

New research to help fight widespread potato disease

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Scientists have made a key discovery into the genetics of the bacteria that causes blackleg, an economically damaging disease of potatoes, that could lead to new ways to fight the disease. The researchers at the University of Cambridge, funded by the Biotechnology and Biological Sciences Research Council (BBSRC), found that if a particular gene is inactivated in the bacterium *Erwinia carotovora*, its ability to damage the plant and cause disease is severely impeded. The research was recently published in the *Journal of Bacteriology*.

Erwinia carotovora can cause disease in a wide range of plants, including carrots, tomatoes and onions, but is best known in temperate regions for causing blackleg and soft rot in potatoes. Its success partly lies in its ability to produce enzymes which break down its host's cell walls. The degraded cell walls provide nutrients to the bacterium, and so aid its survival and growth.

The Cambridge researchers discovered that if they inactivated a gene called *relA*, which helps the bacteria recognise when nutrients are running low, then the bacteria's ability to export enzymes to break down the plant's cell walls is also abolished.

Research leader Dr Martin Welch explains: "Blackleg is a significant economic problem, substantially reducing crop yields.

"We have shown that the production of cell wall degrading enzymes is genetically linked to not only signalling abilities but also to the

bacterium's nutritional status. This has important implications for researchers looking for new ways to control the disease. By improving our understanding of how *Erwinia carotovora* rots the plant, we can reveal additional, possibly novel targets for the eventual development of anti-rot agents. We have also opened up the potential to develop pesticides."

Dr Mike Storey, R&D Director of the British Potato Council, commented in response to the research findings: "Blackleg is one of the key diseases across all sectors of the British potato industry. The findings from the University of Cambridge are important as they could offer novel solutions, both to help store potatoes and to control the disease.

"Soft rots in particular are a concern for many crops going in store this season because of the warm and wet growing conditions. We rely on careful storage management as most varieties of potato have no inbuilt resistance to soft rot and there are no available pesticides."

Source: Biotechnology and Biological Sciences Research Council

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