

**ICAR-CAFT in Agricultural Microbiology**  
**Recent trends in Plant-Microbe Interactions**  
 27 Nov - 17 Dec, 2018

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 passport size  
 photo

**Application Format**

1.	Name	
2.	Designation	
3.	Age & Sex	
4.	Institute employed	
5.	Total service	
6.	Experience (years)	
7.	a) Teaching	
	i) Undergraduate	
	ii) Postgraduate	
	b) Research	
8.	Academic record	
9.	Field of specialization	
10.	Address for correspondence (Include Email & mobile)	
11.	Accommodation	Required / Not required
12.	Address of the sponsoring institute	
		Signature of the candidate
	Recommendation of the Head of the Institute	
		Signature & Seal of the Head of the Institute



**ICAR - Centre for Advanced Faculty Training in  
 Frontier and Specialized Areas of Agriculture and  
 Allied Sciences (2018-19)**

**ICAR-CAFT in Agricultural Microbiology**  
**Recent trends in Plant-Microbe Interactions**  
 27 Nov - 17 Dec, 2018



**Department of Agricultural Microbiology**  
**Directorate of Natural Resource Management**  
**Tamil Nadu Agricultural University**  
**Coimbatore 641 003, Tamil Nadu**  
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## Introduction

In order to feed the present population, our country needs a new vision for agriculture. Delivering food security, the process of increasing food production and improving food quality to sustain population growth without compromising environmental safety has been called a second green revolution. The most promising strategies to reach this goal is to substitute hazardous agrochemicals (chemical fertilizers and pesticides) with environmentally friendly preparations of beneficial microbes and building fitness of the crop plants through microbiome. This could improve the nutrition of crops as well as soil health and also confer protection from biotic (pathogens and pests) and abiotic (including pollution and climatic change) stresses. For this, scientific attempts are required to expand our molecular understanding of the plant-microbiome interaction and its impact on plant health and productivity.

Soil microorganisms colonize the roots of crop plants and develop a unique micro-environment called rhizosphere. The total microbial life of rhizosphere, rhizo-microbiome, its structural and function is dictated by the root exudates of the plant and soil properties. Root colonizing microbes support the plant health by increasing the nutrient availability, enhancing root growth, neutralizing toxic compounds, making plants more resistant to pest and diseases, temperature, flooding and drought and deterring pathogens and predators.

Hence, plant health and fitness are greatly impacted by the microbiota which in turn governed by soil organic carbon and this will continue to be an important research area, considering that plant fitness and crop productivity need to be carefully monitored for food security. This training will provide recent prospects and laboratory techniques for better understanding of plant-microbe interactions for sustainable agriculture.

## Course outline

**Theory:** Introduction to plant-microbe interactions (PMI) – Microbiome of crops: Rhizosphere, spermosphere, endosphere and phyllosphere – Plant metabolites in plant-microbe interactions – Microbial secrets and compounds in molecular plant-microbe interactions – Rhizo-microbiome: Effective colonization and biofilm formation; Quorum sensing and quenching in PMI – Plant and Fungi interactions – Root architecture in PMI – Beneficial PMI: Nutrient acquisition, drought mitigation and induced systemic resistance against pest and diseases – Insect-Microbe interaction in agricultural ecosystem – Mycorrhization and PMI.

**Practical:** Characterization of rhizo-microbiome – Root exudate and metabolomic analysis by LC/MS – Plant associated microorganisms: Isolation and characterization – Quorum sensing and biofilm forming bacteria in rice root – root system architecture by PGPR – reporter strains for PMI – Volatiles in PMI – Relative gene expression assay by reverse transcriptase quantitative PCR – Plant defense mechanisms during PMI – Insect microbiome analysis – Microscopy in PMI – Rhizotron and sophisticated instrumentation in PMI.

## Trainees

Teachers and researchers working in this area in SAUs, ICAR and other institutes not below the rank of Assistant Professor and equivalent in the concerned subject are eligible. The number of participants will be limited to twenty.

## Duration

Twenty one days (27 Nov - 17 Dec, 2018)

## Venue

Department of Agricultural Microbiology, Directorate of Natural Resource Management, Tamil Nadu Agricultural University, Coimbatore – 641 003.

## Travel

Traveling allowance will be met by the organizers. Depending on the availability of funds, reimbursement will be restricted to III tier AC / Sleeper class fares. No DA will be paid for the journey period.

## Food & Accommodation

DA for the stay at Coimbatore during the training period will be paid as per the recently revised rates of ICAR. Food and accommodation will be arranged at the University campus only for the participants on payment basis.

## Last Date

The application and brochure can be downloaded from the ICAR CBP website (<https://cbp.icar.gov.in>) or from our **Department website**. Completed application form in the prescribed format through proper channel should reach the **Director, CAFT in Agricultural Microbiology** on or before **31-10-2018**. All the applicants are requested to register and **upload their applications** in CBP portal (<https://cbp.icar.gov.in>).

## Contact us

### CAFT Director

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### Course Directors

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