

LS646 PLANT PATHOGEN INTERACTION

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S. No.	Topics	Contact hours	Faculty
1.	Basicsofplant-microbeinteractions-Types of plant pathogens,modeof infection, and overviewof plant immuneresponses.	2	AN
2.	Plantimmuneresponses:Pattern-triggeredimmunity(PTI);effector-triggeredsusceptibility(ETS);effector-triggeredimmunity(ETI),innateandinducibleandimmunityinplants, ROSmetabolism&signaling,PR proteins, phytoalexins.	4	AN
3.	Biology ofbacterialandfungalpathogens,pathogeneffectors,bacterialandfungaleffectors,secretionofeffectorsandmechanismsofsuppressionofhostdefenserresponses,effectertargetsandmechanismofvirulence inbacterialandfungalpathogens.	5	PKV
4.	Hormones and transcription regulation – salicylic acid, jasmonicacid,ethylenesignaling,cross-talkofsignalingpathways.	4	AN
5.	Systemicacquiredresistance– mechanism,induction,geneticandepigeneticregulations.	3	AN
6.	RNA virus pathogenesis – basic steps of pathogenesis, entry anduncoating,viralgenomeexpression,synthesisofmRNA,hostfactors regulating viral replication, transcription, intra- and intercellularmovement,pathogenesisandinhibitionofhostgenetranscription byRNA viruses.	3	SC
7.	DNA virus pathogenesis – ss and ds DNA virus replication inpermissivehost;reprogrammingofplantcellcyclecontrols,translational control of viral gene expression (ribosome shunting,leaky scanning), nucleocytoplasmic trafficking of viral genome,modulationofubiquitylationandubiquitylation-likepathways.	3	SC
8.	RNAsilencinginvirusinfections– biology,mechanismsandapplications.SmallRNAsandprocessingpathwaysinplants(PTGS, TGS and miRNA), RNA directed DNA methylation, viralencoded proteins as suppressors of gene silencing in plants, VIGSvectors.	2	SC
9.	Host plant resistance against virus infection – resistance mechanismstoplantviruses(hostvsnonhostresistance),dominant	2	SC

	vs recessive resistance, N gene mediated innate immunity, Remorin and Ty1 mediated resistance.		
10.	Strategies to control viral, bacterial and fungal pathogens in crop plants, breeding and genomics-based strategies, genome editing for disease resistance, host-induced gene silencing, introduction of biological controls.	2	PKV

Suggested readings:-

1. Teaching will be done based on the latest research articles/reviews on respective topics and will be provided to the students.
2. Matthews' Plant Virology – Roger Hull. (Academic Press).
3. Applied Plant virology – DGA Walkey (Heinemann: London).
4. Plant pathogen interaction: Ed. N. Talbot, Kluwer Publication.
5. Biochemistry and Molecular Biology of Plants – Ed. Buchanan et al. ASPB Publication
6. Plant Pathology, by GN Agrios, Academic Press