Individual Training
First Time In INDIA

BIOTECHNOLOGY
Professional Training Program

atg

ATG1: Biotechnology and bioinformatics : Biotech protocols: DNA extraction, PCR for extracted DNA, Transformation, Protein isolation, purification and separation by SDS PAGE (Poly Acrylamide Gel Electrophoresis) **Bioinformatics protocols for viral, Bacterial & human genomics: NCBI / Pubmed** (Finding gene from genome, FASTA, Gene Bank, Graphic) **Bioedit (**DNA sequence data curation, reverse and forward primer sequence tally), **BLAST** (Genomic comparative studies with 100 sequences), **Reverse complement** and **BLAST2**, NCBI BLAST tree, **MEGA 4.1** (Phylogenetic tree) : 4**0 days**

ATG2: Recombinant DNA Technology and Genetic EngineeringDNA extraction, Nested Two step PCR for Viral detection, (only a part of non infectious viral DNA cloned in plasmid, biologically safe for students handling), Agarose gel electrophoresis, Restriction digestion: By Eco RI / Hind III restriction endonuclease, Ligation By T4 DNA ligase, Subculture of *E. Coli,* Preparation of *E. coli* (host cells) in log phase, Competent cell preparation by $CaCl_2$ method, Transformation, Insertion of plasmid into competent *E. coli,* Screening of transformants, calculation of transformation efficiency, SDS PAGE, Western blot: 4**0 days**

ATG 3: Complete PCR technology: All types of PCRs with one DNA and one RNA extraction protocol (Level 1 PCR with ready to do master mix, Nested two step PCR for viral diagnosis with diagnostic primers, Gradient PCR for standardization of new PCR, Touch down PCR for Trouble shooting, bacterial identification PCR by 16S rRNA conserved region primers), How to set up PCR reaction: calculation for PCR reagents, Introduction to Primer designing
20 - 30 days

ATG 4: Transformation: Subculture of E. coli preparation of log phase bacteria; preparation of plasmid; preparation of competent cells; transformation, screening of transformants: **6 -10 days**

ATG 5: rDNA technology: DNA extraction, Level 1 PCR with ready to do master mix, Restriction digestion, Subculture of E. coli; preparation of log phase bacteria; preparation of competent cells; transformation, screening of transformants: **20 days**

ATG 6: Human RT PCR : RNA isolation by Trizol, cNA preparation RT reaction on RNA extracted from HeLa cell line, PCR from cDNA, DNA electrophoresis for visualization of PCR product on agarose gel: **6 – 10 days**

ATG 7: Introductory PCR training: Level 1 PCR with ready to do master mix and DNA electrophoresis; Nested PCR with two sets of primers for viral detection and DNA electrophoresis: **6 days**

ATG 8: Basic molecular biology: Basic students PCR (Level 1 PCR with ready to do master mix & DNA electrophoresis; Nested PCR with two sets of primers for viral detection & DNA electrophoresis, DNA extraction & PCR with extracted DNA & DNA electrophoresis: **10 days**

ATG 9: Advanced molecular biology: Basic students PCR (Level 1 PCR with ready to do master mix & DNA electrophoresis; Nested PCR with two sets of primers for viral detection & DNA electrophoresis, DNA extraction & PCR with extracted DNA & DNA electrophoresis, Subculture of E.coli; preparation of log phase bacteria; preparation of plasmid; preparation of competent cells; transformation, screening of transformants: **20 days**

ATG 10: Applied molecular biology:
Basic wet lab biotech overview: Individual handling of all imported Equipments and Instruments**:** Biorad Thermalcycler Gradient, Gel doc, quantity one software, Universal powerpack, Subcell GT submarine electrophoresis, Tetracell Vertical elelctrophoresis, **Nucleic acid isolation, PCR & DNA electrophoresis:** DNA and RNA extraction a. Standard general student's PCR, b. Nested PCR for viral diagnosis by diagnostic primers set, c. Gradient PCR: Standardization of new PCR, d. Applied PCR for bacterial detection from conserved region primers, **Reverse Transcriptase PCR:** RT-PCR for specific Human cell lines with DNA electrophoresis **Transformation:** Competent cell preparation, transformation, identification of transformants, **Protein:** Collection, Processing, Isolation, purification, Hb electrophoresis & comparative studies with clinical profile, Pedigree analysis of genetic disorder and Gene flow studies from actual research project at ATG, Standard SDS PAGE, **Applied Bioinformatics:** Reading DNA sequence from Applied Biosystems 310 / 3100 Genetic analyzer, Correction of sequence data for data selection for BLAST, Reverse and forward primer data interpretation, Primer designing: Bioinformatic Software and tools for designing primers, BLAST, Phylogeny introduction, **Assessment after training:** Lectures by trainee, calculation demonstration to new fresh trainees, Group discussion, PowerPoint presentation, CV preparation for particular interviews etc: **60 days**

ATG 15: Immunology and Virology: Recent & Past infection studies by ELISA: IgG & IgM detection, Viral antigen detection by standard nested PCR, RT PCR, PAGE & Western blot, **30 days**

ATG 16: Molecular blotting: DNA & RNA extraction and isolation of protein, DNA electrophoresis and Southern blot, RNA electrophoresis and Northern blot, Protein electrophoresis and Western blot: **20 days**

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