Pathogen virulence proteins suppress plant immunity

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Researchers from the Virginia Bioinformatics Institute (VBI) at Virginia Tech and their colleagues have identified a key function of a large family of virulence proteins that play an important role in the production of infectious disease by the plant pathogen Phytophthora sojae.

VBI Professor Brett Tyler and members of his research group, along with researchers from Virginia Tech's Department of Plant Pathology, Physiology and Weed Science, Nanjing Agricultural University in China, and Wageningen University in The Netherlands, examined the function of the virulence (or effector) protein Avr1b in P. sojae and discovered that Avr1b is capable of suppressing an important process in plant immunity called programmed cell death. Programmed cell death is an in-built suicide mechanism that kills infected plant tissue and fills it with toxins so the pathogen can no longer feed on it. The work appears in the advance online edition of *The Plant Cell*.

P. sojae is an oomycete plant pathogen that causes severe damage to soybean crops, resulting in $1-2 million in annual losses for commercial farmers in the United States and much more worldwide. By changing key amino acid residues in the effector protein, the researchers were able to attribute the cause of the suppression of programmed cell death to the presence of two conserved sequences (dubbed W and Y motifs) at one particular end of the protein, the C-terminus. These amino acid sequences are also present in many other members of a huge virulence gene superfamily that Tyler's group found recently in oomycete pathogens. (2)

According to VBI Professor Brett Tyler, “Our results suggest that, like many human viruses such as HIV, oomycete plant pathogens disable the immune systems of their victims as part of their infection strategy.”

Source: Virginia Tech