

Plant and microbe matchmaking for better bioenergy crops

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One of the proteins identified through a new ORNL-developed approach could be key to communications between poplar trees and beneficial microbes that can help boost poplar trees' growth, carbon storage and climate resilience. Credit: Andy Sproles/ORNL, U.S. Dept. of Energy

Oak Ridge National Laboratory researchers have identified specific proteins and amino acids that could control bioenergy plants' ability to

identify beneficial microbes that can enhance plant growth and storage of carbon in soils. The research is published in the *Computational and Structural Biotechnology Journal*.

These proteins, called LysM receptor-like kinases, regulate signaling between plants and microbes, a process that influences biomass production, root performance and carbon storage. The study showed these kinases potentially help poplar trees differentiate between helpful and disease-causing microbes.

With this information, scientists can better target bioengineering efforts aimed at promoting plant-microbe symbiosis to boost poplar trees' growth and sustainability in future climates.

"Having predictive insight into how receptors distinguish microbial friend from foe will reduce the number of design-build-test cycles needed to validate gene function and accelerate improvement of crop performance," said ORNL's Udaya Kalluri.

The novel method used computational structural biology in a multipronged approach that can accelerate gene function identification in a variety of plants.

More information: Kevin R. Cope et al, Exploring the role of plant lysin motif receptor-like kinases in regulating plant-microbe interactions in the bioenergy crop *Populus*, *Computational and Structural Biotechnology Journal* (2022). [DOI: 10.1016/j.csbj.2022.12.052](https://doi.org/10.1016/j.csbj.2022.12.052)

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