation etc.

**Section III:** Collection of references from Pubmed, Review writing, Preparation of protocol, reading troubleshooting and guidelines for failures, Drafting projects for funding, how to write publication based on findings. Oral and Poster preparation for presentation in conferences

#### Section IV: Your own Research Project: (75% credit hours)

##### A. Bioinformatics softwares and database studies

1. Introduction to NCBI database gene / genome – whole and partial sequences; ITS2 database; 16S RNA database; 2. Sequence selection and edition for studies of interest; 3. Primer designing: manual and by software, Primer order; 4. Working with new set of primers: Calculation and dilution upto picomoles

##### B. Microbiology and molecular biology

5. Microbiology techniques: Sample collection, Sterilization and disinfection, Media; preparation, Spread plate method, Subculturing by streak plate method, pure culture; preparation, glycerol stock preparation etc; 6. DNA extraction of bacteria by DNAzol method and spin column method

##### C. PCR technology:

7. Optimization and standardization of PCR conditions: Primers conc., dNTPs, Taq Polymerase, MgCl<sub>2</sub> etc; 8. Gradient calculation and gradient PCR for standardization of cycling conditions; 9. Scale up PCR (post gradient PCR)

**D. Gene cloning:** TA cloning of PCR product and sequencing of cloned PCR product: 10. ligation and 11. transformation in E.coli, 12. colony PCR and (13. DNA sequencing: outsource studies)

##### E. Applied Bioinformatics on available sequence data

14. DNA sequence data interpretation and analysis; 12. BLAST, BLAST2, Reverse complement, BLAST tree, multiple sequence alignment by Clustal W, Phylogenetic tree by MEGA 4.1, Proteomics: ClustalW; Discovery studio, UCSF Chimera 1.5.3,

**F. Thesis writing:** Preparation of thesis based on data generated in the project and submission at ATG LAB

**Duration and fees:** Min 6 to Max 12 months Please enquire for fees by email. Send enquiry to [atgbiotechproject@gmail.com](mailto:atgbiotechproject@gmail.com)

**Eligibility:** Masters degree in Science and Engineering in Biotechnology / any Life Sciences from recognized university

**Deliverable:** 1. Complete confidence in the area of completed project before you enter in the job market; 2. First authorship in publication of DNA and protein sequences in NCBI database; Authorship in research paper whenever communicated for journal (applicable for BIG/combined projects), Preparation of CV for job, Reference for CV, Guidance on phone before interview related to area of guidance

**For more details, visit our lab, discuss with us, discover your self, what you wants to do; Find your interest in specific area of studies, and then confirm.....**

#### DEVENDRA LINGOJWAR

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