

植物病理學系

教育目標

本系以生命科學為根本，發展植物醫學與應用微生物學之專業特長，培育學生擁有植物病理學及相關之生物技術等專業知識和應用微生物與農業生技產業發展有關專業技能。

課程規劃

本系設有大學部與碩、博士班，課程重點在強調植物病原微生物（含真菌、細菌、病毒、線蟲）及其與植物交互作用之關係、植物病原微生物生態及防治、生物技術在植病之應用及微生物科技在農業與環境保育之應用。重視病原微生物的研究及其診斷鑑定、植物病害防治、植物檢疫等專業人才培訓。學生可獲得之核心能力為：生命科學與基礎相關知識、植物病理學與防檢疫相關知識及技術、微生物學相關知識、農業生物技術與應用相關能力、植物醫學實務相關技術。

主要研究領域

- ◆植物病害病因學和病原分類學：發展快速、專一的鑑定與分類技術以鑑別真菌、細菌、菌質體、線蟲和病毒等植物病原微生物與研究菌株間的多樣性。
- ◆微生物生物技術與工業上的應用：開發微生物植物保護製劑產品（生物農藥）與應用方法；拮抗微生物基因的改良與利用；探討微生物製劑防治作物病害的理論基礎。
- ◆植物病原微生物的生態與傳染病學：研究果樹、蔬菜、花卉及糧食作物之致病微生物的傳播途徑與感染寄主植物的相關環境因子，以建立預測植物病害發生與管理的體系。
- ◆分子植物病毒學：病毒病害的鑑定；製備重要植物病毒的核酸探針與抗血清；植物抗病毒基因的選殖及應用；利用基因靜默機制生產抗多種病毒的轉基因作物；利用轉基因作物生產有用成份；利用病毒誘導基因靜默探討植物基因之功能。
- ◆分子植物病理學：研究植物病原微生物的致病相關因子；探討植物病原菌與寄主植物間의 交互作用；研究植物病態生理生化反應。
- ◆分子生物技術在植物病理學的應用：研究植物與微生物交互作用之訊號傳遞路徑，藉以闡明病原致病及植物抗病之機制；植物抗病基因之研析與應用。



▲開發快速檢測技術
Development of Rapid
Diagnostic Techniques



▲與國際學校技術教育交流
International Collaboration
in Education and Research

- ◆植物病害綜合管理技術之開發與推廣：研究病原微生物引起之作物病害的物理、化學及生物等綜合防治管理方法與技術；建立植物病害圖鑑與防治要領，透過資訊網路傳輸推廣教育之訊息。
- ◆自然資源的開發與利用：研究食用與藥用菌蕈的培育與利用；探討農業廢棄物、中草藥萃取物防治植物病害的成效與產品研製；開發有用微生物資源。

教研成果

本系配合國家經濟建設發展政策及世界生技潮流，發展環境及自然資源保育、植物基因工程及微生物生物技術等尖端科技領域。研究成果包括多項植物保護製劑專利配方、育成抗病毒之轉基因作物、可促進植物健康之土壤添加物及植物營養液之研發、建立重要作物之病害鑑定診斷技術、病原微生物之快速檢測方法與檢疫制度、研發天然植物保護製劑與非農藥防治植物病害的方法等。

本系成立逾68年，畢業系友超過2700餘人，分佈於各行各業，在各方面表現卓著，於公私立大專院校與中央農政與農試改良場所擔任要職。歷年來有13位系友獲頒中興大學傑出校友殊榮，其中郭宗德與余淑美系友獲選為中央研究院院士、葉瑩系友為財團法人農業科技研究院之首任院長、劉顯達系友獲美國總統終身成就獎。本系教師亦獲學術界與校內多項獎項，如財團法人傑出人才發展基金會『傑出人才講座』、科技部（國科會）傑出研究獎、教育部學術獎、教育部師鐸獎（總統獎）、全國十大傑出農業專家、中興大學講座教授、特聘教授、產學績優、教學特優等。本系教師與國內外各公私立機構合作研究計畫平均每年40餘件約5千萬元。近五年研究成果發表於國際SCI期刊、國內重要學術期刊、研討會、專書章節等600餘篇，獲國內外專利29件，其中近半已經正式技術轉移商品化應用。

Mission

The undergraduate program encompasses the fundamental life sciences focusing on the aspects of microbiology and plant medicine. The graduate program focuses on training graduate students to acquire specialized skills and knowledge in the subjects of plant pathology and applied microbiology.

Curriculum

The department offers degrees of the Bachelor of Science (BS), Master of Science (MS), and Doctor of Philosophy (Ph.D.) in plant pathology. The core curriculum aims to help students grow accustomed to the fundamental biosciences, plant pathology, and disease inspection and control. The students study plant pathogenic microorganisms and their interactions with host plants, ecological and pathological aspects of microorganisms, and develop effective strategies for disease control. The department employs modern biotechnologies and microbial technologies to enhance our understanding of plant diseases and preserve agricultural and natural resources. We train students to diagnose plant diseases, identify causal agents, and develop control measurements. Students become well equipped with various skills and ready to apply microbiology-, biotechnology-, and plant medicine-associated knowledge in various agricultural production activities.

Core Research Topics

- ◆ **Integrated Pest Management** : The incorporation of soil amendments and the integration of chemical and biological resistance crop strategies for controlling crop diseases effectively.
- ◆ **Etiology and Taxonomy** : The development of diagnostic techniques for the rapid and specific detection, identification, and classification of plant pathogenic microorganisms and their genetic diversity.
- ◆ **Molecular Virology** : The development of DNA- and protein-based detection methods for detecting plant pathogenic viruses, and the application of gene silencing in the production of virus-resistant crop plants and the study of functions of plant genes.
- ◆ **Molecular Plant Pathology** : The determination of the roles of pathogen-produced toxins, enzymes, and phytohormones in disease



▲病原分子致病機制教學核心實驗室
Core Laboratory of Molecular Mechanism for Pathogenicity of Phytopathogens



▲植物基因工程技術教學核心實驗室
Core Laboratory of Plant Genetic Engineering



▲穿透式電子顯微鏡
Transmission Electron Microscope



▲微生物醱酵量產先導型工廠
Small-scale fermentation Factory



▲病菌造成植物各部病害
Symptoms Caused by Pathogens



▲掃描式電子顯微鏡
Scanning Electron Microscope

development and the contribution of biotic or abiotic factors in the elicitation of resistance responses in host plants.

- ◆ **Development of biorational pesticides derived from microorganisms for plant protection and production.**
- ◆ **Ecology and Epidemiology** : Study of the biology and ecology of microbial pathogens during infection and the microbial factors involved in the suppression and conduciveness of disease development.
- ◆ **Exploitation of Natural Resources** : The cultivation of mushrooms for food and pharmaceutical purposes, utilization of agricultural wastes and medicinal plant extracts for promoting plant health and controlling plant diseases.

Achievements

Research conducted by our faculty has yielded several accomplishments, including the development of unique plant protectants from natural sources, the creation of antiviral crops through genetically modified approaches, the formulation of soil amendments for improving plant growth, the establishment of disease diagnosis systems and pathogen detection for economically crucial crops. In addition, the development of non-fungicide, microbe-based biocontrol agents for controlling plant diseases. Research on molecular plant-microbe interactions has generated abundant information that contributes to a broad pool of knowledge domains in plant pathology.