



TECHNOLOGY

Novel Strategy for Broad-Spectrum Disease Resistance Directed to the Host-Pathogen Interface by RPW8

OVERVIEW

Background

The severe damage to plants, especially cultivated food and cash crops due to fungal infections has serious economic consequences worldwide. One of the new innovative techniques to combat disease resistance in plants employs the naturally evolved plant disease resistance (R) genes. Most R genes are highly specialized in activating resistance to only one or a few strains of a particular pathogen, which is not a long term or practical solution. Therefore, there is an urgent need for engineering broad-spectrum disease resistance in crop plants.

Innovative Technology

Researchers at the University of Maryland have developed a novel method of inducing disease resistance against a wide variety of haustorium forming fungal and oomycete (water molds and downy mildews) pathogens. The haustorium is a pathogen feeding structure that penetrates a host's or plant tissue and absorbs water and nutrients. The powdery mildew resistance protein, RPW8 is specifically targeted to the extra-haustorial membrane (the host-pathogen) interface. This technology utilizes the disease resistant RPW8 as a delivery vehicle to target antimicrobial proteins to the extra-haustorial membrane, thereby inducing more effective resistance against haustorial invasion. This technique ensures that the plant is able to defend against different kinds of haustorium-forming pathogens such as powdery mildew, rust fungi and oomycetes.

Advantages

1. Environmentally friendly compared to the conventional method of using fungicides to treat fungal and oomycete infections
2. Compared to typical R gene-mediated disease resistance, resistance engineered by this method can be broader-spectrum, more durable and more effective

Applications

1. Generation of durable, cost-effective and broad spectrum disease resistance against infections caused by different type of (haustorium forming) pathogens such as powdery mildew in a variety of food and ornamental plants (wheat, barley, potato, tomato, cucumber, apple, grape, strawberry, rose etc.)

Current IP status: Patent Pending

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Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

Pending

LICENSE STATUS

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CATEGORIES

- Agricultural

EXTERNAL RESOURCES

- [US Patent 9,057,077](#)

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