ISPP INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

PROMOTING WORLD-WIDE PLANT HEALTH AND FOOD SECURITY

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

ISPP NEWSLETTER

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IN THIS ISSUE:

FROM CROP DISEASES TO MALNUTRITION, THE INNOVATORS ARE FINDING SOLUTIONS IN UNEXPECTED PLACES

NATION NEWS, 11 FEBRUARY 2025

Across Africa, an inspiring story is unfolding. Women scientists who have personally witnessed their communities struggle with scarce resources – from water shortages to lack of nutritious food – are stepping forward with solutions. Having experienced these challenges first-hand, they're combining their scientific expertise with deep local understanding to tackle problems they've seen affect their families and neighbours for generations. From finding better ways to grow food to creating nutritious snacks from traditional grains, these remarkable scientists are showing that the most effective solutions come from those who have lived through the challenges they're trying to solve.

From left: Dorah Momanyi, the CEO of iPoP Africa and a beneficiary of BioInnovate Africa, with innovations of popped grain products, processed free of gluten and oils, including mixed grains, sorghum, millet, and rice; and Sharon Kinyungu present at a women's empowerment workshop, on bio innovations in agriculture (Photo: Peter Musa and I Pool).

A PLANT PATHOLOGIST'S JOURNEY

When Sharon Kinyungu walks through maize fields in Sub-Saharan Africa, she sees more than just crops – she sees potential. As a plant pathologist and crop health specialist at Regen Organics, her journey began with a simple yet powerful motivation: helping farmers fight back against the invisible enemies destroying their harvests.

Her research journey took her from the University of Nairobi, where she studied microbiology and biotechnology, to Purdue University in the USA. There, she focused on a critical challenge facing African farmers – aflatoxin contamination in maize.

"I initially struggled to translate my research findings into practical solutions to benefit farmers," Sharon recalls. "I needed to develop environment-friendly practical solutions to pest problems and other farm inputs, but I lacked practical exposure to innovative ways of pest management."

This challenge led her to BioInnovate Africa in Nairobi in 2020, where she discovered how to transform complex research into actionable solutions.

"The training changed everything for me," she explains. "Working directly with farmers and other scientists, I learned how to turn my research into real solutions that farmers could actually use. Now I can help them grow more food while protecting their soil and dealing with pests in ways that don't harm the environment. I've developed natural pest control methods and created organic fertilizers that help the soil stay healthy and productive."

Today, her work with organic practices shows that nature-friendly solutions can increase crop yields by 30 percent.

"I am passionate about African farmers adopting sustainable organic practices such as production of protein-based animal feed and fertiliser, as this innovation helps to conserve nature," she states.

"In the training, which included a collaboration and participation approach, I gained skills that transformed my ability to contribute to sustainable agriculture, such as translating research findings into actionable solutions for increased farm productivity, climate resilience, biological pest control and integrated pest management strategies. These skills have empowered me to invent sustainable pest control methods and organic fertilisers to enhance soil health and crop yields," states Sharon, whose undergraduate study was microbiology and biotechnology at the University of Nairobi.

Out of her deep desire to bridge the gap between poverty and food security using traditional food crops, Dorah Momanyi, a food systems researcher, has focused on sorghum and millet, the two considered among the neglected indigenous foods. Through her iPoP company, she is processing them into ready-to-eat snacks.

"I ventured into this because of my vision to create opportunities for the youth and women. I wanted to demonstrate that we can turn our traditional foods into opportunities for income and food security for our people," she says. "Africa should protect its food systems' sovereignty through utilising local food resources, which will offer sustainable livelihoods and protect the environment against climate change."

In Ethiopia, Eden Lencha, a lecturer and researcher at Hawassa University's School of Human Nutrition, Food Science and Technology, is running a project of improving cassava varieties, to diversify and elevate the nutritional profile of staple foods. Her vision is to enhance food security and improve food quality production using sustainable and innovative food processing techniques. Doing more research activities ignited her passion for exploring entrepreneurial pathways within the food industry, with tangible community benefits.

REVIVING TRADITIONAL FOODS

While Sharon works to protect crops, Dorah Momanyi's mission grew from seeing families struggle with food security in her community. Through her company iPoP, she's transforming traditional African grains like sorghum and millet – crops that have sustained communities through harsh conditions for generations – into modern-day treasures. She's giving these resilient, nutritious grains new life as ready-to-eat snacks that appeal to contemporary tastes.

"I ventured into this because of my vision to create opportunities for the youth and women," Dorah explains.

"Africa should protect its food systems' sovereignty through utilising local food resources, which will offer sustainable livelihoods and protect the environment against climate change."

In Ethiopia, Eden Lencha's work was shaped by years of watching families struggle with malnutrition despite having access to local crops. As a lecturer and researcher at Hawassa University's School of Human Nutrition, she's now improving cassava varieties to enhance the nutritional value of foods that communities already know and trust.

"Growing up, I saw how families relied on traditional crops, but often lacked the knowledge to maximise their nutritional benefits," Eden shares.

"By blending traditional food systems with advanced scientific approaches, I am able to bridge the gap between food innovation and accessibility for vulnerable populations."

Her hands-on experience in developing shelf-stable food products has become a foundation for guiding others toward similar successes, as she mentors small-scale food enterprises run by women who share her passion for improving community nutrition.

EMPOWERING THROUGH EDUCATION, DISEASE CONTROL

The ripple effect of women in STEM extends to education, where Asero Diana's work at Busitema University in Uganda grew from witnessing post-harvest losses that left families without food and income. After studying fruit and vegetable dehydration at Jomo Kenyatta University of Agriculture and Technology in Kenya, she made it her mission to bring practical solutions back to her community.

Now, as an assistant lecturer and mentor at the Forum for African Women Educationalists (Fawe) -Uganda, she's helping students, particularly young women, create viable business models using locally fabricated solar dryers. While pursuing her PhD in Agricultural Economics and Policy at the University of Ghana, she continues to focus on solutions that address the real challenges she sees in her community.

"Every solution we develop must respond to a need I've seen first-hand in our villages," she says.

In western Kenya, Agnes Otwani's path to becoming a principal zoologist at the National Department of Livestock Development was paved with early memories of watching farming families lose their precious livestock to disease.

"I grew up seeing how the loss of even one cow could devastate a family's income and food security," she recalls.

This understanding drives her modern tsetse fly project, where she works directly with farmers in Busia County to construct metallic spraying crush pens and renovate cattle dips, making disease prevention both accessible and affordable.

"To meet our people's specific needs, as scientists we need to trickle down practicable solutions that are within their own means and capacity to implement," Agnes emphasises.

Her approach is deeply influenced by the women farmers she's worked with over the years.

"I've learned that the most successful solutions come when we truly understand the daily challenges these farmers face," she explains.

Her vision extends beyond disease control – she's advocating for gender-inclusive policies in scientific research and emphasising women's involvement in decision-making, particularly in sustainable livestock management.

"This includes designing products alongside the community, and walking with them through the knowledge path, which is a more effective learning process," she adds.

A VISION FOR THE FUTURE

These women's stories represent a larger movement in African science and innovation. As Dr Julius Ecuru, the principal scientist at Icipe and the BioInnovate project manager, notes, "Empowering women enables equitable distribution of bio-based solutions across societies. Women play an important role in agriculture, food systems, and community resilience, bringing in unique perspectives that drive innovative solutions."

Their success isn't measured just in scientific achievements but in the lives they've changed and the communities they've strengthened. Through their dedication, these scientists are not just solving problems – they're inspiring the next generation of women in STEM to dream bigger and create change that matter.

A TRIBUTE TO DR JAMES (JIM) WALLER, 1938–2024

MARK HOLDERNESS

I am very saddened to record the recent passing of Jim Waller. In his outstanding career, Jim made an immense contribution in the field of plant pathology. The value of the training and inspiration he provided to so many and the impact of his work in enhancing the lives and livelihoods of farmers around the world are an example to us all.

Jim began his career working with coffee diseases in Kenya and was then appointed as plant pathologist for the UK Ministry of Overseas Development. He then established the Global Plant Clinic at CABI's International Mycological Institute; a unique centre of expertise, to which farmers and researchers from around the world sent in samples of new crop diseases to be diagnosed - and control methods identified.

This invaluable service became world-renowned, and Jim was the expert at its heart, backed by the specialist mycologists of CABI. He travelled extensively to diagnose problems in the field and train local counterparts in their management. Through this, many crop disease epidemics were effectively contained, averting potentially huge losses. He characterised the pathogen causing coffee berry disease, bringing new opportunities for control of this devastating disease.

Jim supported the nascent Kenyan national agricultural research system and later managed the UK-funded research programme on perennial crops. Among many scientific publications, Jim compiled the standard text for field plant pathologists around the world: the Plant Pathologist's Pocketbook.

Jim was truly an international expert - he brought science alive through his passionate and dynamic approach to the subject, imbued with his mischievous sense of fun – and winning over officials, researchers and farmers around the world.

Jim led the way in developing the capacities required for countries to themselves be able to address disease problems as they arose. His commitment and enthusiasm inspired and benefited a long line of young professionals - including myself! As national capacities developed, he also led the shift towards developing local plant clinic services, responding directly to farmers' needs.

Jim made a huge difference to the lives of both his colleagues and the beneficiaries of his work. He was always supported by his much-loved wife Rosemary, 'the Mem Sahib', enabling him to be both a much-travelled expert and a terrific family man.

Always active in the Tropical Agriculture Association International, Jim was recently honoured with a TAAI Lifetime Achievement Award; a richly deserved recognition of all that he achieved.

Jim - old chap! - We miss you greatly but your legacy lives on as you touched our lives so profoundly. The world is truly a better place as a result of your contributions and we will always remember you with so much love and appreciation…

Obituary in the Guardian by Harry Evans

PLANT CELLS GAIN IMMUNE CAPABILITIES WHEN IT'S TIME TO FIGHT DISEASE

SALK NEWS, 8 JANUARY 2025

Human bodies defend themselves using a diverse population of immune cells that circulate from one organ to another, responding to everything from cuts to colds to cancer. But plants don't have this luxury. Because plant cells are immobile, each individual cell is forced to manage its own immunity in addition to its many other responsibilities, like turning sunlight into energy or using that energy to grow. How these multitasking cells accomplish it all—detecting threats, communicating those threats, and responding effectively—has remained unclear.

New research from Salk Institute scientists reveals how plant cells switch roles to protect themselves against pathogens. When a threat is encountered, the cells enter a specialised immune state and temporarily become PRimary IMmunE Responder (PRIMER) cells—a new cell population that acts as a hub to initiate the immune response. The researchers also discovered that PRIMER cells are surrounded by another population of cells they call bystander cells, which seem to be important for transmitting the immune response throughout the plant.

The findings, published in *Nature* bring researchers closer to understanding the plant immune system—an increasingly important task amid the growing threats of antimicrobial resistance and climate change, which both escalate the spread of infectious disease.

"In nature, plants are constantly being attacked and require a well-functioning immune system," says Professor Joseph Ecker, senior author of the study, Salk International Council Chair in Genetics, and Howard Hughes Medical Institute investigator. "But plants don't have mobile, specialised immune cells like we do—they must come up with an entirely different system where every cell can respond to immune attacks without sacrificing their other duties. Until now, we weren't quite sure how plants were accomplishing this."

Plants encounter a wide range of pathogens, like bacteria that sneak in through leaf surface pores or fungi that directly invade plant "skin" cells. Since plant cells are stationary, when they encounter any of these pathogens, they become singularly responsible for responding and alerting nearby cells. Another interesting side effect of immobile cells is the fact that different pathogens may enter a plant at different locations and times, leading to varying immune response stages occurring simultaneously across the plant.

With factors like timing, location, response state, and more all at play, an infected plant is a complicated organism to understand. To tackle this, the Salk team turned to two sophisticated cell profiling techniques called time-resolved single-cell multiomics and spatial transcriptomics. By pairing the two, the team was able to capture the plant immune response in each cell with unprecedented spatiotemporal resolution.

"Discovering these rare PRIMER cells and their surrounding bystander cells is a huge insight into how plant cells communicate to survive the many external threats they face day-to-day," says first author Tatsuya Nobori, a former postdoctoral researcher in Ecker's lab and current group leader at The Sainsbury Laboratory in the United Kingdom.

The team introduced bacterial pathogens to the leaves of Arabidopsis thaliana—a flowering weed in the mustard family commonly used as a model in research. They then analysed the plant's response to comprehensively identify each cell's state upon infection. In doing so, they discovered a novel immune response state, which they called PRIMER, that emerged in cells at specific immune hotspots. The PRIMER cells expressed a new transcription factor—a type of protein that regulates gene expression—called GT-3a, which is likely an important upstream alarm for alerting other cells to an active plant immune response.

Additionally, the cells surrounding these PRIMER cells proved equally important. Dubbed "bystander cells," the cells immediately neighboring PRIMER cells were expressing genes that enable long-distance cell-to-cell communication. The researchers plan to elucidate this relationship in future research, but for the time being, they suspect the interactions between PRIMER and bystander cells are key to propagating the immune response across the leaf.

This new spatiotemporal, cell-specific insight into the plant immune response is already available as a reference database for researchers worldwide. As pathogens continue to evolve and spread amid climate-related environmental changes and rising antibiotic resistance, the database offers an important springboard for preserving a future filled with healthy plants and crops.

"There is a lot of interest and demand for detailed cell atlases these days, so we're excited to create a new one that is publicly available for other researchers to use," says Ecker. "Our atlas could lead to many new discoveries about how individual plant cells respond to environmental stressors, which will be crucial for creating more climate-resilient crops."

PROFESSOR ROBERT PARK RECOGNISED AS NATIONAL 'PROBLEM SOLVER' BY UNIVERSITIES AUSTRALIA

THE UNIVERSITY OF SYDNEY NEWS, 26 FEBRUARY 2025

A panel of eminent Australians has chosen Professor Robert Park from the Faculty of Science and Sydney Institute of Agriculture as Universities Australia's national Problem Solver at its 2024 Shaping Australia Awards. The awards were announced on 25 February at Parliament House in Canberra, Australia.

Professor Park's entry, 'Saving our Cereals', was chosen for its pivotal role developing resistance to cereal fungus, known as 'rust', and its contribution to the Australian economy. Cereal rust diseases pose a serious threat to wheat, barley and oat production worldwide. Wheat rust alone causes annual losses of 5.47 million tonnes globally.

The Australian Government's Grains Research and Development Corporation estimates that genetic resistance to wheat and barley rust saves the Australian economy $1.09 billion annually. Professor Park's research group contributes 60 per cent of this, amounting to savings of more than $600 million a year in Australia and billions globally.

Professor Park is the Judith and David Coffey Chair of Sustainable Agriculture and Director of Cereal Rust Research at the Plant Breeding Institute at the University's Camden campus.

For nearly two decades, Professor Robert Park has led world-class efforts to develop cereal varieties with inbuilt genetic disease resistance. He is a highly regarded plant pathologist who has successfully translated his biological discoveries to real-world application. His research has had a sustained global impact on the economic viability of cereal production and food security.

The judges recognised Professor Park's leadership that led to the creation of the Australian Cereal Rust Control Program, the only research program in the world that fully integrates pathology, genetics and pre-breeding. Collaborating with privately funded cereal breeding programs ensures the research directly benefits farmers.

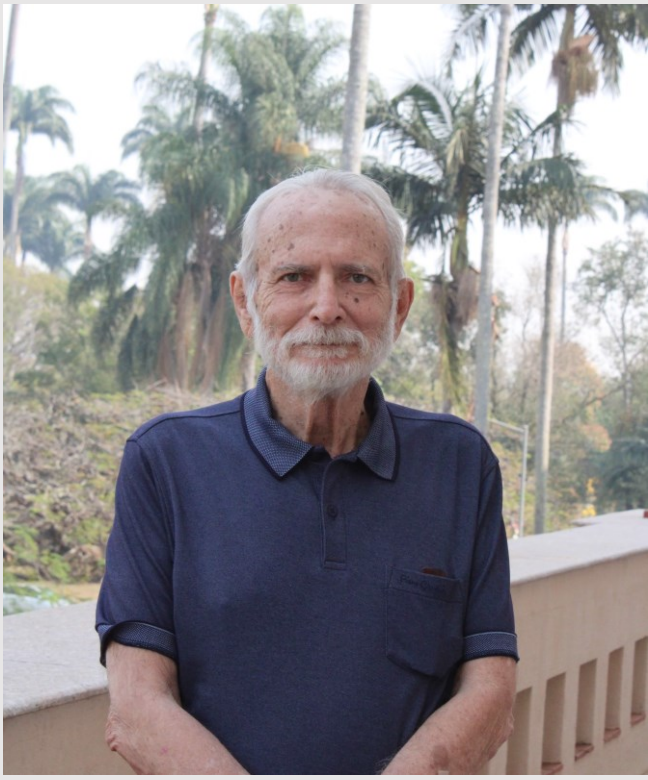
This research on cereal rust pathology and genetics has significantly boosted the economic viability of agricultural production.

Vice-Chancellor and President of the University of Sydney, Professor Mark Scott, said: "I congratulate Professor Park on this outstanding achievement and deserved recognition. It is a compelling example of what university researchers can accomplish - undertaking the painstaking and long-term work that leads to a solution of worldwide importance and benefit."

Professor Park has been recognised many times for his work, including the Eureka Award for Leadership and Innovation in Science, the NSW Science and Engineering Award for Excellence in Biological Sciences and the Poggendorff Medal and Lectureship of the Royal Society of NSW.

OBITUARY OF ARMANDO BERGAMIN FILHO, 1948–2025

PROF LILIAN AMORIN AND PROF EMERITUS LARRY MADDEN



Armando Bergamin Filho was born in Piracicaba, Brazil, and received his Master's and PhD degrees in phytopathology, in 1973 and 1975, respectively, from the University of São Paulo (USP), Brazil. He began his career as a Professor in the Department of Plant Pathology at USP in 1974. From the beginning of his scientific journey, he conducted research at international institutions, notably Osaka Prefectural University in Japan, Pennsylvania State University in the USA, and INRA-Versailles in France. He was introduced to plant disease epidemiology during his stay in the USA between 1977 and 1978. However, it was with the support of Prof. Jurgen Kranz, from the University of Giessen in Germany that he established himself on the international stage, participating in most of the International Workshops on Plant Disease Epidemiology and conducting research funded by international consortia.

He was a pioneer in the epidemiological study of plant diseases in Brazil and had a long-standing collaboration with Professors Bernhard Hau, Richard Berger, Tim Gottwald, Serge Savary, and Laetitia Willocquet, among others. Thanks to the group he built, Brazilian research in plant disease epidemiology is internationally recognised. He published around 140 papers in scientific journals and supervised approximately 60 graduate students. He was the editor of volumes 1 and 2 of the book Manual de Fitopatologia (Plant Pathology Manual) in its last four editions, and the author of the book Doenças de Plantas Tropicais: Epidemiologia e Controle Econômico (Diseases of Tropical Plants: Epidemiology and Economic Control), a work praised by the eminent Prof. J.C. Zadoks in the book review section of the European Journal of Plant Pathology.

Prof. Bergamin actively participated in most of the Brazilian Congresses of Planty Pathology, whether as a speaker, panelist, or moderator in scientific sessions. He received numerous distinctions, including the Prêmio Paulista de Fitopatologia from the São Paulo Group of Plant Pathology, the Destaque da Fitopatologia and Álvaro Santos Costa awards from the Brazilian Society of Plant Pathology, the Destaque em Ciência award from the Government of the State of São Paulo, and the title of Fellow from the American Phytopathological Society.

Those who knew him and had the privilege of working with Armando Bergamin Filho will remember his commitment to high-quality science, his precise arguments supported by philosophy, his encouragement and support for colleagues, and his brilliant sense of humor. Many others who did not know him personally will benefit from his scientific contributions, disseminated through books, scientific journals, extension publications, lecture videos, and class recordings, among others. His teaching skills were always a highlight of his career and a source of inspiration for all his students.

Deeply respected by students and colleagues, Prof. Bergamin was also admired for his independent thinking, sharp analyses, and generosity of spirit. He leaves behind his wife, children, grandchildren, and countless friends. He is deeply missed by all of us.

ASSESSING DELIMITING STRATEGIES TO IDENTIFY THE INFESTED ZONES OF QUARANTINE PLANT PESTS AND DISEASES

A review by Jun Min Joshua Koh *et al.* titled "Assessing delimiting strategies to identify the infested zones of quarantine plant pests and diseases" was published on 15 February 2025 by *Scientific Reports* (vol. 15, Article No. 5610 (2025)). The abstract is as follows:-

Following the discovery of a quarantine plant pest or disease, delimitation is urgently conducted to define the boundaries of the infested area, typically through surveys that detect the presence or absence of the pest. Swift and accurate delimitation is crucial after a pest or pathogen enters a new region for containment or eradication. Delimiting an area that is too small allows the pest to spread uncontrollably, while delimited areas that are too large can lead to excessive economic costs, making eradication cost-prohibitive. Despite its significance, there is a lack of comprehensive reviews on delimiting strategies and their effectiveness in managing plant pests; many current practices are ad-hoc and not scientifically based. In this study, we used an individual-based model to simulate the spread of Huanglongbing (citrus greening), a priority EU pest, and evaluated three delimiting strategies across various host distribution landscapes. We found that an adaptive strategy was most effective, especially when tailored to the polycyclic nature of the pest. This underscored the need for specific delimiting approaches based on the epidemiological characteristics of the target pest.

Read paper.

BROWN SPOT OF RICE

A review by Kouka Hilaire Kaboré *et al.* titled "Brown spot of rice: Worldwide disease impact, phenotypic and genetic diversity of the causal pathogen *Bipolaris oryzae*, and management of the disease" was published on 28 February 2025 by *Plant Pathology* (early view). The abstract is as follows:-

Rice brown spot caused by *Bipolaris oryzae* (syn. *Cochliobolus miyabeanus*) is a re-emerging disease worldwide. Under natural conditions, the disease causes approximately 4% in grain yield losses, ranging from 1% to 34% in countries of Africa and Asia. Rice seeds can be infected from relatively low (0.5%) to high (76%) rates. *B. oryzae* also infects wild rice (*Oryza australiensis*, *Oryza latifolia* and *Oryza rufipogon*) and other plant species, some of which are found in rice fields as alternative hosts. Characterisations of the pathogen's morphology, pathology and genetic diversity have been performed in several studies. *B. oryzae* colonies showed a wide range of colours varying from black to white and olive when grown on standard culture media. Strains isolated from rice are generally virulent with diverse aggressiveness, even within populations of the same geographic area. Clonal reproduction is predominant during epidemics. However, a low clonal fraction and balanced mating types suggest that sexual reproduction could take place in some areas. Most field studies reported high levels of pathogen genetic diversity and low population structure, suggesting that gene flow occurs between and among populations. Of the different methods used to control brown spot of rice, integrated management based on the use of healthy seed, resistant/tolerant varieties, balanced nitrogen fertilisation and water supply is preferred. This review reveals that a more precise estimation of the losses that this disease inflicts on rice production is needed. It also points out that knowledge of the population biology of the pathogen and epidemiological studies are required.

Read paper.

THESE BACTERIA PERFORM A TRICK THAT COULD KEEP PLANTS HEALTHY

MOLLY SHARLACH, PRINCETON ENGINEERING NEWS, 2 JANUARY 2025

Now, engineers at Princeton have found an answer in an unexpected place: the harmless, or sometimes beneficial, bacteria that cluster around plants' roots.

In an article in the journal *Cell Reports*, researchers showed that some types of soil bacteria can influence a plant's balance of growth and defense. The bacteria produce an enzyme that can lower a plant's immune activity and allow its roots to grow longer than they would otherwise.

Assistant Professor Jonathan Conway (right) checks on Arabidopsis seedlings with Samuel Eastman and Kaeli Ficco (Photo: Sameer A. Khan/Fotobuddy).

"This is trying to get at a really big biological question where there are not good answers — about how microbiomes interface with host immune systems," said senior study author Jonathan Conway, an assistant professor of chemical and biological engineering. "It's a small step in the direction of trying to understand how microbes live on hosts — either plants or humans or other animals — all the time and don't activate our immune responses constantly."

To search for immune-balancing bacteria, Conway's team turned to plants that were engineered to have heightened immune responses to a protein that makes up the threadlike appendages, called flagella, that allow bacteria to swim. The protein that makes up flagella, called flagellin, is a potent trigger of immune responses in hosts from plants to humans.

The researchers grew seedlings of *Arabidopsis* — a small plant in the mustard family that's commonly used in plant research — from a line that was engineered to produce high levels of flagellin-sensing immune receptor in its roots. When grown on plates containing the piece of flagellin that activates this receptor, the seedlings' roots are short and stubby, since their energy is directed toward immunity more than growth.

The experiment involved growing the seedlings on plates with flagellin as well as with 165 different bacterial species isolated from the roots of soil-grown *Arabidopsis*. 68 of these isolates, or 41%, suppressed the stunted growth response by tamping down the plants' immunity and allowing their roots to grow longer.

One of the bacterial species that allowed the roots to grow the best was *Dyella japonica*. Previous work had shown that that this species' immune-modulating activity was dependent on a bacterial secretion system — a protein complex that can move substances out of bacterial cells and into the environment, including inside plant cells or the spaces between plant cells.

A scan of *D. japonica*'s genome revealed a gene encoding a secreted enzyme called a subtilase, with the potential ability to chop flagellin into small pieces and prevent it from activating the immune response.

The team used both genetic and biochemical methods to demonstrate that the subtilase enzyme was indeed capable of degrading the specific segment of flagellin that triggers the immune response. The degradation was sufficient to tamp down the immune response and allow for increased growth in *Arabidopsis* seedlings.

The researchers ran into some snags when trying to purify the subtilase enzyme, said Samuel Eastman, a co-first author of the paper and a postdoctoral research associate in Conway's lab. Obtaining pure protein is essential for definitively demonstrating an enzyme's function in a test tube.

In 2023, Eastman presented a poster on the project at a conference in Providence, Rhode Island, and was approached by Todd Naumann, a chemist at the USDA's Agricultural Research Service in Peoria, Illinois. Naumann said his experience suggested the enzyme could be purified from yeast cells, rather than bacteria.

Within a couple of months, Naumann had purified the protein and shipped it to Princeton. "Now we can do chemistry with it, and we can actually look at this in vitro," said Eastman. "We're able to achieve a level of investigation into this protein that wouldn't have been possible without that collaboration."

Naumann is a co-author on the paper, along with eight other Princeton researchers in addition to Eastman and Conway. The process of screening and verifying 165 bacterial isolates was a lengthy team effort, and six undergraduates were integral to this and other aspects of the work, said Conway. Britley Jones, a member of Princeton's Class of 2023, played a key role in screening the bacterial collection as part of her senior thesis.

Eastman shares lead authorship of the paper with postdoctoral research associate Ting Jiang and Kaeli Ficco, a 2024 Princeton graduate who is now a Ph.D. student at Cornell University. As part of her thesis, Ficco helped engineer mutant bacterial strains that demonstrated a genetic requirement for the subtilase gene in immune suppression and developed some of the experimental methods herself.

"I really liked how discovery-based the project was," said Ficco. "That definitely influenced my trajectory after Princeton." Now, she is beginning studies on the regulation of immunity by the human microbiome.

Beyond analysing the specific enzyme produced by *D. japonica*, the team found that similar genes are found in many common soil bacteria, and their assays showed that dozens of bacterial isolates could suppress flagellin-induced immunity.

Now, they would like to better understand why these enzymes may be advantageous to both bacteria and their plant hosts. One hypothesis is that chopping up the flagella of pathogens prevents them from moving and invading a plant's roots.

"So, in that way it could be suppressing pathogens as well as the plant immune system," said Eastman. An alternative hypothesis is that these enzymes are "suppressing the immune system so a pathogen could maybe go undetected and cause more disease than it would otherwise."

The latter scenario would be problematic in harnessing this phenomenon to improve growth in agricultural settings, because it could make plants more vulnerable to disease. So, more study is needed, said Eastman.

"We don't want to compromise the immune system, but we also want plants to save that immune response for when it matters," he said. "We want them to keep calm and keep growing."

CURRENT VACANCIES

No current vacancies.

ACKNOWLEDGEMENTS

Thanks to Prof Lilian Amorin, Mark Holderness, Grahame Jackson, Greg Johnson, and Prof Emeritus Larry Madden for contributions.

COMING EVENTS

International Organization of Citrus Virologists (IOCV) XXIII Conference
16 March – 20 March, 2025
Mildura, Victoria, Australia
Website: www.iocvaustralia2025.org.au

Joint meeting of the 70th Conference on Soilborne Plant Pathogens and the APS Pacific Division
25 March – 27 March, 2025
University of California, Davis, USA
Website: soilfungus.wsu.edu

International Symposium on Plant Pathogenic Sclerotiniaceae - BotryScleroMoni 2025. Joint meetings of XIX International *Botrytis* Symposium, XVII International *Sclerotinia* Workshop, and II International *Monilinia* Workshop
25 May – 30 May, 2025
Thessaloniki, Greece
Website: botryscleromoni.com

Australasian Plant Pathology Society Conference
26 May – 28 May, 2025
International Convention Centre at Darling Harbour, Sydney, Australia
Website: www.apps2025.org

14th Conference of the European Foundation for Plant Pathology (EFPP)
2 June – 5 June, 2025
Uppsala, Sweden
Website: www.efpp2025.com

XVII Working Group "Biological and integrated control of plant pathogens." From single microbes to microbiome targeting One Health.
11 June – 14 June, 2025
University of Torino, Torino, Italy
Contacts: Davide Spadaro and Monica Mezzalama
Email: iobc2025@symposium.it
Website: www.iobctorino2025.org

17th Congress of the Mediterranean Phytopathological Union - New phytopathology frontiers of research and education for plant health and food safety
7 July – 10 July, 2025
Ciheam-Bari, Italy
Contact and Email: Anna Maria D'Onghia
mpu2025@iamb.it
Website: www.mpunion.org

13th International Workshop on Grapevine Trunk Diseases
21 July – 25 July, 2025
Ensenada, Baja California, México
Contact and Email: Rufina Hernández
13iwgtd@cicese.mx
Website: 13iwgtd.cicese.mx

Plant Health 2025
2 August – 5 August, 2025
Honolulu, Hawaii
Website:
www.apsnet.org/meetings/annual/PH2025/Pages/default.aspx

Conference of the IOBC/WPRS Working Group "Integrated Protection in Viticulture"
13 October – 15 October, 2025
Mikulov, Czech Republic
Website: event.fourwaves.com/ipvc/pages

14th Arab Congress of Plant Protection Sciences
3 November – 7 November, 2025
Algeria city, Algeria
Contact and Email: info@acpp-aspp.com
Website: acpp-aspp.com

8th International Bacterial Wilt Symposium (IBWS)
22 March – 26 March, 2026
Wageningen, the Netherlands
Website: event.wur.nl/ibws2026

13th International Congress of Plant Pathology 2028
19 August – 25 August, 2028
Gold Coast, Queensland, Australia
Website: www.icpp2028.org

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY (ISPP)

WWW.ISPPWEB.ORG

The ISPP List is an e-mail list server which broadcasts messages and announcements to its subscribers. Its goal is to facilitate communication among members of the International Society for Plant Pathology and its Associated Societies. Advertised vacancies in plant pathology and ISPP Newsletter alerts are also sent to members of the ISPP List.

In accordance with the guidelines and recommendations established by the new EU General Data Protection Regulation 679/2016 (GDPR), the International Society for Plant Pathology has created a Privacy Information Notice containing all the information you need to know about how we collect, use and protect your personal data.

This policy explains when and why we collect personal information about our users, how we use it, the conditions under which we may disclose it to third parties, how we keep it safe and secure and your rights and choices in relation to your personal information.

Should you need further information please contact business.manager@issppweb.org

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