

Potato blight plight looks promising for food security

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Over 160 years since potato blight wreaked havoc in Ireland and other northern European countries, scientists funded by the Biotechnology and Biological Sciences Research Council (BBSRC) finally have the blight-causing pathogen in their sights and are working to accelerate breeding of more durable, disease resistant potato varieties.

Using pathogen genomics, Professor Paul Birch from the Division of Plant Sciences, University of Dundee (at Scottish Crop Research Institute - SCRI), alongside researchers from Warwick HRI and the University of Aberdeen, is looking at how the most significant potato pathogen, *Phytophthora infestans* causes disease and identifying essential pathogen virulence genes that may be durable targets for host resistance proteins.

Costs associated with crop losses and chemical control of blight exceed £3billion globally each year. Professor Birch, explained: "What we have seen is an evolutionary arms race between a pathogen and its host and, so far, the pathogen has been winning."

However, this looks set to change as a result of greater understanding of the role of so-called effector proteins, which are secreted by the pathogen and go onto manipulate the plant cell structure, defences and metabolism to establish disease.

The discovery of more than 500 genes encoding these effectors, along with recent advances in technology to study protein-protein interactions

provides an unparalleled opportunity to investigate how plant defences are suppressed by invading microbes.

Within these effector proteins, Professor Birch and his colleagues have discovered a genetic motif - RXLR, which is necessary for the *P. infestans* pathogen proteins to enter the potato cells.

"We are really excited by the discovery of RXLR. This has provided a signature to search for proteins that are delivered inside host cells, where they may be exposed to plant defence surveillance systems," said Professor Birch.

The scientists hope that their understanding of how effectors interact with their targets in the host will lead to novel strategies to control or prevent crop losses and environmental damage for a wide variety of plant diseases, not just [potato](#) blight.

Commenting on the research, BBSRC Chief Executive Professor Doug Kell, said: "Potatoes are the third most important food crop in the world, but blight continues to devastate crops worldwide, having huge economic and dietary ramifications. This exciting research highlights the invaluable role that genomics has to play in preventing crop losses in potatoes and other crops and helping to address the urgent issue of global food security."

Source: Biotechnology and Biological Sciences Research Council ([news](#) : [web](#))

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