

Halterman, D. and Chen, Y. 2010. Molecular interactions determining broad-spectrum partial late blight resistance in potato. *Phytopathology* 100:S46.

The potato late blight resistance (*R*) gene *RB* (*Rpi-blb1*) belongs to the valuable class of plant *R* genes that confer resistance to a broad spectrum of pathogen isolates. RB protein recognizes the presence of members of the *Phytophthora infestans* effector family IPI-O to elicit resistance. We have studied *IpiO* diversity from 40 different *P. infestans* isolates collected from Guatemala, Thailand, and the United States. We have found that all of the isolates contain IPI-O variants that can be recognized by RB. However, some of these isolates contain an extraordinarily large number of variants. A few isolates also contain an IPI-O variant (IPI-O4) that is not recognized by RB. Isolates containing IPI-O4 are able to overcome resistance in RB-containing potato leaves to cause significantly more disease than isolates that do not contain IPI-O4, even when other IPI-O proteins are present. We show that the presence of IPI-O4 blocks the ability of RB to recognize the presence of other IPI-O variants through direct interaction with the resistance protein, thereby preventing programmed cell death related to the resistance response.