Fall 10-10-2018

Science in the News - Newly discovered enzyme is 'firing pin' for plant immunity

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10-10-18

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http://blogs.ucdavis.edu/egghead/2018/09/17/newly-discovered-enzyme-firing-pin-plant-immunity/

Crop protection is extremely essential in feeding the ever-growing world population. Just like humans, plants have an immune system to fight off some infections, but at the same time lack antibodies and the ability to resist the same bug in later on in life (Fell). Instead, plant cells can recognize pathogens and react to them to produce a burst of reactive oxygen toxic to bacteria and fungi. Still, there has been some mystery on *how* these plants even respond to pathogens. I picked this article as finding the key steps to plant resistance could lead to interesting innovations in the agriculture world, possibly reducing the need for harsh bactericides.

According to Gitta Coaker and her colleagues from UC Davis, “Every plant cell can respond to pathogens through receptors on the cell surface that react to things like bacterial proteins” (Fell). Plants also have receptors similar to “Toll-Like Receptors” (TLRs), first discovered by Professor Pamela Ronald of UC Davis. TLRs are similar to proteins found in insects and mammals that trigger responses to bacteria and other pathogens (Fell). Interestingly, Coaker’s team isolated an enzyme called SIK1 found in the genus *Arabidopsis* that could be the striker for plant immunity, linking these receptors that recognize pathogens to the enzymes that produce toxic reactive oxygen (Fell).

In addition to having practical implications in the form of crop protection, this article can also be connected to the very nature of enzymes discussed in class. One feature that sets apart an enzyme from a chemical catalyst is its capacity for regulation. As shown by Fell, SIK1 links receptors to reactive oxygen enzymes, essentially regulating reactive oxygen production and plant therefore plant immunity.

As Coaker’s team discovered, deleting the gene that produced SIK1 caused the plants to produce minimal amounts of reactive oxygen, making them more vulnerable to infections. The team’s next goal is to find homologs of the SIK1 gene in crop plants, hopefully modifying the gene to create much more resilient crops.

The article provided by ScienceDaily does an adequate job at presenting the science behind how SIK1 works and its significance in crop immunity, although it is somewhat short in length. A diagram showing just how SIK1 links to receptors would have been extremely useful in developing a firm grasp of the science behind the enzyme, but the problem was remedied by Fell’s report on the study.

Sources

Fell, Andy. “Newly Discovered Enzyme Is ‘Firing Pin’ for Plant Immunity.” Egghead, 17 Sept. 2018, blogs.ucdavis.edu/egghead/2018/09/17/newly-discovered-enzyme-firing-pin-plant-immunity/.