To grow or to defend: How plants decide

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This is Dr. Cyril Zipfel and Rosa Lozano-Duran from The Sainsbury Laboratory. Credit: The Sainsbury Laboratory

Scientists have discovered how plants use steroid hormones to choose growth over defence when their survival depends on it.

The findings published in the open-access scientific journal *eLife* could be used to engineer crops that combine size with pathogen resistance.

"A major dilemma faced by plants is whether to invest their energy in growth or defending against pathogens," said Professor Cyril Zipfel from The Sainsbury Laboratory.

"Knowing how this is controlled adds a powerful tool in our ability to breed disease resistant plants with maximum yield."

A key protein, BZR1, is responsible for rapidly tipping the balance in favour of growth and ignoring pathogen attack when it is a matter of life and death. This is the case when a seed germinates in the soil, for example.

"Light is essential for plant's survival and the number one priority for a seedling is to reach sunlight," said Dr. Rosa Lozano-Durán, first author of the study from TSL.

"Investing the limited resources in fighting back a pathogen could have lethal consequences".

The protein identified controls the activity of genes related to immunity. It is involved in growth mediated by steroid hormones called brassinosteroids, which are common to all plants. Brassinosteroids are already the focus of studies to breed semi-dwarfed cereal crops. The current study shows that reducing their levels or their activity could have the added benefit of making crops better able to resist disease.

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