APS Fellows

The Society grants this honor to a current APS member in recognition of distinguished contributions to plant pathology or to The American Phytopathological Society. doi:10.1094/PHYTO-98-1-0019

Charles W. Bacon

Charles W. Bacon was born and raised in Bradenton, FL. He earned his B.S. degree in biology and chemistry at Clark College, Atlanta, GA, in 1965 and his Ph.D. degree in botany (fungal physiology) from the University of Michigan at Ann Arbor in 1972. Between 1972 and 1973, he was a postdoctoral fellow in the Department of Biochemistry at the University of Michigan with A. Greenberg, studying nucleotide biosynthesis in fungi and bacteria. In 1973, Bacon joined the USDA, Agricultural Research Service (ARS), Athens, GA, where he presently serves as the research leader and supervisory microbiologist.

Bacon is an internationally recognized authority in the area of fungal endophytes of grasses, primarily those that belong to the tribe Balansieae (family Clavicipitaceae), and of endophytism in grasses, which now serves as a major focus of numerous research programs worldwide. For more than 26 years prior to his appointment at ARS, scientists had tried to understand why more than 35 million acres of fescue grass grazed in the U.S. midsouth, as well as in New Zealand and Australia, caused so many animal health problems—fescue foot, fescue toxicosis, and other performance problems. Following his arrival at ARS, Bacon developed a hypothesis and implemented a research program to determine the involvement of fungi in the etiology of toxic tall fescue. In 1977, he and associates were the first to document that most tall fescue was asymptomatically infected by an endophytic fungus, which he and his research group later named *Neotyphodium coenophialum*. After this association was established, he discovered that this fungus produced ergot alkaloids, which caused the livestock problems.

These landmark findings provided the impetus for many research groups around the globe to further delve into the many manifestations and implications of the fascinating mutualistic symbioses between *Neotyphodium*/*Epichloe* species and the cool-season grasses. His research activities have dominated most aspects of these associations, including morphology, physiology, ecology, genetic-molecular biology, and evolution of endophytic fungi, as well as pathogenic species of the Balansieae. These plant-pathological and toxicological investigations have led to the biotechnological exploitation of endophytes for improved performance of turf and pasture grasses, with considerable potential for practical developments in the future.

Bacon developed protocols that led to the identification of ergot alkaloids from tall fescue, and these protocols are still used worldwide to assess endophytic infections and the potential for animal toxicity. In addition to his major impact on the study of forage mycotoxins and diseases, Bacon's group also elucidated major positive roles of the endophytes, including enhanced drought tolerance, increased rooting, and greater persistence. These studies provided the foundation for Bacon's lifelong thesis that endophytic fungi are extremely important in plants. His work has also had major practical benefits, such as influencing the creation of the first patented, endophyte-enhanced (yet livestock-friendly) cultivars of turf and forage tall fescue.

Bacon's research is generally concerned with the action and interactions of microorganisms, plants, and animals in agricultural systems. In addition to fescue toxicosis and the Balansieae, Bacon and coworkers have researched many other aspects of plant-endophytic fungi and bacteria. Among the objects of his attention is *Fusarium verticillioides* (synonym *F. moniliforme*), a fungus that infects corn plants and produces fumonisin, a mycotoxin of major concern for food safety and livestock health. Bacon extended the concept of endophytism to include the symptomless *F. verticillioides*–corn association and established that this fungus produces its toxins shortly after infecting the plant seedling. He recently discovered a bacterial endophyte, *Bacillus mojavensis*, which by competitive exclusion can protect corn from such undesirable fungal endophytes, reducing the accumulation of mycotoxins and, thus, the potential for human and livestock poisoning. This bacterium has been patented by ARS.

Bacon has a history of providing service in the area of plant pathology. His expertise with fungal endophytes has led to his participation in national and international consulting and advising teams. He has served several terms as a panelist for the CSREES Biology of Plant–Microbe Interactions Program, has been a member of the Editorial Board of the *Journal of Food Protection*, and has served two terms on the Editorial Board of the *Journal of Applied and Environmental Microbiology*. He is a former member of the International Society of Plant Pathology Committee on *Fusarium* taxonomy. Bacon is an organizer, past chair, and member of the APS Standing Committee on Minorities and Cultural Diversity and the APS Mycotoxin Committee. His outreach activities include mentoring students from minority universities and serving on 1890 Capacity Building grants in plant pathology and mycology. He is a founding member and first treasurer of the International Symbiosis Society. Bacon has mentored several postdoctoral scientists and, as an adjunct professor in the Department of Plant Pathology at the University of Georgia, mentored seven graduate students as their major professor and coadvised ten others.

In recognition of his achievements, Bacon was part of a team who was awarded the USDA Superior Service Award in 1984 for "creative research contributions in finding a cause of fescue grass toxicity and incorporating those findings in a new variety of fescue having great agronomic importance." In 2000, he was awarded the Distinguished Scientist of the Year Award by ARS in recognition of his lifetime efforts and achievements in establishing endophytic microorganisms as basic and applied tools for agricultural research. A fungal grass endophyte, *Epichloe baconii*, was named in recognition of his many contributions to the field of fungal endophytes.

David Glenn Gilchrist

David Glenn Gilchrist was born in Lincoln, IL, and raised on a farm. He graduated from the University of Illinois with a B.S. degree in biological science and an M.S. degree in agronomy. He received his Ph.D. degree in genetics from the University of Nebraska. He joined the Department of Plant Pathology at the University of California, Davis, as a NIH postdoctoral fellow and was appointed to the faculty in 1975.

Gilchrist's research program emphasizes two areas within the general subject of plant diseases and plant–microbe interactions: (i) role and mechanisms of programmed cell death (PCD), or apoptosis, in plant disease; and (ii) genetic regulation and biochemical response of plants to infection. A unifying element across these focus areas is the role of lipid-based signaling and PCD in disease, with particular emphasis on ceramide-related signals as determinants of cellular homeostasis. Gilchrist's research is highly interdisciplinary in scope, requiring an understanding of many rapidly emerging areas in the biology of both plants and animals. He has established productive collaborations with investigators in a variety of biological disciplines, including both plants and animals, fostered in part during his service as associate director of the NSF-supported Center for Engineering Plants for Resistance Against Pathogens (CEPRAP; 1991–2002). The collaborations forged over the years have enabled Gilchrist to expand his research on apoptosis into animal and human biology, with synergies that have enhanced our capabilities for studies of the role of PCD in plant disease susceptibility.

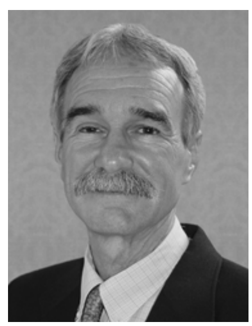
Gilchrist's research on plant–microbe interaction spans 3 decades. He was one of the early proponents of selecting model systems with a solid genetic basis to understand causal mechanisms in plant disease. His training in biochemical genetics, coupled with his postdoctoral research on the regulation of aromatic amino acid metabolism in plants, established a foundation that has guided his pioneering research on the interaction of tomato with *Alternaria alternata* f. sp. *lycopersici* (Alternaria stem canker) and other diseases. Key discoveries include purification and characterization of the host-selective AAL toxin and its congeners, development of sensitive toxin detection methods, characterization of the biochemical and physiological effects of toxin on host tissue, and genetic analyses of toxin action and host response. Gilchrist's research on AAL toxin and the closely related fumonisins produced by *Fusarium verticillioides* are broadly relevant to issues concerning contamination of food products with these mycotoxins in addition to basic research on PCD in plants and animals triggered by toxins. Other important research endeavors have included studies on the genetics, physiology, and biochemistry of diseases of alfalfa, notably characterization of the interaction of alfalfa with *Stemphylium botryosum* and a toxin secreted by this pathogen. Related to these basic studies were collaborative efforts with breeders to identify and introgress genetic resistance to diseases of tomato, alfalfa, and wheat into commercial germplasm. These projects resulted in the release of spring wheat cultivars with resistance to Septoria leaf blotch and the release of several germplasm lines with high levels of resistance to Stemphylium leaf spot and Stagonospora crown rot in alfalfa. His efforts included the identification of the *Asc* gene in tomato conferring resistance to Alternaria stem canker, a disease that initially threatened the fresh-market tomato industry in California. Nearly all fresh-market tomato lines grown in California now carry the *Asc* gene and have been free of Alternaria stem canker for more than 2 decades.

A seminal contribution is the discovery by Gilchrist and his colleagues demonstrating PCD with hallmark features of apoptosis in plants, a process extensively studied and documented in animals. AAL toxin, fumonisin, pathogens, and certain chemical agents were shown to kill plant cells by the PCD process, providing the first evidence that apoptosis was functionally conserved across the two kingdoms as a basic process fundamental to both disease and development in plants. The research also pointed to the participation of a ceramide-linked signaling pathway in the triggering of PCD, a first in plant biology, and revealed that these same toxins could trigger the equivalent process leading to death in animal cells. This research provided strong evidence for a general role for PCD in plant disease, which has profoundly influenced thinking about plant pathogenesis, particularly in necrotrophic interactions. The research is provocative in that it suggests opportunities for engineered disease resistance by targeting PCD. Gilchrist has challenged traditional views on the functional role of cell death in resistance as observed in the hypersensitive response, an issue articulated in reviews and opinion papers. He is now applying principles and screening methods developed in the tomato model to identify genes in grape that block disease symptoms of Pierce's disease caused by *Xylella fastidiosa*.

Gilchrist's research accomplishments are well recognized. He was honored as a distinguished scholar at Vriji Universiteit, Amsterdam (1993); the E.S. Luttrell Memorial Lecturer, University of Georgia (1997); the Rosie Perez Memorial Lecturer, North Carolina State University (1999); a fellow, American Association for the Advancement of Science (AAAS, 2001); and a distinguished scientist, University of Western Australia (2002).

Gilchrist has contributed extensively in teaching, service, and outreach, including substantive contributions to APS directly or through programs that impact APS and its membership. He has been the APS affiliate representative to AAAS from 2001 to 2007. He is highly regarded as a teacher and has mentored a number of graduate students in plant pathology and other disciplines who have gone on to successful careers. He is an accomplished speaker with a knack for capturing the essence of an issue in a clever phrase that helps his audience identify and retain the salient points. His outreach efforts deserve special note. As director of the NSF-funded Partnership for Plant Genomics Education (PPGE), he and his staff have developed novel educational software for introducing biotechnology to high school biology students, with an overall national contact of more than 5,000 schools in the past 10 years. PPGE also developed and supports a widely recognized "Biotechnology in the Classroom" curriculum and laboratory kit loan program. Over the past decade, 30,000 northern California area students have used these hands-on biotechnology exercises not otherwise accessible at the local school level.

James H. Graham, Jr.



James H. Graham, Jr. grew up near Philadelphia, PA, and received his B.S. degree in biology from the University of California, Irvine. Subsequently, he received his Ph.D. degree from Oregon State University in 1980, working on ectomycorrhizal symbiosis and soilborne diseases. Later, he spent 2 years as a postdoctoral fellow with John Menge, investigating arbuscular mycorrhizal fungi at the University of California, Riverside. In 1981, he was appointed assistant professor of soil microbiology at the University of Florida, Citrus Research and Education Center (CREC), and he was promoted to full professor in 1991.

His initial assignment was to investigate the etiology of citrus blight. He contributed to the evaluation of soil organisms in relation to that disease, to the development of diagnostic tests for the disease, and to the eventual demonstration of graft transmissibility of blight.

Graham developed an extensive program on *Phytophthora* diseases of citrus early in his career. One of his major contributions, along with L. W. Timmer, was the development of a quantitative assay for soil populations of *P. nicotianae* that allowed determination of the effect of root rot on yields of citrus. He discovered that *P. palmivora* was a major pathogen in Florida and elucidated its role in brown rot of fruit and in a serious decline disease associated with the root weevil, *Diaprepes abbreviatus*. Graham investigated that decline and showed that it resulted from a complex of insect larval feeding, causing severe structural root damage with rapid tree loss in the presence of *P. palmivora*. The discovery that trifoliate orange and hybrids, such as Swingle citrumelo, were susceptible completely redirected the efforts of rootstock development programs. Graham currently is working with the plant improvement teams of the University of Florida and USDA to discover and evaluate new sources of resistance.

Throughout his career, Graham has maintained a program on mycorrhizal fungi, emphasizing the costs and benefits to the host. In collaboration with D. M. Eissenstat, he developed methods to study the interactions of phosphorus supply and mycorrhizal fungi on the carbon economy of citrus. Genotypic control of root colonization in relation to carbohydrate supply to the fungus was defined and the basis for growth depression of citrus at high phosphorus supply was assessed. They defined "aggressiveness" of mycorrhizal fungi as the rate of root colonization and found that higher colonization rates predicted increased phosphorus uptake and greater carbon cost of fungal genotypes. They were the first to demonstrate the carbon cost of mycorrhizae in the field. They were also the first to study mycorrhizal effects on the ecophysiology of roots of mature trees and reveal that mycorrhizae increase root longevity in dry soils. With several collaborators, Graham explored the broader implications from cost/benefit analyses in relation to the functioning of mycorrhizae at high nutrient supply in wheat, vegetables, and sugarcane.

When citrus canker was discovered in the mid-1980s, Graham redirected his program and made major contributions to research on *Xanthomonas axonopodis* and served in an advisory role to regulatory agencies and the citrus industry. In the early years, he was instrumental in characterizing citrus bacterial spot, a nursery disease that was confused with canker and resulted in the eradication of many nurseries. His work led to the discontinuation of eradication for that disease. He cooperated with the Citrus Canker Eradication Program (CCEP) and conducted research and provided information aimed at improving control and eradication of canker. Graham collaborated with T. R. Gottwald and CCEP to demonstrate that the 125-ft eradication radius was inadequate to suppress the spread of citrus canker. As a result, a new regulation, the "1900-ft rule", was put into practice in late 1999. Eventually, the eradication program proved to be unsuccessful after several hurricanes in 2004–2005, and Graham now has developed programs to manage canker by regulatory means and by the use of windbreaks and copper bactericides. He was a leader of the Citrus Health Response Plan and worked with nurserymen and growers to revamp the citrus nursery industry in Florida from the field to indoor production to produce trees free of canker and greening disease.

In addition, Graham has made contributions to the characterization of the canker pathogen and to molecular diagnostic techniques. Existing sets of polymerase chain reaction (PCR) primers were inadequate for the detection and identification of certain canker strains. Graham and J. Cubero, a postdoctoral associate from Spain, designed and applied new primers that detect all canker strains. A novel protocol utilizing rep-PCR elements was applied to identify the genotypes present in outbreaks of canker in Florida and worldwide. Genotype identification of Florida strains has been used for tracking and risk assessment in existing and new outbreaks of canker. Three genotypes were discovered, indicating that separate introductions of the disease have occurred over the last 20 years and that most of the new outbreaks of canker were due to spread of the Miami strain introduced in 1995.

His research program has been well funded and he has received about $7.5 million in grants from USDA CSREES and more than a million dollars from the citrus industry and commercial sources. Graham has contributed to the profession in many other ways as well. He served as an associate editor of *Phytopathology*, held editorial posts with *Plant & Soil* and *New Phytologist*, and is currently an editor for APS PRESS. Graham received the Lee Hutchins Award several years ago for his contributions to the understanding of canker and bacterial spot. Graham contributes greatly to CREC, the University of Florida, and to the citrus industry of Florida and worldwide. He has trained several Ph.D. and master's students and frequently receives visiting scientists, students, and citrus growers from other countries seeking training and information. He travels extensively to present talks at meetings and to provide advice to citrus growers nationally and internationally. Graham is an exceptional research scientist who has distinguished himself by his research in diverse areas in plant pathology and soil microbiology. He is a renowned expert on citrus canker who is looked to by colleagues, regulatory agencies, and citrus growers in Florida and elsewhere for advice on the establishment of regulations and practices for disease management.

Raymond Hammerschmidt

Raymond Hammerschmidt was born in Oak Park, IL, in 1952. He received a B.S. degree in biochemistry (1974) from Purdue University. As an undergraduate in the laboratory of Joseph Kuć, he was involved in some of the first research on induced resistance in cucumber. In 1976, he received his M.S. degree in plant pathology from Purdue University under the direction of Ralph L. Nicholson. He went on to the University of Kentucky, where he received his Ph.D. degree (1980) in plant pathology under Kuć. He credits both of his graduate mentors for instilling in him the value of utilizing both fundamental and applied research and the importance of good teaching. In 1980, Hammerschmidt was appointed as an assistant professor in the Department of Botany and Plant Pathology at Michigan State University (MSU) and was a full professor by 1991. He then became the acting chair of botany and plant pathology at MSU in 1999. Two years later, the MSU Board of Trustees approved a new Department of Plant Pathology and appointed Hammerschmidt as its first chair. This is the first time in recent memory that a Department of Plant Pathology has been created from a broader academic unit. Hammerschmidt also serves as coordinator of MSU Diagnostic Services and director of the North Central Plant Diagnostic Network and has had significant impact on development of the National Plant Diagnostic Network since its inception.

Hammerschmidt has conducted truly outstanding research pioneering the field of induced resistance of plants to fungal and bacterial pathogens. For example, from the mid-1970s to the early 1980s, he (together with Kuć and others) developed the induced resistance system in cucumber for systemic acquired resistance (SAR) studies. He and his coworkers determined by genetic and molecular approaches that pathogen-induced necrosis is essential for the induction of SAR. He was also the first to provide data that salicylic acid was probably not the mobile signal for SAR. Hammerschmidt and coworkers characterized the phytoalexin camalexin from *Arabidopsis* and conducted many of the first biosynthetic studies of this phytoalexin. Using both field and laboratory approaches, he and his coworkers demonstrated that protoporphyrinogen oxidase inhibitor herbicides induced resistance in soybean to *Sclerotinia sclerotiorum* and provided a biochemical explanation for this phenomenon. Hammerschmidt has conducted many studies demonstrating that multiple types of cell wall alterations are part of a plant's active response to pathogens. In addition to Hammerschmidt's many publications in the above areas, in 2000, he coorganized the First International Symposium on Induced Resistance, held in Greece.

Through a long-standing cooperation with the MSU potato-breeding program, Hammerschmidt has been instrumental in developing disease-resistant varieties. This cooperation is reflected in the large number of publications in this area. In addition, he has provided leadership for many extension-related activities in support of phytopathology and the new department. For example, he and his coworkers have produced extension bulletins on potato and soybean diseases. He has been involved in homeland security through several national and local committees and is responsible for coordinating the Michigan soybean rust sentinel plots.

Hammerschmidt has served phytopathology through editorial responsibilities for *Phytopathology* (associate editor), APS PRESS (senior editor), and *Physiological and Molecular Plant Pathology* (senior editor and editor-in-chief). He has also been councilor and president of the North Central Division of APS. He has served on several USDA (Plant Pathology/Weed Science and IPM) and NSF research grant panels and on numerous internal MSU grant panels. Hammerschmidt has also been a member of highly significant MSU search committees, including those for the director and associate director of the Michigan Agricultural Experiment Station, dean of the Graduate School, assistant provost for Graduate Education, director of MSU Extension, associate director of MSU Extension Programs, and associate director of MSU Extension Operations. In addition, he has chaired two, and served as a member of three, departmental faculty search committees.

Hammerschmidt currently teaches PLP 101 Issues in Plant Pathology, PLP 405 Plant Pathology, and PLP 881 Biochemical and Molecular Plant Pathology. He is an enthusiastic and tireless instructor and his student ratings reflect this.

Hammerschmidt has been major professor for ten Ph.D. and five M.S. students and currently advises two M.S. students. Hammerschmidt has served as an external examiner for Ph.D. candidates in other countries, including Australia and Canada. He has mentored nine postdoctoral research associates and has been a member of 62 graduate committees in eight departments. In addition, Hammerschmidt has been a mentor or supervisor for the High School Science Program, DREAMS Program, Minority Summer Research Program in Plant Sciences, and Michigan Science Olympiad.

Throughout his career, Hammerschmidt has focused mainly on fundamental research. Nevertheless, he has also maintained significant activities in applied phytopathology, academic instruction, outreach, and service. He is a truly complete twenty-first-century plant pathologist! This balance of interests is reflected in his many publications, which include peer-reviewed papers (75), extension and related publications (14), technical articles and research reports (78), books and book reviews (5), invited reviews and papers (30), and editorials (29). He has also given numerous invited presentations (120) at national and international meetings, various U.S. and foreign universities, and commodity and growers groups on numerous topics spanning his wide range of expertise. Hammerschmidt continues to conduct full research and teaching programs in addition to his administrative duties as chair in the Department of Plant Pathology at MSU.

Rosemarie Wahnbaeck Hammond

Rosemarie Wahnbaeck Hammond was born July 13, 1953, in Houston, TX. She received a B.S. degree in botany from Miami University, Oxford, OH, in 1975. She then earned M.S. (1977) and Ph.D. (1981) degrees in botany from the University of Tennessee, Knoxville. After postdoctoral positions at Purdue University and USDA Agricultural Research Service, Hammond joined the Molecular Plant Pathology Laboratory, ARS, USDA, Beltsville, MD, as a research plant pathologist in 1988.

Hammond's research career began by studying regulation of the biosynthetic pathways leading to synthesis of lysine, threonine, and methionine in corn and spinach. In 1979, Hammond found that the enzyme that catalyzes the first, and the rate-limiting step in the pathway, is localized in the chloroplast, thus providing new insight into biological constraints on storage protein synthesis and quality.

As a postdoctoral research associate in the Department of Botany and Plant Pathology at Purdue University, Hammond studied the Bowman-Birk trypsin inhibitor protein of soybean seed. She successfully obtained and sequenced the first cDNAs corresponding to the gene for this inhibitor. This protein functions in protecting plants from microbial invasion and may serve as a site of sulfur storage in the seed.

Hammond then changed research emphasis and began her career in plant pathology at the University of Maryland and USDA. Hammond worked with Ted Diener and Robert Owens and became recognized as a national and international authority on the structure and function of viroids, unique phytopathogenic RNA molecules that encode no proteins. Hammond's creative application in 1987 of site-directed mutagenesis to study structure/function relationships in *Potato spindle tuber viroid* resulted in the discoveries that certain single-site mutations can render an infectious viroid nonviable and that other mutations may change symptoms elicited in hosts or may alter movement or cell-specific replication of the viroid. Her discovery in 1989 of a naturally occurring chimeric viroid and of alternate cleavage sites that exist within the viroid molecule proved conclusively that intragenomic RNA recombination is involved in viroid evolution. In 2000, Hammond discovered that viroid infection induces the synthesis of a host protein kinase, opening the way for studies of the kinase's involvement in signaling pathways leading to symptom induction in diseased plants. These landmark discoveries contributed fundamental new understanding of the complex genomic and structural determinants of viroid replication and disease induction, and they opened avenues for novel strategies to engineer useful viroid disease resistance in plants, a critically important step since no conventional genetic resistance to viroids is known.

While making pioneering advances in fundamental understanding of viroids and the diseases they induce, Hammond has also addressed a series of practical problems. For example, she molecularly characterized numerous viroids associated with diseases of international importance, including citrus B viroid in Italy and Indian bunchy top disease of tomato, and with collaborators, discovered citrus viroids and *Potato spindle tuber viroid* in the principal citrus and potato production regions of Costa Rica, pointing out the need to develop certification programs for these crops.

Hammond also demonstrated strength and versatility by applying her expertise and originality, nationally and internationally, to molecular characterization, detection, strain differentiation, and understanding of the evolution of two agronomically important plant viruses, *Prunus necrotic ringspot virus* (PNRSV) and *Maize rayado fino virus* (MRFV). She developed the earliest nucleic acid probes for diagnostic use, and she identified and characterized the coat protein genes of these viruses for use in engineering disease-resistant plants. Her design of a polymerase chain reaction-based assay for pathotype differentiation of PNRSV strains advanced disease control. With colleagues, her molecular analysis of MRFV, which causes significant yield losses in maize throughout Central and South America, demonstrated distinct evolutionary lineages in Latin America. In 2001, she determined the complete nucleotide sequence of the MRFV genome, providing fundamental new knowledge of the virus as well as molecular tools to engineer resistance to MRFV in maize. In conjunction with these contributions, Hammond and collaborators at the University of Costa Rica identified two *Zea mays* accessions with resistance to MRFV, providing critical germplasm for maize breeding programs in the Americas.

Recently, Hammond led the design of novel plant virus-based gene vectors, which she and colleagues R. A. Owens and Y. Zhao have utilized to demonstrate nuclear targeting of PSTVd RNA molecules. This advance provides unique insights into cellular pathways that viroids harness for movement in plants, opening the way to understanding RNA trafficking in healthy plants.

In recent achievements beyond plant pathology, Hammond also led research that developed virus-based vectors as novel epitope display systems for vaccine production, for creating a complementation system to express and evaluate disease resistance genes, and for producing a biologically functional bovine protein for treatment of mastitis. This pioneering technology provides safe and affordable pharmaceutical products and alternative value-added agricultural products.

Hammond's achievements demonstrate a career-long dedication to advancing knowledge in plant physiology and plant pathology through personal and team research. During the past decade, she initiated national and international collaborations and trained numerous U.S. and foreign visiting scientists, who were attracted to share her creative insights. In recognition of her accomplishments, Hammond has been invited as a U.S. and international consultant for IAEA and US AID, served as principal plant pathologist at USDA CSREES, and delivered many invitational seminars at national and international meetings. She has authored or coauthored 99 papers in referred journals, reports, reviews, and book chapters and has coauthored three invention disclosures and a patent application. Hammond served as member and vice chair and is currently chair of the APS Virology Committee and has organized and chaired special sessions at APS annual meetings. She served as associate editor for *Plant Disease*, is adjunct professor at the Center for Biosystems Research of the University of Maryland Biotechnology Institute, and is frequently sought to review grant proposals and manuscripts for APS and other professional scientific journals.

Nancy Keller

Nancy Keller was born in Bellafonte, PA, and received her undergraduate degree in biological sciences from Pennsylvania State University in 1977. Between 1978 and 1981, she served in the Peace Corps in Lesotho, Africa; it was an experience that left a lasting impression, shaping the direction of her scientific career. She then did graduate work, receiving both her M.S. and Ph.D. degrees in plant pathology from Cornell University, the latter in 1990. Following postdoctoral work in genetics, she became a faculty member at Texas A&M University and, subsequently (since 2001), at the University of Wisconsin, where she is a professor of plant pathology. She has received numerous awards and honors, most recently fellow of the American Association for the Advancement of Science and the University of Wisconsin Mid-Career Kellett Award.

Keller is an internationally preeminent fungal biologist, with particular expertise on toxigenic fungi and the mycotoxins they produce. Her research focus lies in genetically dissecting those aspects of *Aspergillus* spp. that render them potent pathogens and superb natural product producers. Her interest in this topic stems from a seminal graduate school presentation by the late Paul Nelson on what was then a newly described mycotoxin, fumonisin, implicated as causing esophageal cancer in the South African population. As noted above, she had served as a Peace Corps volunteer in this region of the world and had direct experience with molded food supplies; hence, this seminar hit home at both a personal and intellectual level.

Although originally focused on the regulation of mycotoxin gene expression in *Aspergillus* spp., her laboratory's research has expanded to include elucidation of fungal sporulation and host/pathogen interactions—processes intimately linked to secondary metabolite (e.g., mycotoxin) production. Her approach has been to use the genetic model *A. nidulans* to elucidate important biological processes in this genus and then to apply this information to the plant pathogens *A. flavus* and *A. parasiticus* and, more recently, to the human pathogen *A. fumigatus*.

Keller, along with her associates at Madison and elsewhere, has made seminal discoveries in several areas of fungal biology. A broad realm relates to the genetic regulation of secondary metabolism and the role of toxic metabolites in fungal virulence. Within this realm, her contributions cluster in four topics. The first is with respect to clustering of biosynthetic genes. Initial genetic analysis suggested that most of the genes involved were not linked but scattered throughout the genome. The 1996 PNAS publication by Keller and colleagues of the sterigmatocystin/aflatoxin (ST/AF) gene cluster was one of the instrumental contributions to this field and remains a highly cited paper to this day. Subsequent papers involved characterizing biosynthetic genes involved in ST/AF biosynthesis.

A second thrust relates to genetic linkage of sporulation and secondary metabolism through a shared G protein/cAMP/protein kinase A cascade. An association between natural product formation and fungal morphological development has been observed for decades. Her laboratory contributed to the finding of the first genetic evidence for linkage of secondary metabolism and sporulation through a G protein/protein kinase A (PkaA) signal transduction pathway. Further biochemical work established PkaA as a key regulator of AflR at both the transcriptional and posttranscriptional level.

The third area pertains to epigenetic control of secondary metabolite gene clusters. Through complementation of a ST mutant, Keller and colleagues found an *A. nidulans* gene, *laeA* (loss of aflatoxin expression), required for the production of multiple secondary metabolite gene clusters, including ST and AF, the antibiotic penicillin, the virulence factor gliotoxin, and the cholesterol-lowering drug lovastatin. LaeA is a novel protein methyltransferase most similar in sequence to histone methyltransferases. The protein is functionally conserved in *Aspergillus* spp. and has been identified in most filamentous fungi. LaeA may regulate secondary metabolism gene clusters by activating facultative heterochromatin. Keller and colleagues also suggest that LaeA-mediated chromatin regulation of secondary metabolism gene clusters may enable filamentous fungi to exploit environmental resources by modifying chemical diversity. This work presents a new paradigm in toxin gene evolution and presents a critical advance in uncovering a unique mechanism of niche specialization and adaptation in opportunistic pathogens.

The fourth area within the domain of secondary metabolism is the role of LaeA in *A. fumigatus* virulence. One of the metabolites regulated by LaeA in *A. fumigatus* is gliotoxin, an apoptotic factor implicated as a major virulence factor in this human pathogen. Keller's group found that the *laeA* deletion strain was greatly attenuated in virulence. The loss of virulence was associated with an increased ability of macrophage to engulf the mutant conidia and a decreased ability of the mutant to kill neutrophils.

Keller has also made significant contributions in two other broad realms of fungal biology. The first is in the role of RNA interference in gene silencing, where Keller and colleagues showed that endogenous RNAi machinery silences aflatoxin biosynthesis in *A. flavus* and *A. parasiticus*, trichothecene production in *Fusarium graminearum*, gliotoxin in *A. fumigatus*, and ST biosynthesis in *A. nidulans*. Second, she has begun work on host/fungus signaling with studies on oxylipins, which are ubiquitous signaling molecules produced by both prokaryotes and eukaryotes. Keller's central thesis is that fungi and their hosts recognize and respond to each others' oxylipin signals. This project arose from her insight that plant defense oxylipins shared structural similarities to endogenous *Aspergillus* sporulation factors.

Related to her stellar research, Keller travels widely as an invited university lecturer and conference speaker or organizer (most notably as forthcoming chair of the fungal biology Gordon Conference, 2008). She has received uninterrupted, extensive competitive funding for her program, served on numerous editorial boards and grant panels, and mentored numerous students at all levels in her laboratory. These illustrious achievements have occurred against a background of significant and accomplished classroom teaching and university service.

Steven A. Lommel

Steven A. Lommel was born August 6, 1956, in Modesto, CA. He completed his B.S. degree in biology at the University of San Francisco in 1978. He went on to do his graduate work in the Department of Plant Pathology at the University of California-Berkeley supported on a William Carroll Smith Fellowship. He completed his M.S. degree in 1981 and his Ph.D. degree in 1983 under the direction of T. Jack Morris. His master's research resulted in publications describing one of the first applications of indirect ELISA for routine detection of plant viruses. His Ph.D. research on the comparative virology of plant and insect viruses resulted in one of the first papers on the molecular characterization of an insect nodavirus. Upon graduation, he was appointed assistant professor of plant pathology at Kansas State University, where he was awarded a prestigious Ciba/McKnight Foundation Fellowship. In 1988, he moved to the Department of Plant Pathology at North Carolina State University (NCSU), quickly rising through the ranks to associate professor in 1991 and full professor in 1995. In addition to his research and teaching duties in the Department of Plant Pathology, he concurrently held split appointments as assistant director of the North Carolina Agricultural Research Service (1992–2001) and then as associate vice chancellor for research (2001–2002). He is currently a professor of plant pathology and genetics.

Lommel is recognized internationally for his research contributions to plant virus pathogenesis, evolution, taxonomy, and assembly. He is perhaps best known for his molecular characterization of *Red clover necrotic mosaic virus* (RCNMV), making this member of the plant dianthoviruses among the best characterized of any bipartite RNA plant virus. His research has resulted in this system being one of the premier models for understanding the process of virus cell-to-cell movement. He has published more than 10 papers describing the structure and function of a viral protein responsible for moving virus RNA from cell to cell. These contributions have helped to change our fundamental understanding of plant viral pathogenesis. His *Plant Cell* paper has been cited more than 150 times. His research on RCNMV RNA interactions has led to a second paradigm-shifting body of research with the discovery of a novel mechanism of RNA-mediated transcriptional regulation. In a series of papers, highlighted by his highly cited 1998 *Science* publication, he demonstrated that in trans RNA interactions are involved in RCNMV gene regulation. This discovery has broad implications in biology and provides an important evolutionary precedent supporting the RNA origin of life theory. Most recently, he extended the importance of the phenomena of in trans RNA interactions, showing their role in virus assembly of multiple RNAs within a single virus particle.

Lommel's laboratory has also established collaborations that are providing fundamental contributions to the study of virus structure and assembly using the RCNMV model system. His presentations at recent meetings have elegantly described one of the few high-resolution structural analyses showing the specific location and interaction of RNA within an isometric virus particle. These experiments have pioneered innovative collaborative studies by his laboratory examining use of RCNMV as a nanoparticle engineered to target specific cancer cells to deliver therapeutic agents.

Lommel is also codirector of the Tobacco Genome Initiative, a privately funded genomics research program at NCSU focused on sequencing the tobacco genome. Through his vision and leadership, an international *Nicotiana benthamiana* working group was also created. The establishment of this large collaborative effort to sequence expressed genes has resulted in the definition of some 15,000 genes that will soon be available on chips for gene expression array analysis. This will become a hugely valuable genomic tool because *N. benthamiana* has emerged as a model system of choice for studying host–pathogen interactions by many plant virologists and other plant pathology researchers interested in disease resistance mechanisms. His leadership on this project has brought knowledge and resources together to make this model plant of tremendous value to the scientific community as a whole.

Lommel has an exemplary record of university and professional service. He was the assistant director of the North Carolina Agriculture Research Service in the College of Agriculture and Life Sciences from 1992 to 2001. He currently serves as the assistant vice chancellor for research and graduate studies with responsibility for helping coordinate research programs between life sciences and agriculture. He also serves as a special scientific advisor to the U.S. EPA on the release of transgenic crops and on numerous university, state, federal, and international scientific boards, committees, and funding panels. He has served in numerous editorial capacities, is currently an editor of *Virus Research*, and has served on the editorial boards of *Phytopathology*, *Molecular Plant–Microbe Interactions*, and *Virology*. He also contributes significantly to the plant virus community, serving as chair of the APS Virology Committee, convener of numerous sessions at meetings, and chair of the ICTV *Tombusviridae* subcommittee for over a decade.

Lommel has an excellent record in teaching. He has contributed to several general plant pathology, biotechnology, and graduate-level virology courses. His teaching of the summer biotechnology courses in particular and his advanced molecular virology course have been very well received by students. He has trained numerous graduate students (17) and postdoctoral associates (11), most of whom have gone on to careers as professional scientists in industry and academia.

Lommel's accomplishments in research, teaching, and service are outstanding. He has more than 100 peer-reviewed publications and holds three patents. His elucidation of the molecular mechanisms of plant viral movement proteins and the identification of the first RNA–RNA interaction regulating gene expression are widely recognized as outstanding contributions, earning him international respect in the plant virology community. His current research on virus structure and assembly is both unique and innovative and could potentially lead to practical applications of the use of plant viruses as nanocargo vessels for delivery of therapeutics to cancer cells.

Matteo Lorito

Matteo Lorito was born in Salerno, Italy, in 1961. In 1988, he received his doctorate in biology cum laude at the University of Siena. From 1988 to 1990, he was a research fellow of the Italian National Council of Research (CNR). From 1990 to 1993, he was a visiting fellow at Cornell University. Subsequently, he became assistant, then associate, and finally full professor of plant pathology at the University of Naples and adjunct research scientist at CNR.

Lorito initiated his innovative scientific career in plant pathology working at Cornell University in collaboration with Gary Harman. While at Cornell, he codiscovered and characterized a number of enzymes and genes that regulate the biocontrol activity of *Trichoderma* spp. by degrading the cell wall of phytopathogenic fungi. He developed a new method to genetically modify these biocontrol microbes by using biolistic transformation. He also discovered a variety of synergistic interactions of the *Trichoderma* hydrolytic enzymes with other microbes and chemical pesticides, thus introducing the application of these fungal molecules as general antifungal agents.

Upon his return to Italy in 1994, the objectives of his program have diversified to cover a variety of topics, from basic understanding of biocontrol mechanisms to practical applications of beneficial microbes. One of the main accomplishments was to demonstrate that plant disease resistance can be transgenically increased by using fungal biocontrol-related genes, such as those encoding *Trichoderma* chitinases and glucanases. Since this pioneer work, numerous other laboratories have applied the same technology to a variety of different crops, generating, for instance, a new variety of rice resistant to fungal pathogens expected to be marketed in China next year.

He made some key discoveries that allowed a significant advancement in the understanding of the fundamental interactions between beneficial fungi, plants, and pathogens. These include the demonstration of the key role of chitinases and glucanases in *Trichoderma* biocontrol interactions, the identification of bioactive and signaling molecules that activate antagonistic mechanisms and plant response to these fungi, the discovery and characterization of biocontrol-related promoters and their use to develop nondisruptive reporter systems for the detection of gene expression and to monitor disease control activity, the genetic improvement of *Trichoderma* strains to increase their beneficial effects on crops, and the identification of novel factors involved in the three-way interaction (*Trichoderma*–plant–pathogen) by using a holistic approach based on proteome analysis. His discoveries have made him an internationally recognized expert on *Trichoderma* and biocontrol. He has contributed to the current new understanding of the mechanisms of action of these beneficial microbes, used worldwide as biopesticides, by demonstrating that the direct effects of these fungi on plants is at least as important as their direct effects on pathogens via antibiosis, mycoparasitism, and other mechanisms.

He has also made significant contributions to industrial biotechnology, mainly but not only in biocontrol science and plant pathology. By applying the current understanding that he partially generated on biocontrol interactions, he has selected new fungal agents with improved efficacy against a wider range of pathogens and the ability to induce plant systemic resistance as well as promote plant growth, nutrition, and yield. He also developed new biopesticide formulations based on antimicrobial and synergistic properties of antifungal enzymes and metabolites produced by selected *Trichoderma* strains. He applied a similar enzyme-based technology to improve the dietary fiber contents of cereal products and, thus, their digestibility for use in human food, commercialized by a major pasta and bread company.

He has developed cooperative projects around the globe, ranging from Europe to China to North and South America. His program has been awarded in the last decade about eight million euro in grants from both national and foreign agencies. This is a tribute both to his research skills and to the regard with which his collaborators hold his expertise and cooperative attitude. He has published about 90 papers in reviewed journals (about 300 when including abstracts) and about 20 book chapters and has authored 14 patents and patent applications. Many of his papers are in high-impact-factor journals, including *Proceedings of the National Academy of Science of USA*, *Nature Reviews Microbiology*, and *Molecular Plant–Microbe Interactions*. Additionally, he is involved in the startup of several companies in the United States and in Europe.

At his university, he is teaching, or has taught, graduate or undergraduate courses in plant pathology, physiological plant pathology, biotechnology applied to plant pathology, laboratory of plant protection, novel methods of disease control, and pathogenic and beneficial microbes in agriculture. Moreover, he has tutored more than 40 Ph.D. and bachelor theses in plant pathology and served as a tribunal member of several Ph.D. theses in Europe. He is the head of exchange and international cooperative programs or commissions, senior editor of the annals of the faculty of agriculture, and on the Board of Directors of the Ph.D. program in agrochemistry and agrobiology.

He serves APS in the *Phytopathology News* Advisory Board and the Biological Control Committee. He is a member of the International Society for Molecular Plant-Microbe Interactions (IS-MPMI) and served as editor for Europe of the *IS-MPMI Reporter*. He is now an associate editor of the *Molecular Plant–Microbe Interactions* journal. He is on the Board of Directors of the Italian Plant Pathology Society and chair and organizer of the 13th International Congress on Molecular Plant–Microbe Interactions to be held in Sorrento, Italy, in 2007.

Lorito also has been awarded several honors, including a Fulbright fellowship for research, a fellowship from the OECD (Organization for Economic Co-operation and Development), and a lecturer scholarship from the Lecturer Program of the U.S. Council for International Exchange of Scholars. He has been invited as a speaker or chair in more than 100 congresses, seminars, and other occasions, including being a chair, invited, or plenary speaker in the last four editions of the International Congress of Plant Pathology. His expertise in the fields of biocontrol, plant pathology, and biotechnology is frequently requested from various journals and granting agencies to review papers and proposals.

William E. MacHardy

William E. MacHardy is a native of Maine. He obtained his B.S. and M.Ed. degrees in 1958 and 1965, respectively, from the University of Maine, his M.S. degree in biology from the University of Nebraska at Omaha in 1966, and his Ph.D. degree in plant pathology from the University of Rhode Island in 1970, where he worked with both Frank Howard and Carl Beckman. He joined the faculty of the University of New Hampshire (UNH) in 1972, was promoted to associate professor in 1977 and to professor in 1985, and was appointed professor emeritus in August 2001.

MacHardy was already an accomplished and respected researcher on water relations in vascular wilt diseases when he arrived at UNH. He was known for his keen perception of knowledge gaps that impeded progress in research and its application; a theme to which he often returned throughout his career. The reviews, book chapters, and papers he authored with Carl Beckman and Robert Hall are still relied upon in teaching and research. In 1978, he refocused his research on the epidemiology and management of apple scab, the most destructive disease of apples worldwide, and it is for this that he is perhaps best known today.

Commercially relevant control of scab had always required intensive spraying to prevent infection by ascospores, which overwinter in pseudothecia on fallen infected leaves. Intensive spraying continued until it was assumed that the ascospore supply was exhausted. However, no accurate, practical method existed by which this event could be forecasted over a large geographic area. MacHardy directed a series of studies that relentlessly generated the knowledge base to fill this gap. An improved method was developed to assess the maturity and discharge of ascospores (Phytopathology 72:92-95). The method was adopted by IPM programs in the United States and elsewhere and was continually improved (Plant Dis. 76:277-282 and 76:717-720). A model developed to estimate ascospore maturity based upon degree-day accumulation was validated by additional field studies (Phytopathology 72:901-904). The model was linked to weather forecasts to produce a true forecasting model to predict inoculum maturity up to 1 month in advance (Phytopathology 75:381-385). This simple, user-friendly model has been repeatedly validated, refined, and adapted (Plant Dis. 88:869-874); it has been translated and described in French, Italian, German, Spanish, and Portuguese; and variants exist within nearly every apple IPM program worldwide.

The Mills Infection Period Table for apple scab was a widely used but flawed method of identifying conditions for infection. Many had tried to either validate or refine its predictions with varied results. MacHardy initiated a 4-year orchard study in which he demonstrated that ascospore release by *Venturia inaequalis* was suppressed during nighttime hours (Phytopathology 76:985-990). Unknown to Mills, this caused daytime infection times to be substantially overestimated, i.e., infection occurred in less time than was specified in the Mills Table. MacHardy's results were subsequently validated in several laboratory and field studies in the United States and Europe. His revised infection period table is now used worldwide and has more closely aligned the use of fungicides to the risk of infection.

The above work dealt with relative inoculum levels, i.e., that proportion of a pathogen population that was mature or had been discharged. However, decisions based upon relative inoculum potential presuppose the existence of a pathogen population sufficiently dense to cause significant disease in the absence of control. The relationship between absolute inoculum potential, or inoculum dose, and disease development had never been comprehensively investigated for apple scab. MacHardy recognized the impact of this gap in our knowledge (Prot. Ecol. 5:103-125) and directed studies that ultimately were among the first to apply Van der Plank's equations for the practical timing of fungicide sprays. A system to forecast inoculum dose in commercial orchards used measurements of disease incidence and leaf litter (Phytopathology 76:112-118). From these simple measurements, an accurate forecast of inoculum dose was generated and used to determine how long the fungicide spray program could be delayed the following spring. The increased flexibility that this created in fungicide schedules allowed them to be integrated with insect and mite sprays. This work stands as an excellent example of the integration of disease and insect management programs for multiple pest systems (Plant Dis. 73:98-105 and 77:372-375). It furthermore served as the basis for MacHardy's present work in orchard sanitation (Plant Dis. 84:1319-1326) as a means to augment control of apple scab. Long considered an intractable and classic "compound interest" disease, sanitation was widely regarded as an inefficient and impractical tactic against scab. MacHardy's pragmatic combination of a seemingly outdated tactic of leaf litter removal with some otherwise arcane mathematics produced a workable and valuable solution to address the problem of eroding fungicide performance in commercial orchards. The simplicity and elegance of his solutions to such problems often belies the intense study and hard work involved in their creation.

MacHardy devoted nearly 10 years of his career to writing his book *Apple Scab: Biology, Epidemiology, and Management* for APS PRESS. With typical thoroughness and dedication, he collected and critically reviewed the thousands of journal papers, experiment station reports, and extension bulletins published on apple scab during the last century and synthesized new and valuable concepts and applications in the process. He traveled worldwide to personally interview authors and to have each chapter of the book reviewed by leading scientists in their respective areas of expertise. His book is recognized as the single most comprehensive treatment ever published by The American Phytopathological Society on a major plant disease.

MacHardy's students and colleagues know him as a dedicated and talented mentor. He has served his society as editor, officer, and author and has greatly added to our knowledge of apple scab and its management. Researchers, IPM programs, and growers worldwide have benefited from this work, a fact acknowledged by his peers in 1996 when he was presented with the Award of Merit, the highest honor bestowed by the Northeastern Division of APS. For his many and valuable contributions, he is a particularly deserving nominee for fellow of The American Phytopathological Society.

W. Allen Miller

W. Allen Miller was born and raised in River Forest, IL. He graduated cum laude with a B.A. degree with distinction in biology from Carleton College in 1978. In 1984, he earned a Ph.D. degree in molecular biology from the University of Wisconsin in Madison, in the laboratory of Timothy C. Hall. His graduate research focused on the mechanisms by which *Brome mosaic virus* replicase recognizes its template and initiates RNA synthesis, including the discovery of the process by which many positive-strand RNA viruses synthesize subgenomic mRNAs.

From 1984 until 1988, Miller served as a research scientist in the laboratory of Wayne L. Gerlach and Peter M. Waterhouse at the CSIRO Division of Plant Industry in Canberra, Australia. There, he determined the complete nucleotide sequence of the genome of *Barley yellow dwarf virus* (BYDV), the first for any virus in the family *Luteoviridae*, and he codiscovered and sequenced the first known satellite RNA of BYDV (an isolate now known as *Cereal yellow dwarf virus* [CYDV]). The yellow dwarf viruses are considered to be the most economically important and ubiquitous viruses of wheat, barley, and oats worldwide. Until Miller sequenced the BYDV genome, very little was known about BYDV molecular biology despite its agricultural importance. Miller's sequence, along with subsequent sequences determined in the laboratory of APS Fellow Richard Lister, forced a reclassification of luteoviruses (to which Miller contributed as a member of the ICTV Committee on *Luteoviridae*), most notably the split of the different BYDV serotypes into two different genera.

Since joining the Iowa State University (ISU) faculty in 1988, Miller has become one of the world's leading authorities on mechanisms of BYDV molecular biology. Miller's research has made important contributions to several disciplines, including RNA structure and function and the fundamental mechanisms of eukaryotic protein synthesis. His strategy has been to transfer knowledge and techniques between fields that often do not interact. He applied state-of-the-art discoveries in the field of translation mechanisms from nonplant systems to the plant world. By attending conferences and publishing in journals that do not focus on plants or pathogens, Miller has made the greater molecular biology world more aware of plant viruses as fascinating model systems that have provided insight on novel RNA interactions and translation processes unknown elsewhere in any biological system.

Miller's laboratory discovered that translational control signals in an mRNA can consist of separate domains, thousands of bases apart, that must interact for the translation event to take place. He showed that the sequence that mediates efficient translation of BYDV RNA in the absence of the 5′ "cap" structure is located in the 3′ untranslated region and it base pairs to the 5′ untranslated region. This interaction of just five base pairs separated by a four-kilobase loop to control translation was unprecedented in any known eukaryotic or prokaryotic RNA. These results led to the proposal of an elegant "RNA traffic signal" model by which the long-distance interactions may mediate the switch from translation to replication of the viral genome. His novel research findings may have wide application as tools for high-level expression of transgenes. The BYDV cap-independent translation enhancer has been developed into a product that is now available commercially from the biotechnology company Promega. His work has also attracted attention from scientists working with human pathogens as diverse as dengue and SARS viruses.

Miller has made seminal discoveries on mechanisms of recoding in plants. Recoding occurs when a sequence in an mRNA programs the ribosomes to decode the message in a noncanonical way. Examples include ribosomal frameshifting and stop codon readthrough. Miller's laboratory was the first to show that ribosomal frameshifting occurs in plants, and Miller and colleagues identified the sequences and structures in BYDV RNA required for frameshifting in the polymerase gene and for readthrough of the coat protein gene stop codon. In both cases, unlike any recoding signals known previously, some of the required signals are located hundreds to thousands of bases downstream of the recoding event.

Miller also identified a hammerhead ribozyme in the CYDV (formerly BYDV) satellite RNA that forms novel alternative structures. Miller and colleagues showed that CYDV satellite RNA can be replicated by any virus with a polerovirus RNA-dependent RNA polymerase.

Miller's detailed analyses of luteovirus genomes, including dozens of diverse yellow dwarf virus genomes sequenced recently in his laboratory, allowed him and colleagues to show that luteoviruses and poleroviruses (formerly subgroup I and subgroup II luteoviruses, respectively) probably evolved by replicase strand switching at subgenomic RNA promoters. The identification of these and other recombination hot spots has important implications for luteovirus evolution, ecology, and resistance breeding. In a practical application, Miller and collaborator David Somers (formerly of the University of Minnesota) showed that transgenic oats transformed with part of the BYDV genome recovered rapidly from virus infection.

Recently, Miller turned his attention to interactions of viruses with aphids, the vectors of *Luteoviridae* and many other plant viruses. Miller and collaborator Bryony Bonning (ISU) have developed tools, including host cell lines and a full-length infectious clone, to investigate replication of *Rhopalosiphum padi virus*, a pathogen of the major aphid vector of BYDV.

The stimulating research environment provided by Miller has attracted many excellent students and postdocs to his laboratory. Fifteen students have been awarded Ph.D. degrees under his advice, five received M.S. degrees, and seven worked as undergraduate researchers in his laboratory. He served as an advisor for 13 postdocs. Miller's research has been diverse by today's standards of highly specialized scientists. He has been invited to present talks at international meetings and to write review articles in highly reputed journals and books on all of the above topics. The research has been published in well-respected journals and resulted in two patents and a commercial molecular biology product.

Miller has been tapped to serve in a variety of prestigious roles, including the ICTV *Luteoviridae* Committee, the Editorial Board of *Virology*, multiple grant review panels for the USDA National Research Initiative (plant–microbe associations), the NSF Molecular and Cellular Biology division (biochemistry of gene expression), and NIH virology study sections. Recently, he completed a 3-year term as chair of the molecular, cellular, and developmental biology graduate program at ISU. In 2006, he was appointed director of the Center for Plant Responses to Environmental Stresses in the Plant Sciences Institute of ISU.

Barbara S. Valent

Barbara S. Valent was born in Perry, IA, and grew up in Colorado. She received her B.A. degree in chemistry in 1972 and her Ph.D. degree in biochemistry in 1978 from the University of Colorado at Boulder. Following postdoctoral work at Cornell University and the University of Colorado, she began her research career as a principal investigator in molecular plant pathology at DuPont Central Research and Development, Delaware, in 1985. She was promoted to the ranks of research leader in 1992, research manager of the Plant and Fungal Genetics and Molecular Biology Program in 1994, and research fellow and technical leader of the Genetic Disease Resistance Program of DuPont Agricultural Products in 1997. Valent was appointed as a professor in the Department of Plant Pathology at Kansas State University (KSU) in 2001. In 2002, she was designated a university distinguished professor, and in 2004, she was appointed chair of the Interdepartmental Genetics Program at KSU.

Valent has made outstanding and fundamental contributions in the field of plant pathology. More than 20 years ago, Valent recognized the need for a well-characterized and easily manipulated model system to understand how plants and fungi interact to ultimately lead to disease or resistance. She proposed and developed *Magnaporthe grisea*, the rice blast fungus, to serve as such a model. Due to her efforts, this pathogen is now one of the most extensively studied and important fungal models for molecular genetic and biochemical analyses of plant–fungal interactions. Using this research tool as her base, she has been at the forefront of several fundamental areas. Valent was the first to identify and clone both a blast fungal gene that controls the induction of resistance in plants *(Avr* gene) as well as the corresponding gene from rice (*R* gene) that is involved in recognition of the fungal gene. She was the first to demonstrate for this class of *R* gene that the *AVR* and *R* gene products physically interact and that this interaction likely occurs inside living plant cells. These are exciting findings with huge implications for the transduction of the signals resulting in plant resistance.

Valent has been an effective champion for fungal genomics, serving on the scientific advisory board for the *M. grisea* genome sequencing project since the effort was funded by NSF. Since joining the KSU faculty, she has been a leader and an active participant in the land-grant universities' multistate research committee focused on Biochemistry and Genetics of Plant–Fungus Interactions (NCR173). Interesting new research is coming out of the opportunity for contrasting and comparing the lifestyles of different fungi studied by the project's participants.

Valent is continuing to make fundamental advances in the field of plant pathology. Currently, she is applying functional genomics and advanced cell biology techniques to analyze the earliest events in plant–fungus interactions. Using live cell fluorescence microscopy, she and her students have discovered that, at any given infection site, the rice blast fungus sequentially invades plant cells through a process that appears to be exclusively biotrophic. This is a surprising result, because the fungus was previously thought to switch to a necrotrophic style of infection soon after penetrating the first plant cell. Moreover, Valent and her students have found that the process through which the fungus moves from cell to cell within the plant involves extreme hyphal constriction and appears to rely on movement through plasmodesmata, the tiny channels that connect one plant cell to another. Both of these results were reported in an invited lecture that Valent presented at the 2006 International Plasmodesmata Conference in Scotland.

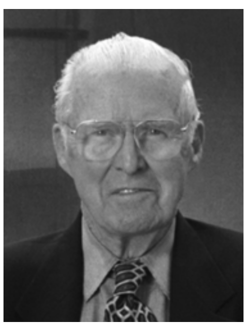
Using laser microdissection and other novel enrichment techniques, she and her students are analyzing plant and fungal gene expression in the first-invaded plant cells. A number of fungal genes have been identified that show a hundredsfold increase in expression upon plant infection, and these genes are being further analyzed via functional genomics approaches, including bioinformatics and gene disruption. These genes are good candidates for fungal effectors of pathogenicity, a topic that is currently poorly understood in plant-pathogenic fungi.

Valent's many profound insights also have important practical applications. While elucidating how fungal pathogens adhere to and penetrate host plants, which involved the genetic dissection of melanin biosynthesis in *M. grisea*, she and her colleagues discovered different possible targets for chemical control of fungal diseases and also a powerful fungal adhesive that even sticks to Teflon! This adhesive was later patented. Based on findings using molecular markers for analysis of *M. grisea* population structure over wide geographic areas, she and her collaborators have fundamentally changed the strategies plant breeders use to deploy resistance to this important disease. Molecular markers corresponding to the *R* gene cloned in her laboratory have also been valuable, because this gene confers resistance to the major pathotypes of the fungus in the United States. Thus, Valent's basic research has had huge implications for practical disease control.

Award of Distinction

This award, the highest honor the Society can bestow, is presented on rare occasions to persons who have made truly exceptional contributions to plant pathology.

Norman E. Borlaug



Norman E. Borlaug was born in Iowa, where he grew up on a family farm. Borlaug attended the University of Minnesota, where he received his M.S. and Ph.D. degrees in plant pathology and was also a star NCAA wrestler. For the past 20 years, Borlaug has lived in Texas, where he is a member of the faculty at Texas A&M University.

Entering college as the depression began, Borlaug worked for a time in the Northeastern Forestry Service, often with men from the Civilian Conservation Corps, occasionally dropping out of school to earn money to finish his degree in forest management. He passed the civil service exam and was accepted into the Forest Service, but the job fell through. He then began to pursue a graduate degree in plant pathology. During his studies, he did a research project on the movement of rust spores. The project, undertaken when the existence of the jet stream was not yet known, established that rust spore clouds move internationally in sync with harvest cycles—a surprising finding at the time. The process opened Borlaug's eyes to plant disease and food production.

At the same time, the Midwest was becoming the Dust Bowl. Though some mythology now attributes the Dust Bowl to a conversion to technological farming methods, in Borlaug's mind, the problem was the lack of such methods. Since then, American farming has become far more technological, and no Dust Bowl conditions have recurred. Borlaug was horrified by the Dust Bowl and simultaneously impressed that its effects seemed least where high-yield approaches to farming were being tried. He decided that his life's work would be to spread the benefits of high-yield farming to the many nations where crop failures as awful as those in the Dust Bowl were regular facts of life. When he was a young scientist in the 1940s, he was sent by the Rockefeller Foundation to run a project in Mexico. The country's wheat harvests were being devastated by stem rust. The program's initial goal was to teach Mexican farmers new farming ideas, but Borlaug soon had the growers seeking agricultural innovations. One was "shuttle breeding", a technique for speeding up the movement of disease resistance between strains of crops. Crops were shuttled between the climates of the highlands and the plains; thus, planting of two generations each year could be completed. From test results in both environments, Borlaug and his colleagues developed a drought-hardy, rust-resistant strain of wheat and then crossed it with a dwarf Japanese strain to produce a hybrid short enough to survive the wind and channel growth into grain. From total dependence on wheat imports, Mexico had within a few years shifted to being to a net exporter of wheat.

In 1963, the Rockefeller Foundation and the government of Mexico established CIMMYT as an outgrowth of their original program and sent Borlaug to Pakistan and India, which were then descending into famine. Borlaug argued that India and other nations should switch to cereal crops. He failed in his initial efforts to persuade the seed and grain monopolies to switch to high-yield crop strains.

Despite the institutional resistance, Borlaug stayed in Pakistan and India. By 1965, famine on the subcontinent was so bad that governments made a commitment to wheat. Borlaug arranged for a convoy of 35 trucks to carry high-yield seeds from CIMMYT to a Los Angeles dock for shipment. The convoy was held up by the Mexican police, blocked by U.S. border agents attempting to enforce a ban on seed importation, and then stopped by the National Guard when the Watts riot prevented access to the Los Angeles harbor. Finally, the seed ship sailed. Borlaug says, "I went to bed thinking the problem was at last solved, and woke up to the news that war had broken out between India and Pakistan."

Nevertheless, Borlaug and many local scientists, who were his former trainees in Mexico, planted the first crop of dwarf rust-resistant wheat on the subcontinent, often working within sight of artillery flashes. Sowed late, the crop germinated poorly, yet yields still rose 70%. This prevented general wartime starvation in the region, though famine did strike parts of India. There were also riots in the state of Kerala in 1966, when a population whose ancestors had for centuries eaten rice was presented with sacks of wheat flour originating in Borlaug's fields.

Owing to wartime emergency, Borlaug was given the go-ahead to circumvent the traditional seed companies. "Within a few hours of that decision I had all the seed contracts signed and a much larger planting effort in place," he says. "If it hadn't been for the war, I might never have been given true freedom to test these ideas." The next harvest was a 98% improvement. By 1974, India was self-sufficient in the production of all cereals. Pakistan progressed from harvesting 3.4 million tons of wheat annually when Borlaug arrived to around 18 million today, India from 11 million tons to 60 million. In both nations, food production since the 1960s has increased faster than the rate of population growth. Briefly, in the mid-1980s, India even entered the world export market for grains. Borlaug's accomplishment came to be labeled the Green Revolution. In 1970, Borlaug received the Nobel Peace Prize, the only person working in agriculture to ever be so honored. Since then, he has received numerous honors and awards, including the Presidential Medal of Freedom, the Public Service Medal, the Rotary International Award for World Understanding, and America's highest civilian award, the Congressional Gold Medal. Borlaug has saved more lives than any other person who has ever lived. Today, Borlaug divides his time among CIMMYT, where he teaches young scientists seeking still-more-productive crop strains for the developing world; Texas A&M, where he teaches international agriculture every fall semester; and the Sasakawa Global 2000 projects that continue to operate in 12 African nations.

Excellence in Extension Award

This award recognizes excellence in extension plant pathology.

Donald E. Hershman

Donald E. Hershman was born in Harrisburg, PA. He received his B.A. degree in biology from West Chester State College (1978) and his M.S. and Ph.D. degrees in plant pathology from Rutgers University (1981 and 1983, respectively). He joined the faculty in the Department of Plant Pathology at the University of Kentucky (UK) in 1984 as an assistant extension professor (100% extension) with responsibility for grain crop diseases in west Kentucky. Hershman was promoted to associate extension professor in 1989 and to extension professor in 1995. He currently has statewide responsibilities for small grain and soybean diseases, with a continuing 100% extension appointment.

Hershman developed a highly productive and balanced program with significant local, regional, and national impact. He is recognized by his peers and clientele for his excellence in extension programming; his record of service to his profession is exemplary. His many invited presentations, his numerous regional/national publications, and particularly the major leadership roles he has assumed attest to his national standing.

Throughout his career, Hershman has placed great emphasis on professional service and leadership activities. From 1998 to 2004, he was chair of the Exam and Procedures Committee and was on the Board of Directors for the 13,600-member International Certified Crop Adviser (ICCA) Program. In the former role, he was responsible for the development and maintenance of exams and performance objective modules. In addition, he oversaw the implementation of Standard Operating Procedures for exam maintenance for 37 "Local Boards" throughout the United States and Canada. In appreciation of his efforts, Hershman was given the organization's 2004 Outstanding Service Award. Locally, he has been on the Kentucky CCA Board since 1996 and concluded his final year as board chair in 2006.

Hershman played significant roles in the U.S. Wheat and Barley Scab Initiative. He served as vice chair of the Chemical and Biological Control Research Area Committee from 2001 to 2005, working closely with others to review and recommend funding (ca. $400,000+ annually) of research proposals to the Executive Committee. Hershman was responsible for data collection, analysis, and summarization for the multistate Uniform Fusarium Head Blight (FHB) Fungicide Trials. Data from these trials have been used to defend multiple FHB fungicide section 18 requests to the Environmental Protection Agency. Hershman also serves his local wheat clientele in superior fashion. He developed four successful section 18 requests (2004–2007), which allowed producers to use tebuconazole to manage FHB in Kentucky. Over the years, Hershman has written a large number of wheat disease extension publications and has made more than 275 wheat disease presentations at grain days, field days, and commodity meetings since 1984. As part of the UK Wheat Science group, he helps coordinate wheat outreach activities and research.

Currently, Hershman is a leader in the U.S. response to the soybean rust (SBR) threat. His activities were instrumental in the development and implementation of effective disease surveillance activities. In 2005, he developed two listservs to facilitate professional communication on SBR. These listservs were cited as a success story in the 2006 General Accounting Office report, GAO-06-337. As coordinator for the Southern SBR Sentinel Network, Hershman moderates a weekly national teleconference and facilitates funding activities. He is frequently quoted in the mainstream press. In addition, he coedited and was an author of the national publication *Using Foliar Fungicides to Manage Soybean Rust*. Nearly 275,000 copies of this publication have been distributed to date. He was lead author of *Soybean Rust Fungicide Use Guidelines*, which resides on the USDA SBR website. This publication has been used by numerous state extension specialists as a template for their SBR fungicide recommendations. Hershman coordinated the highly successful 2006 National SBR Symposium. His importance to the SBR response was validated when he, as part of a team, received the U.S. Secretary of Agriculture's 2006 Honor Award. A related role, currently being played by Hershman, is chair of the Steering Committee of the IPM-PIPE, a multiagency, multiorganizational, multi-institutional extension, educational, and pest informational activity. Hershman's national SBR and IPM-PIPE activities have not been at the expense of his Kentucky clientele. He maintains a heavily used SBR toll-free hotline, uses an extensive e-mail list to communicate with clientele, developed and maintains the Kentucky SBR website, and uses a host of other outreach methods to disseminate SBR information to Kentuckians.

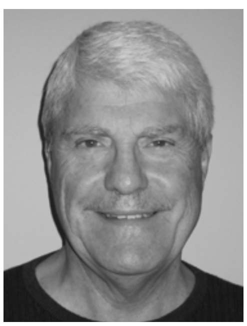
Hershman maintains an active applied research program, primarily involving diseases of soybean and wheat. The focus of this program is to improve disease control recommendations and to develop new strategies in keeping with UK's land-grant mission. In addition to receiving grant awards from several national and regional sources, his program has been well supported by Kentucky commodity groups ($355,300) and industry ($366,000). He has published a wealth of notes, reports, abstracts, and articles in a range of proceedings, technical publications, and refereed journals. Hershman also used his writing skills as an associate editor for *Plant Disease* (2000–2002), a senior editor for *Plant Disease* (2004), and a section editor for *Biological and Cultural Control of Plant Diseases* (2002–2004) and *Fungicide and Nematicide Tests* (1986–1994). He has reviewed 108 manuscripts from seven journals since 1984 and has been on four regional or national grant review panels.

Hershman has received numerous awards and honors for his extension service. In addition to those already noted, he received the inaugural UK College of Agriculture Extension Impact Award in 2006 and was recipient of the 2005 Kentucky Soybean Association Distinguished Service Award. He received excellence awards for educational materials from the American Society of Agronomy (1998, 2000, 2006) and the American Society of Horticulture (1990). He received five awards (1988–2005) from the Kentucky Association of State Extension Professionals, including their Outstanding New Specialist Award. The Southern Soybean Disease Workers recognized him with their Junior Distinguished Service Award in 1987 and the Presidential Service Award in 1991.

Excellence in Industry Award

This award recognizes outstanding contributions to plant pathology by APS members whose primary employment involves work outside the university and federal realms either for profit or nonprofit.

Jim Frank



Jim Frank was born in Cleveland, OH, and received his B.S. degree in botany from Ohio University and his M.S. and Ph.D. degrees in plant pathology from the University of Illinois in 1969 and 1970, respectively. Frank has extensive experience in both academia and industry and his career has been spent equally between them. From 1970 to 1978, Frank worked for the USDA ARS at the University of Maine, where he codeveloped the potato varieties 'Atlantic' and 'BelRus'. He established the importance of *Rhizoctonia* on potato yields, demonstrating the importance of the cumulative effects of the disease on yield and quality from sprout nip through black scurf on the tubers. In 1978, he accepted a USDA ARS plant pathologist position as the original member of the Center for Cereals Research at The Pennsylvania State University. Frank's research focused on the epidemiology of cereal diseases with an emphasis on the impact of agronomic practices. He was instrumental in introducing high-input management cereal production into the northeastern United States. In 1987, Frank became a senior plant pathologist with Syngenta (then ICI Americas/Zeneca) and led the initial evaluations of azoxystrobin in North America.

Within the industry, Frank made significant contributions in several areas of plant pathology. Among the most noteworthy of his accomplishments was the development of a leading team of pathologists to promote, develop, and introduce new fungicides in the United States. His efforts to educate and mentor the field biology team, which was made up primarily of weed scientists and entomologists, led to a very successful fungicide introduction. Azoxystrobin was registered in the United States for the control of more than 200 diseases on more than 50 crops. Azoxystrobin quickly became the most widely used fungicide globally. This translated into disease control, increased crop yields, and improved crop quality for growers, which accounted for an estimated savings to growers in excess of 10 million dollars annually. Frank produced a series of technical training manuals for azoxystrobin to educate Syngenta's sales and research teams, as well as growers and distributors. He then established a world-class training program and converted a predominantly herbicide-oriented company into a leading fungicide company.

Frank was an active member of the North American Fungicide Resistance Action Committee (FRAC) for strobilurins since its formation and he chaired the committee at one time. His contributions to FRAC and the establishment of guidelines on the number of strobilurin applications that can be applied in a season have been essential to the longevity of the strobilurin fungicides. Frank persuasively encouraged Syngenta to obtain chlorothalonil and fluazinam from ISK to be used in a resistance management strategy for azoxystrobin. This move proved to be extremely important for Syngenta.

During his 19-year career in industry, Frank was an active member of APS. He served on a number of APS committees, including the Industry Committee, the Soil-borne Disease Committee, the Chemical Committee (ad hoc), and the Office of International Programs. He chaired the Industry Committee in 2005. Frank participated annually in the industry-hosted graduate student breakfast to promote the profession and to encourage students to consider industry as a career opportunity.

Frank authored more than 47 refereed publications, one book chapter, and 38 nonrefereed publications. His ability to impart technical knowledge via an entertaining fashion is truly unique. Frank has always been a strong advocate of the industry and recognizes the importance of collaborative efforts between the industry and academia. The grower, the ultimate customer, was a common theme throughout Frank's career—be it better potato varieties, increased wheat yields via higher inputs, managing the longevity of an excellent fungicide utility via resistance management guidelines, or providing training and guidance internally and externally. He should be proud because his contributions have resulted in improved crop yields and quality that have benefited many growers in the United States. Frank's commitment to ensuring effective disease management for the long term is still visible in the Syngenta fungicide strategies and product use labels he helped create over the last 10 years of his career. Frank has retired and he is currently consulting.

Excellence in Teaching Award

This award recognizes excellence in teaching plant pathology.

Paul Vincelli

Paul Vincelli, extension professor of plant pathology at the University of Kentucky, is a native of Eatontown, NJ. He received a bachelor's degree (botany, 1981) and master's degree (plant pathology, 1983) from Rutgers University and a Ph.D. degree (plant pathology, 1988) from Cornell University.

Vincelli has taught courses at three universities, beginning his teaching career following the lecture model common to college-level science classrooms. However, as he has studied and reflected on topics relating to teaching and learning, his teaching approach has evolved over the past decade toward an inquiry-based model.

Vincelli's thinking about teaching and learning was heavily influenced and greatly enriched by a sabbatical experience in 1998 with Jo Handelsman, a nationally recognized leader in college-level science instruction at the University of Wisconsin. While there, he took her course, Teaching Biology (Plant Pathology 875), undertook an in-depth study of academic literature on teaching and learning, and engaged in classroom and laboratory observation with a number of colleagues. These efforts culminated in an entirely new written teaching philosophy, as well as major modifications to the courses he teaches.

Vincelli's teaching approach is anchored in constructivism. He summarizes one of the most fundamental insights about teaching and learning achieved through his sabbatical as follows: "When I teach, I do not build students' knowledge structure; I simply share my own. No matter how hard I may try, I cannot construct my students' knowledge for them; only they can do so. As a teacher, I cannot really 'convey knowledge'; all I can do is to *create the conditions that facilitate students' own knowledge construction*."

His instruction rests upon this foundation and, therefore, centers on stimulating thinking in students. Over time, he has modified and refined his graduate-level teaching substantially, with the majority of class time now devoted to active-learning exercises, case studies, problem solving, and discussion. The course in which he has the greatest pride, Principles of Plant Pathology (PPA 400G), has gone through several permutations as he has conceptualized and experimented with several teaching approaches, including cooperative learning. PPA 400G has evolved into a very heavily inquiry-based course, with classroom activities all semester long that not only teach important subject matter but also systematically develop cognitive skills. Vincelli's teaching approach in PPA 400G, described in a recent paper in *The Plant Health Instructor*, successfully motivates students to come to class having read in advance and prepared preliminary disease cycles based on the reading. These preclass assignments, coupled with in-class group work as well as both guided and open-ended inquiry, stimulate students to think at the highest cognitive levels: *analysis* (by analyzing written literature), *synthesis* (by constructing disease cycles), and *evaluation* (by evaluating how disease management practices affect disease cycles). His laboratories in PPA 400G also have many inquiry-based elements, culminating with students designing their own unique disease control experiments. With such pedagogical innovations, PPA 400G has proven to be a very effective and popular course. Yet, Vincelli never waivers or tires in his efforts to improve the students' learning experiences and continues to experiment with and evaluate teaching techniques in the classroom.

Vincelli has been active in sharing his insights with colleagues through scholarly communications on teaching and learning, including four refereed papers in *The Plant Health Instructor* and presentation of several college-wide seminars. Among his recent contributions is the paper "An inquiry-based approach to teaching disease cycles" (PHI-T-2005-0222-01), a unique contribution to our discipline, which outlines how introductory students can be taught both content and cognitive skills pertinent to plant pathology in the context of an introductory course. Vincelli also has supported scholarly communication on teaching and learning through service on the APS Teaching Committee, as senior editor for *The Plant Health Instructor*, and as a reviewer for the recent introductory textbook, *Essential Plant Pathology*, from APS PRESS by Gail Schumann and Cleora D'Arcy. He also led his department in the development of a graduate-level course, Teaching in Plant Pathology (PPA 799), in which students earn credit through the study of literature on teaching and learning and through mentored teaching in the classroom.

Vincelli has been an advocate for innovative teaching efforts, with one overarching goal: that students learn to the maximum of their individual abilities. His stated goals for students are that they learn a core of plant pathology knowledge as well as cognitive skills, that they develop a conceptual framework in plant pathology appropriate to their chosen professional goals, and that they leave his classroom equipped for a lifetime of learning on plant diseases and their management. Without question, his students learn much under his tutelage, and they leave the university better equipped to make well-founded decisions with respect to plant diseases and their management. However, for Vincelli, teaching is ultimately about much more than our discipline. This is evidenced in the way he treats each of his students and in the concluding words of his teaching philosophy: "I remind myself that it is a sacred honor to be entrusted with helping these young scholars discover themselves and their own potential."

International Service Award

This award recognizes outstanding contributions to plant pathology by an APS member for a country other than his or her own.

Naidu Rayapati

Naidu Rayapati, native of India, earned a B.S. degree in biology (1975), an M.S. degree in botany (1977), and a Ph.D. degree in plant virology (1985) from Sri Venkateswara University, Tirupati, India. After completing postdoctoral research at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) (1987–1989) and in the Department of Plant Pathology, University of Kentucky (1989–1992), he worked at ICRISAT (1992–1998) on virus disease problems in developing countries, especially in sub-Saharan Africa. Subsequently, Rayapati served as a consultant virologist with the Crop Protection Programme (CPP) of the Department for International Development (DFID), United Kingdom, until 1999, working on groundnut (= peanut) rosette disease virus complex (GRD) in Malawi and Uganda. He then worked (1999–2004) on *Tomato spotted wilt virus* (TSWV) in the Department of Plant Pathology, University of Georgia (UGA), Athens. In November 2004, Rayapati joined the faculty of the Department of Plant Pathology, Washington State University–Irrigated Agriculture Research and Extension Center, Prosser, to develop a program on virus diseases of grapevine and other crops of economic significance to Washington State's agriculture.

Rayapati elucidated the epidemiology of GRD and deployed sustainable disease management strategies by developing partnerships among a multidisciplinary team of scientists from ICRISAT, the United Kingdom, the United States, and national programs in sub-Saharan Africa with funding from DFID-CPP and the Peanut Collaborative Research Support Program (Peanut CRSP) of the U.S. Agency for International Development (USAID). GRD, with an estimated annual loss of $156 million, severely impacts the food security of smallholder farmers in sub-Saharan Africa. This disease has two main symptom forms and involves three causal agents, *Groundnut rosette assistor virus* (GRAV), *Groundnut rosette virus* (GRV), and its satellite RNA (sat-RNA), that are transmitted by the aphid *Aphis craccivora*. After developing molecular diagnostic tools for the three agents with Frances Kimmins at the Natural Resources Institute and with David Robinson at the Scottish Crop Research Institute (SCRI), United Kingdom, Rayapati showed that GRV and sat-RNA are always found together but can separate from GRAV in nature. Consequently, plants showing GRD symptoms do not necessarily contain GRAV. Diseased plants lacking GRAV do contribute to yield loss but are "dead ends" for disease spread, since the coat protein of GRAV that encapsidates GRV and sat-RNA is necessary for aphid transmission. He showed that a single vector aphid may acquire GRAV, GRV, and sat-RNA but does not always transmit all three agents, resulting in the separation of GRAV from GRV and sat-RNA in time and space. Rayapati showed that viruliferous aphids can transmit GRV and sat-RNA when probing mesophyll cells and cause GRD, but salivation into phloem sieve elements is essential for the transmission of all three agents. Elucidating the unique mode of transmission explained the lack of correlation between disease incidence and spread in the field. The presence of biotypes of *A. craccivora* differing in host-plant preference and transmission efficiency was also demonstrated.

In collaboration with Mike Deom (UGA), Rayapati determined the genetic diversity among GRD agents from different regions of sub-Saharan Africa. With Kimmins, he identified new sources of resistance in peanuts to the vector aphid, which broadened the genetic base of resistance against the disease. With funding from DFID-CPP, they deployed two new GRD-resistant varieties, suited to farmer and consumer preferences, for increased yields to alleviate poverty in Malawi and Uganda. Peanut CRSP has recently estimated that adoption of these varieties could contribute $47 million annually to Uganda's economy.

Rayapati has characterized several economically important viruses of peanut in Asia and Africa. In collaboration with Mike Mayo (SCRI) and Deom, he found genetic differences in the RNA-2 of geographically distinct isolates of *Peanut clump virus* (from West Africa) and *Indian peanut clump virus*, resulting in them being named as distinct species. With Said Ghabrial (University of Kentucky), he showed that strains of *Peanut stunt virus* (PSV) are reassortants between sat-RNA replication supporting and nonsupporting strains of PSV, resulting in the classification of the PSV strains into two distinct subgroups. Rayapati's collaboration with scientists at ICRISAT, UGA (Jim Demski), and University of Florida (Bill Dawson) provided the basis for classification of *Cowpea mild mottle virus* as a distinct species in the genus *Carlavirus* and of *Peanut bud necrosis virus* as a new species in the genus *Tospovirus*. He also found two distinct luteoviruses that cause stunt disease in chickpea. Rayapati, with John Sherwood (UGA) and Deom, determined the nature of N-linked oligosaccharides of the envelope membrane glycoproteins of TSWV to better understand tospovirus–thrips interactions.

Rayapati trained several scientists in plant virology and developed collaborative partnerships in Asia and Africa. With colleagues at ICRISAT, the International Center for Agricultural Research in the Dry Areas, Syria (Khalid Makkouk), the International Institute of Tropical Agriculture (IITA), Nigeria (Jackie Hughes), and scientists in developed countries, regional training courses were developed for scientists in Africa and Asia. His collaborative efforts with Hughes led to the first-ever conference on "Plant Virology in Sub-Saharan Africa" in 2001, which enabled virologists from sub-Saharan Africa to develop region-wide strategies to manage virus diseases that limit food production and farm income. Recently, Rayapati obtained a USAID-linkage grant with IITA to conduct research on virus diseases of cassava in Nigeria and funds through the Integrated Pest Management Collaborative Research Support Program (USAID) to address thrips-borne tospoviruses in vegetables in South and Southeast Asia. He also obtained funding to strengthen the capacity of the Indian agricultural research community in managing virus diseases under the U.S.–India Agriculture Knowledge Initiative.

Rayapati is an author/coauthor of more than 40 journal articles, review articles, technical reports, training course manuals, and a textbook. He has served as an ad hoc reviewer and on the APS Tropical Plant Pathology and Virology Committees. He has been an invited participant in several international conferences and technical meetings. Rayapati's contributions and achievements range from characterizing viruses, understanding the molecular aspects of viruses, and addressing practical aspects of virus disease problems of great significance to international agriculture. Rayapati promotes the international exchanges of knowledge and technologies and develops strategic research partnerships between scientists from developed and developing countries to increase food security in subsistence agriculture in developing countries.

Noel T. Keen Award for Research in Molecular Plant Pathology

This award recognizes APS members who have made outstanding contributions and demonstrated sustained excellence and leadership in research that significantly advances the understanding of molecular aspects of host-pathogen interactions, plant pathogens or plant-associated microbes, or molecular biology of disease development or defense mechanism.

Pierre J. G. M. de Wit

Pierre J. G. M. de Wit was born on February 27, 1949, in Grathem, the Netherlands. He received his M.Sc. degree in plant pathology from Wageningen University (WU), the Netherlands, in 1974. During his M.Sc. studies, he became fascinated by the genetics of innate immunity in plants as hypothesized in the gene-for-gene model pioneered by the American and Dutch scientists Flor and Oort, respectively. This fascination in innate immunity of plants remained throughout his career. In 1981, he received his Ph.D. degree from WU for work focused on cultivar-specific resistance of tomato to the fungal pathogen *Cladosporium fulvum*. In that system, he found support for the existence of both nonspecific elicitors, components that we nowadays call pathogen-associated molecular patterns (PAMPs). Later, he found evidence for the existence of specific elicitors, communicated in a 1982 seminal publication in *Physiological Plant Pathology* entitled "Evidence for the occurrence of race and cultivar-specific elicitors of necrosis in intercellular fluids of compatible interactions of *C. fulvum* and tomato." He spent a sabbatical year on a Fulbright fellowship in the laboratory of J. A. Kuc at the University of Kentucky, Lexington. He returned to the Netherlands and was appointed assistant professor of plant pathology at WU in 1982 and was promoted to associate professor in 1986 and to full professor in 1990. Since 1992, he has served as head of the Laboratory of Phytopathology at WU. From 1999 to 2004, he served as director of the multi-institutional Graduate School "Experimental Plant Sciences" of the Netherlands. Since 2003, he has also served as scientific director of the Centre for Biosystems Genomics, a Dutch center of excellence in plant and microbial genomics.

de Wit has made several outstanding contributions to molecular plant pathology, which are described in more than 120 original articles and reviews. Among his major accomplishments is the cloning and characterization of the first fungal avirulence gene, *Avr9*, in 1991. This momentous discovery was closely followed by the identification in his research group of a second avirulence gene, *Avr4*, described in a 1994 publication in *Nature*. This pioneering work was the first demonstration that fungal resistance is mediated by recognition of peptides and has greatly influenced many scientists working on host specificity and disease resistance, resulting, for instance, in the cloning of one of the first fungal plant resistance genes. The availability of the *Avr9* gene was instrumental for cloning the *Cf-9* resistance gene of tomato by a longtime collaborator, Jonathan Jones. In addition, the topic of fungal avirulence remains particularly current. More than a dozen years after the identification of *Avr9*, avirulence genes have been recently identified for the first time in obligate biotrophic fungi and oomycetes. It is now well accepted that understanding the virulence function of effector proteins is central to a mechanistic understanding of pathogenicity not just in interactions of plants with fungi but also with bacteria, oomycetes, and nematodes.

Presently, de Wit's research group has cloned eight effectors of *C. fulvum* and to all of them cognate *Cf* genes do exist in wild accessions of *Solanum* species. Resistance breeding using *Cf* genes has shown to be a very powerful and sustainable strategy to combat the leaf mold pathogen. He expanded his work on *Avr4* and *Avr9* and further exploited the *C. fulvum*–tomato system to make groundbreaking contributions to our understanding of race evolution in fungi by describing four different mechanisms by which they can evade recognition of the avirulence peptides by its host. He also characterized the virulence functions of two Avr peptides. In a 2005 *Science* publication, he showed, in collaboration with Jones's group, that the Avr2 peptide is secreted by *C. fulvum* into the apoplast of tomato and triggers cell death only in the presence of the tomato extracellular protein Cf-2 and the cysteine protease Rcr3. Avr2 binds and inhibits Rcr3, and the Rcr3–Avr2 complex is subsequently recognized by the Cf-2 protein, illustrating the dual functions of fungal avirulence proteins. In a few other key publications in the *Journal of Biological Chemistry* and *Molecular Plant–Microbe Interactions*, he showed that Avr4 is a chitin-binding protein that protects the fungus against plant chitinases. Avr4 proteins encoded by virulent alleles are no longer recognized by *Cf-4* plants but still bind chitin, suggesting that chitin binding represents a virulence function. His research group also made significant contributions to understanding signal transduction responses triggered by Avr peptides and mediated by cognate Cf proteins in plants, including an NB-LRR protein required for not only *Cf-4*-mediated hypersensitive response but also *R* genes against other pathogens. His findings have lead to several patents to exploit *Avr-R* gene interactions and defense signaling genes in disease resistance breeding.

de Wit has taken several leadership roles to service the science of molecular plant pathology. He is the current president of IS-

MPMI, and in 1999, he organized the international congress of the society in Amsterdam. Also, he organized several EU workshops, chaired the Scientific Committee of the 1995 Fungal Genetics Conference, and vice-chaired the Scientific Committee of the 1998 ICPP Congress. He is highly committed to training the next generation of scientists. As the head of the Laboratory of Phytopathology, he oversees a very active and diverse group of plant pathologists. In total, he supervised 40 Ph.D. students, several of which went on to become active scientists on their own. He teaches both introductory and advanced plant pathology courses. His teaching skills are in high demand, and he was invited to contribute to about a dozen Ph.D. national and international summer schools and courses.

de Wit is a regular keynote and session speaker at major conferences. Over the years, he has offered more than 125 invited seminars and presentations at various institutions and international conferences, including IC-MPMI, ICPP, ICCP, IC-PMB, Keystone Symposia, and the Gordon Conferences. He is recognized as a highly cited scientist in his discipline. He has served on the editorial board of several journals and on the advisory board of companies and institutions, such as Monsanto, Zeneca/Mogen, Scottish Research Institute, and the Max-Planck Institutes for Molecular Breeding and Terrestrial Microbiology, respectively. He received several awards for his research accomplishments, notably the Emil Christian Hansen Gold Medal for outstanding contributions to research in microbiology by the Carlsberg Foundation, Copenhagen, and the research prize of WU. In 1991, he was elected as a member of the Dutch Society for the Advancement of Science and, in 1999, of the Royal Netherlands Academy of Arts and Sciences.

Ruth Allen Award

This award recognizes individuals who have made an outstanding, innovative contribution to research that has changed or has the potential to change the direction in any field of plant pathology.

Herman B. Scholthof

Herman B. Scholthof was born in Kring van Dorth, Gorssel, the Netherlands, in 1959. He was raised on a farm, and after completing an agricultural college degree in plant research, he attended Wageningen University to obtain his B.S. and M.S. degrees in 1984 and 1986, respectively. For his dissertation research at the University of Kentucky, he investigated gene expression of caulimoviruses with Robert J. Shepherd. After completing his Ph.D. degree in 1990, he joined Andy Jackson and T. Jack Morris at the University of California-Berkeley (UC Berkeley), where he did postdoctoral work on *Tomato bushy stunt virus* (TBSV). In December 1994, Scholthof joined the faculty of the Department of Plant Pathology and Microbiology at Texas A&M University and was promoted to associate professor with tenure in 2000. A sabbatical leave as a visiting professor in biological chemistry and pharmacology at Harvard Medical School (2002–2003) was used to further his understanding of the physicochemistry of the TBSV-encoded P19 protein. In 2005, Scholthof was promoted to the rank of full professor.

As a Ph.D. student, Scholthof exhibited a flair for innovative thinking and experimentation. He was one of the first scientists to determine how *cis-* and *trans*-acting factors control gene expression of the polycistronic mRNA of caulimoviruses. The importance of his refined early research cannot be underestimated; some of these concepts have been applied to studying HIV and related human and animal viruses.

Scholthof had a very successful postdoctoral experience at UC Berkeley. There, he began working with TBSV and continues today to use this as a model virus to make important, conceptual, and practical contributions to our knowledge of virus–plant interactions. Scholthof showed that the capsid protein is not necessary for TBSV to systemically invade some plant hosts, and he then developed TBSV as a virus tool for expressing sequences in plants. Much of Scholthof's work has dealt with how TBSV interacts with its host for systemic invasion and how it causes symptoms. He discovered that two TBSV proteins, P19 and P22, are expressed from the same subgenomic RNA and have different but essential roles in pathogenesis. Scholthof's pioneering studies elegantly demonstrated the nature of the P19 protein as a pathogenicity factor and a protein that promulgated robust, systemic infections. With his creative and insightful interpretations of these roles for P19, he was an early originator of the hypothesis that the biological properties of P19 relate to its role as a suppressor of the host antiviral RNA silencing mechanism in order to protect TBSV RNA from degradation.

Scholthof is at the forefront of defining the relationships between structure and function of the P19 and P22 proteins. For instance, recent structural studies provided an explanation for earlier observations made by Scholthof on the effect of specific mutations on the structural integrity and biological activity of P19. Another example relates to his discovery that the function of P19 is dose dependent and that this is controlled by context-dependent "leaky scanning" to frequently bypass the P22 start codon and initiate translation at the P19 start codon. He recently demonstrated that the high dosage of P19 is important in the regulation and efficacy of P19 as a suppressor of RNA silencing to appropriate the high levels of short-interfering RNAs (siRNAs). As a direct outcome of this, P19 has become a preferred tool of researchers in the elucidation of RNAi pathways in plants, yeast, and *Caenorhabditis elegans*. Scholthof's scrutiny of TBSV-related interactions resulted in yet another pair of firsts: the genetic isolation and characterization of two novel host proteins that independently and specifically interact with P19 or P22. Most recently, he has shown that the ability of P19 to sequester siRNAs correlates with pathogenesis, and his group is the first to isolate an active antiviral RNA-induced silencing complex (RISC) from plants or any organism.

Scholthof recently developed the molecular tools to understand a newly recognized virus transmitted by the wheat curl mite. *Wheat mosaic virus* (WMoV) had proved to be an intractable problem for maize and wheat producers in the High Plains region of the United States. He reported the first partial characterization of WMoV, and his findings have proven to be important to understand the etiology of related mite-transmitted diseases.

Scholthof is an enthusiastic teacher of graduate courses in plant virology, molecular methods in plant–microbe interactions, theory of research, and virus gene vectors. He is sought after as a graduate and undergraduate student mentor, and he serves on numerous student dissertation committees. He also is a founding member of the Texas A&M intercollegiate faculty of virology.

Scholthof is widely recognized as an effective and enthusiastic collaborator. He is generous in distributing TBSV and P19 research materials, which has allowed many plant virology, *C. elegans*, medical, and molecular biology laboratories to perform experiments that would have otherwise been more difficult. Scholthof's TBSV-based gene–vector system has been used for groundbreaking research worldwide.

Scholthof has an outstanding record of publication in peer-reviewed journals. In 2004, he was selected to give the American Society for Virology state-of-the-art lecture. Scholthof has served as an associate editor and senior editor for both *Molecular Plant–Microbe Interactions* and *Phytopathology* and is on the editorial board of *Virology*. He regularly organizes, cochairs, and speaks at APS symposia and brings his students to meetings to present their research.

Scholthof fulfills the spirit and intent of the Ruth Allen Award, having developed an outstanding, innovative research program that has directed and elaborated on our understanding of the roles of virus-encoded proteins. Through his influence, TBSV and its P19 protein are recognized worldwide as model experimental tools to study the elegant coordination (and outcome) of host–virus interactions.

Syngenta Award

This award is given by Syngenta to an APS member for an outstanding contribution to teaching, research, or extension in plant pathology.

Niklaus J. Grünwald

Niklaus J. Grünwald was born and raised in Caracas, Venezuela. He entered the field of plant pathology after working as a grower and farm manager in Switzerland. He earned his B.S. degree in plant science from the University of California at Davis (UC Davis) in 1991, after transferring from the University of Zurich, and his Ph.D. degree under the supervision of Ariena H. C. van Bruggen from UC Davis in 1997. He pursued postdoctoral research with William E. Fry at Cornell University, joined the USDA Agricultural Research Service in Prosser, WA, as a research plant pathologist in 2001, and moved to his current position with the USDA ARS in Corvallis, OR, in 2004. He also holds a courtesy appointment in the Department of Botany and Plant Pathology, The Center for Genome Research and Bioinformatics, and the Molecular and Cellular Biology Research Programs at Oregon State University.

Grünwald's current research program is focused on the biology and management of oomycete plant pathogens, with an emphasis on the sudden oak death pathogen *Phytophthora ramorum*. Throughout his career, he has maintained a multidisciplinary, comprehensive research approach in both basic and applied plant pathology that has resulted in more than 40 journal articles, reviews, and book chapters.

Grünwald is probably best known for several significant contributions that provided multiple novel insights into the biology of clade 1c *Phytophthora* species at their center of evolution. He conducted this work as a postdoctoral researcher under the supervision of Fry in Toluca, Mexico. As is typical for his work, he conducted research on several interrelated aspects using interdisciplinary approaches to describe the natural history, genetics, evolution, and management of this host–pathogen system. Grünwald described the population structure of *P. infestans*, the cause of potato late blight, at its center of coevolution with wild *Solanum* species, and developed disease management strategies adapted to the highland tropics. During this work, he also codiscovered *P. ipomoeae* Flier & Grünwald, a new species belonging to clade 1c, the clade that also includes *P. infestans*, *P. phaseoli* affecting lima bean, and *P. mirabilis* infecting *Mirabilis jalapa*. The host specificity and phylogenetic work provide further evidence that clade 1c *Phytophthora* species were derived from one common ancestor and evolved through a process of sympatric speciation in the central highlands of Mexico. This constitutes a textbook example of sympatric speciation of a plant pathogen. He also demonstrated that oospores survive the dry Toluca winter and can serve as a source of primary inoculum for initiation of epidemics. His efforts showed that the number of fungicide sprays applied in central Mexico for control of potato late blight could be significantly reduced from the current grower practice of 16–24 applications to only 4–8 applications. Grünwald led an effort to characterize resistance in Mexican potato germplasm. This work clearly indicates that rate-reducing resistance to potato late blight is durable and can have a significant impact on disease management. More recently, he evaluated the hypothesis that exposure to several oomycete fungicides would lead to selection and lower genotypic diversity of the population. This is the first body of work testing selection within a growing season on a sexual plant pathogen at its center of origin and demonstrating that directional selection toward resistance combined with a reduction in genetic diversity of the *P. infestans* population was observed for the fungicide metalaxyl. These results also emphasize the need for a continuing vigilance regarding further introductions of exotic strains of *P. infestans* into the United States.

Grünwald also has made significant contributions toward understanding the population genetics of plant pathogens in general. He improved the use of indices of diversity and outlined a theoretical framework for the scaling of genotypic diversity indices that corrects previous inadequate applications. He also demonstrated that the oomycete *Aphanomyces euteiches* is much more diverse genetically than was thought previously. He showed that genotypic diversity exists within a soil sample and that populations are significantly differentiated at the field and regional scales. More recently, he contributed to the discovery that *Sclerotinia sclerotiorum* shows high genetic diversity and significantly less clonality in the western United States, which is consistent either with genetic exchange and recombination or with large population size and high genetic variation, particularly compared with the clonality observed in the northeastern United States.

In addition to his impressive research accomplishments, Grünwald has been actively involved in service to APS and other agencies. He served or currently serves as a senior editor for *Phytopathology*, an editor for *Plant Pathology*, a senior editor for the APS*net* Education Center, chair of the APS Epidemiology and Genetics Committees, and a board member of the APS Office of International Programs (OIP) and the APS Office of Electronic Communication (OEC). He has been instrumental in initiating the translation of many plant disease lessons into Spanish, Portuguese, and more recently, Chinese. He also has organized two workshops on Analysis of Population Genetic Data. He has served as a panel member or reviewer for several national and international grant programs. Grünwald's outstanding and innovative research contributions, which have improved our understanding of the population biology, evolution, and management of oomycete plant pathogens, and in particular, of *P. infestans* at its center of origin, make him a worthy recipient of this year's Syngenta Award.

William Boright Hewitt and Maybelle Ellen Ball Hewitt Award

This award recognizes a scientist within five years of their Ph.D. degree who has made an outstanding, innovative contribution directed toward the control of plant disease.

Natália A. Peres

Natália A. Peres was born and grew up in Santos, São Paulo, Brazil. She completed all of her university work at the São Paulo State University in Botucatu, Brazil. Her undergraduate degree was in agronomy, her M.S. degree was in horticulture, and in 2002, she received her Ph.D. degree in plant pathology. Her dissertation research dealt primarily with the epidemiology and management of postbloom fruit drop (PFD) of citrus caused by *Colletotrichum acutatum*. Subsequently, she spent 1-1/2 years as a postdoctoral fellow at the Instituto Biológico in São Paulo, continuing her work on citrus diseases. In 2003, she applied for a permanent position for the first time and was appointed as assistant professor at the Gulf Coast Research and Education Center (GCREC) of the University of Florida. Her responsibilities there include research and extension on diseases of strawberries and ornamentals.

Through her doctoral and postdoctoral research, Peres has established herself as an expert on foliar fungal diseases of citrus. The computer-assisted decision system that she developed, PFD-FAD, is available in three languages and is widely used by growers in the Americas to schedule fungicide applications for control of PFD. During her postdoctoral work, she compared existing PCR detection systems and developed her own for the identification of the black spot pathogen, *Guignardia citricarpa*, and differentiation of it from the commonly occurring saprophyte on citrus, *G. mangiferae*. Black spot is a serious disease in Brazil and shipment of fruit from areas with the disease to the United States and Mediterranean countries can represent a risk for introduction of the disease. Thus, it is important to have rapid diagnostic techniques to differentiate the pathogen from the saprophyte. In addition, she was involved in a project to evaluate controls for the postharvest symptom development of black spot and survival of the pathogen. She has always been interested in weather-based models for disease prediction and evaluated the Alter-Rater model, developed in Florida, for control of Alternaria brown spot of tangerines in Brazil. Reflecting her expertise on citrus diseases, she has consulted on PFD in Costa Rica and on Alternaria brown spot in Peru, been invited to speak on PFD and other citrus diseases in Brazil, and been invited to review black spot and *Guignardia* for CABI.

When she moved to a new position with the University of Florida, she had to learn new diseases and crops. There, Peres rapidly established an effective program on strawberry and ornamental diseases. On strawberries, she developed programs on the biology of anthracnose and Botrytis fruit rots and is evaluating predictive models for those diseases to help reduce fungicide usage on that crop. A major grant was obtained from the USDA RMA to fund the research on the development of predictive models for strawberry diseases. She has also evaluated fungicides and new programs for control of those diseases and receives substantial funding from fungicide manufacturers to support that work. She has been invited to consult on strawberry disease problems in Spain, Egypt, New Zealand, and Australia and has given talks in those countries on diseases and her research program in Florida. As the only pathologist at the center, she supervises the diagnostic clinic and frequently presents talks to grower groups, provides training for extension specialists, and advises strawberry and ornamental producers on disease control. On ornamental diseases, she cooperates with colleagues in a USDA-TSTAR-funded project on disease problems on caladiums and has an M.S. student working on powdery mildew of gerbera daisies. After only 3 years in her current position, she already serves as major professor for three students and serves on the committee of two others at the University of Florida, in addition to assisting a student in Brazil. Peres is an excellent manager and is able to coordinate many programs and still be effective. Her advice is sought by students, colleagues, and growers and she always tries to provide assistance wherever possible.

One of her principal areas of interest in research has been *Colletotrichum acutatum*, and she is recognized as an expert on that species. She was invited to present two talks on her work at the International Congress of Plant Pathology in New Zealand. Recently, she wrote a feature article for *Plant Disease*, together with other experts, that provided a great deal of insight into the infection process, host range, and life cycle of that fungus on many crops. That article has been used as a basis to launch a new project investigating the ability of isolates to move from one crop to another and utilizing molecular techniques to determine the relationship of isolates from different host plants. She has received a significant grant from USDA TSTAR to fund these studies. The results will have an impact on regulations for the movement of produce as well as on the epidemiology of the disease among multiple crops.

Peres has been active in APS and has attended most of the meetings since 1999. She is currently vice chair of the Fungicide Resistance Committee and coordinator for Portuguese translations for the APS*net* Education Center. She frequently reviews papers for *Plant Disease*, *Phytopathology*, and *Plant Health Progress*, as well as for other journals, such as *Biological Control* and *Crop Protection*. She is also active at GCREC. She has served on the search and screen committees for two faculty positions, the Website/Public Relations Committee, and the Cultivar Release Committee; frequently peer reviews publications of her colleagues; and has provided service to the center and the university in many capacities. Peres has already achieved a great deal early in her career in research and extension and has a very promising future.