



Short Term Training Course on
**Genomics and proteomics of plants and
microbes towards translational research**

Sponsored by
Department of Biotechnology, Government of India



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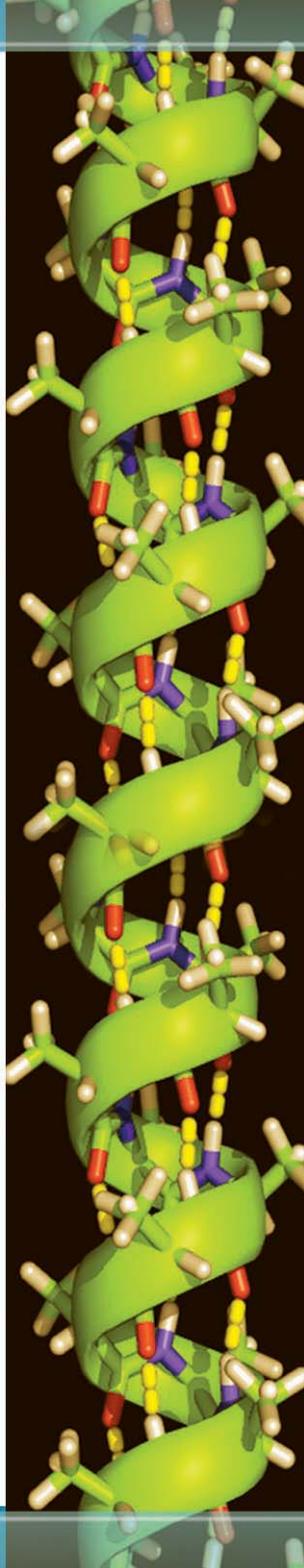
ICAR - Indian Institute of Spices Research
Kozhikode, Kerala -673012

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Background

Plant/microbial genomic research now faces the ultimate challenge to develop applications in crop plants which implies the transformation of genomic/proteomic information through translational research. The term translational research refers to the exploitation of the information generated by research for useful applications. In view of ever increasing population and decreasing natural resources, there is need to enhance food production by improving qualitative and quantitative traits of plants by adopting new analytical tools and technologies. We are in the midst of a golden period for research into sustainable cropping system in which the ongoing development and integration of various omics-technologies with established biochemical, molecular and genetic approaches have created a near “perfect pitch” for plant and microbial research.

Knowing whole genome/proteome and even the localization of all genes/ proteins of an organism is only the anatomical description of the genome. Hence it is needed that the sequence information is further translated into function. In a broader perspective genomics is the study of gene-environment-host interaction and proteomics is the extension of genomics that gives understanding of gene functions. Recent advances in genome/ proteome-based studies on plant as well as plant-associated microorganisms have transformed our understanding of many plant pathogens and are beginning to greatly widen our knowledge of plant interactions with pathogenic and beneficial microorganisms. These technological platforms have shown its great potential to bridge the gap between plant and microbes, which have traditionally been two distinct research fields in crop production.



ICAR - Indian Institute of Spices Research under ongoing outreach project on *Phytophthora*, *Fusarium* and *Ralstonia* diseases of horticultural and field crops is working with the research paradigm as genomics (plant/ microbe/ host plant resistance), transcriptomics and proteomics (host-pathogen interaction). The significant achievement includes the development of two whole genome sequences of *Phytophthora capsici*, *Ralstonia solanacearum*, four representative transcriptome for *Phytophthora.capsici-Piper nigrum*, *Phytophthora.capsici-Piper colubrinum*, *Ralstonia solanacearum*-ginger and mango ginger pathosystems, leaf proteome of black pepper and their databases. With this expertise this course ‘Genomics and proteomics in plant and microbes towards translational research’ has been designed. This training course would be an attractive platform for hands on training and discussions to orient the researchers towards translational research of genomics and proteomics to come up with new and improved agricultural practices for sustainable agriculture.

Objective of the course

- ✳ To expose the participants to various techniques in genomics and proteomics.
- ✳ To provide hands on training in variants of PCR, allele mining, gene expression and proteomics, its application in agriculture.
- ✳ To orient the participants on comparative genomics, gene-trait association and molecular mapping.
- ✳ To enable the participants in handling various bioinformatics tools to assist the genomic and proteomic research.

Course content

Isolation of plant/microbial DNA, AGE, candidate gene isolation, genomic and c-DNA library construction, cloning and sequencing, basic bioinformatics tools, phylogenetic clustering of genes, analysis of genomic variation SNPs, comparative genomics, genome and proteome mapping, allele mining, gene expression analysis using qPCR, PAGE, 2 dimensional protein profiling, off gel protein fractionation and analysis, MS analysis, protein database search tools, IPR and biosafety issues.

Who can attend

Mid-career scientists / UG and PG teachers holding regular positions in universities/national labs/ research institute/ in-house R&D centers, having masters degree in any branch of plant science/microbial sciences are eligible to apply. *The participants who have been sponsored by their parent institution will be given preference in the selection process.*

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APPLICATION FORM FOR PARTICIPATION

1. Full name :
2. Designation :
3. Nature of work :
4. Office address :

5. Address for correspondence :

6. Educational Qualifications :
7. Age :
8. Sex :
9. Research area(s) :

10. R & D facilities available at work place :

11. Research Projects
 Programs with the applicant / Institution :
12. How the present course will be helpful :
13. Whether applicant attended any other
 DBT sponsored training course (If yes, provide details):
14. Whether the candidate is sponsored with TA & DA:

14. Signature of the candidate with date :

15. Remarks and signature of the forwarding
 authority with seal :