

Course Schedule

Date	Module	Topic	Time
25 June 2018 (Monday)	Inauguration	Inaugural Address	10:30 to 11:30 hrs
	Lecture 1	Rhizosphere biology and functional food, involvement of microbes in our agricultural practices.	12:00 to 13.00 hrs
	Tutorial 1	Microbe Isolation techniques; establishing plant microbe interaction using model plant system <i>Arabidopsis thaliana</i> .	14:00 to 17.00 hrs
26 June 2018 (Tuesday)	Lecture 2	Molecular mechanism involved in beneficial plant-microbe interaction.	10:30 to 11:30 hrs
	Lecture 3	Biological control using benign rhizospheric microbes.	12:00 to 13:00 hrs
	Tutorial 2	Preparation of samples for establishing colonization of beneficial microbes on <i>Arabidopsis</i> roots. Microscopic techniques to establish colonization.	14:00 to 17.00 hrs
27 June 2018 (Wednesday)	Lecture 4	Plant microbiome and feed the world.	10:30 to 11:30 hrs
	Lecture 5	Not just sweet talkers: How roots stimulate their colonization by beneficial bacteria	12:00 to 13:00 hrs
	Tutorial 3	Rhizospheric sampling; Preparation of samples of rhizospheric community for diversity and abundance analysis.	14:00 to 17.00 hrs
28 June 2018 (Thursday)	Lecture 6	Human pathogen plant interactions	10:30 to 11:30 hrs
	Lecture 7	Rhizospheric microbes and plant immunity	12:00 to 13.00 hrs
	Tutorial 4	Analyses of results from day 1-3, discussion and establishment of high-throughput sequencing techniques for microbiome analysis.	14:00 to 17.00 hrs
29 June 2018 (Friday)	Lecture 8	Root microbiome is moderated by plant host factors.	10.30 -11.30 hrs
	Lecture 9	Functional plant microbiome and its implications for the next green revolution.	12.00 -13.00 hrs
	Tutorial 4	Brief presentations from participants and/or short quiz-type examination. Brainstorming with graduate students and postdocs to work and devise efficient strategies for studying plant microbe interactions.	14:00 to 17 hrs
30 June 2018 (Saturday)	Examination	Examination	11.00 – 13.00 hrs
	Discussion and problem solving	Discussion and problem solving	13.00 – 16.00 hrs
		Feed back and certificate distribution	16.00 – 17.00 hrs

How to reach Sagar

Sagar is well connected to Mumbai, Delhi, Jaipur, Baroda, Kolkata, Allahabad, Varanasi, Bhuvneshwar and other cities. Connecting trains are available from Bina Jn. (78 km)/Katni (Murwara) Jn. (190 km). The nearest Airport(s) are at Bhopal (200 km), Jabalpur (185 km) and Khajuraho (200 km).



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Ministry of Human Resource Development
Government of India

A Course Under
Global Initiative of Academic Networks
Ministry of Human Resource Development, Government of India
On

Molecular Beneficial Plant-Microbe Interactions and Functional Microbiome

25th - 30th June, 2018

By

Prof. Harsh Bais

University of Delaware, USA



Course Co-ordinator

Prof. Naveen Kango

Department of Microbiology

Dr. Harisingh Gour Vishwavidyalaya

(A Central University)

Sagar (M.P.) 470 003 India

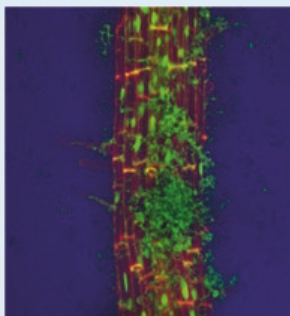
www.dhsgsu.ac.in | www.gian.iitkgp.ac.in

Overview

Agriculture depends upon large-scale cultivation of crops in field conditions. It has long been known that microbial communities in soil contribute valuable nutrients to crop plants (e.g. Rhizobia, and Azolla-associated cyanobacteria provide nitrogen to legumes and to rice, respectively). The impact of microbes on assimilation and turnover of ammonia, nitrates, phosphates, iron, manganese and other nutrients and micronutrients has been extensively documented.

Beneficial microbes can also protect plants from disease, as evidenced by the recognized "suppressive soil" effect. Yet relatively little is known about the diversity of microbes that associate with plants i.e. the microbiome, and their combinatorial interactions and effects on performance and crop yields. A comprehensive understanding of the effects of the microbiome on crop plants will enable the development of agricultural technologies that exploit the natural alliances among microbes and plants, and provide new avenues to increase yields beyond conventional plant genetics and breeding.

In above purview, the role of academia becomes more important, which can contribute by spreading knowledge about use of benign microbes for crop productivity to the society and most importantly by developing new methods in sustaining agricultural practices. Organization of MHRD-GIAN program at Department of Microbiology, Dr. Harisingh Gour Vishwavidyalaya, Sagar (MP) would be of great importance to the researchers in the area and to initiate new avenues of research investigating beneficial plant microbe interactions.



Foreign Expert:
Prof. Harsh Bais
University of Delaware, USA
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Dr. Harsh Bais is alum of Dr. Harisingh Gour University, wherein he did his master's degree in Applied Microbiology in 1994. Dr. Bais went on to get his Masters of Engineering from BITS, Pilani in 1996 and then finished his Ph.D from CFTRI, Mysore in 2000. Dr. Bais moved to Colorado State University, USA to do his postdoc on rhizosphere biology and then moved to an independent faculty position in 2005 at University of Delaware. He is now an associate professor of plant and soil interface at University of Delaware. He has been actively involved in studying root secretome profiling and elucidation of rhizospheric plant microbe interactions. Dr. Bais's research work utilizes a multifaceted approach, integrating classical plant physiology, biochemistry and molecular biology to investigate the role of root derived secondary metabolites in agriculture and human health. The expertise of Prof. Bais in rhizosphere biology are highly applicable and can be well utilized in research and teaching programs. Dr. Bais has published over 143 peer-reviewed research papers and 10 international patents. Some of the patents of Dr. Bais' is now commercialized technologies and been adapted by various agricultural companies. Dr. Bais' work is cited over 12000 times per google scholar (H^{index} 46 and $i10^{index}$ 91).

Who can participate

Students (U.G., P.G.), Ph.D. scholars and postdoctoral fellows and academicians, scientists, laboratory personnel and researchers from reputed academic/health institutions and other organizations working in the area of microbiology, agricultural microbiology, environmental microbiology, host-pathogen interaction, soil microbiome, microbial diversity, bioinoculants etc.

Course Registration Fees

Students	INR 1000/- (INR 500/- for SC/ST candidates)
Faculty/Scientists/ Researchers/ Post Docs	INR 3000/-
Participants from industries	INR 4000/-
Participants from abroad	US \$500

The above fee includes registration fees and all the instructional materials with experimental facilities. Accommodation, if required, could be arranged for the participants on payment basis.

Registration Work Flow

MHRD-GIAN is a global program and participants are required to register online at GIAN portal <http://www.gian.iitkgp.ac.in>. Follow instructions at "Course Registration Portal" and submit login details with brief academic achievements. Rs. 500 is to be paid online for registration at GIAN portal. Participants then need to select course from the list at "Course Registration". Selected participants will be informed by e-mail and they need to submit the "Course Registration Fee" by Demand Draft in favor of The Registrar, Dr. Harisingh Gour Vishwavidyalaya, Sagar (M.P.).

Patron

Prof. Raghavendra P. Tiwari

Vice-Chancellor,
Dr. Harisingh Gour Vishwavidyalaya, Sagar

Advisors

Prof. S.P. Vyas, Dept of Pharm. Sciences
Prof. J.D. Ahi, Dean, School of Biological Sciences
Prof. A.N. Sharma, Director, Academic Affairs
Prof. A. Pandey, Director, Faculty Affairs
Prof. R.P. Mishra, Director, Planning & Resource Generation
Prof. H. Thomas, Director, Research & Development
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Faculty Support

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Programme Committee

- Mr. Bhanu Pratap Prajapati
- Mr. Rahul Kumar Suryawanshi
- Ms. Sarika Agrawal
- Ms. Ritumbhara Choukade
- Mr. Uttam Kumar Jana
- Ms. Sonam Dohare

Prof. Devashish Bose, Local Coordinator GIAN
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