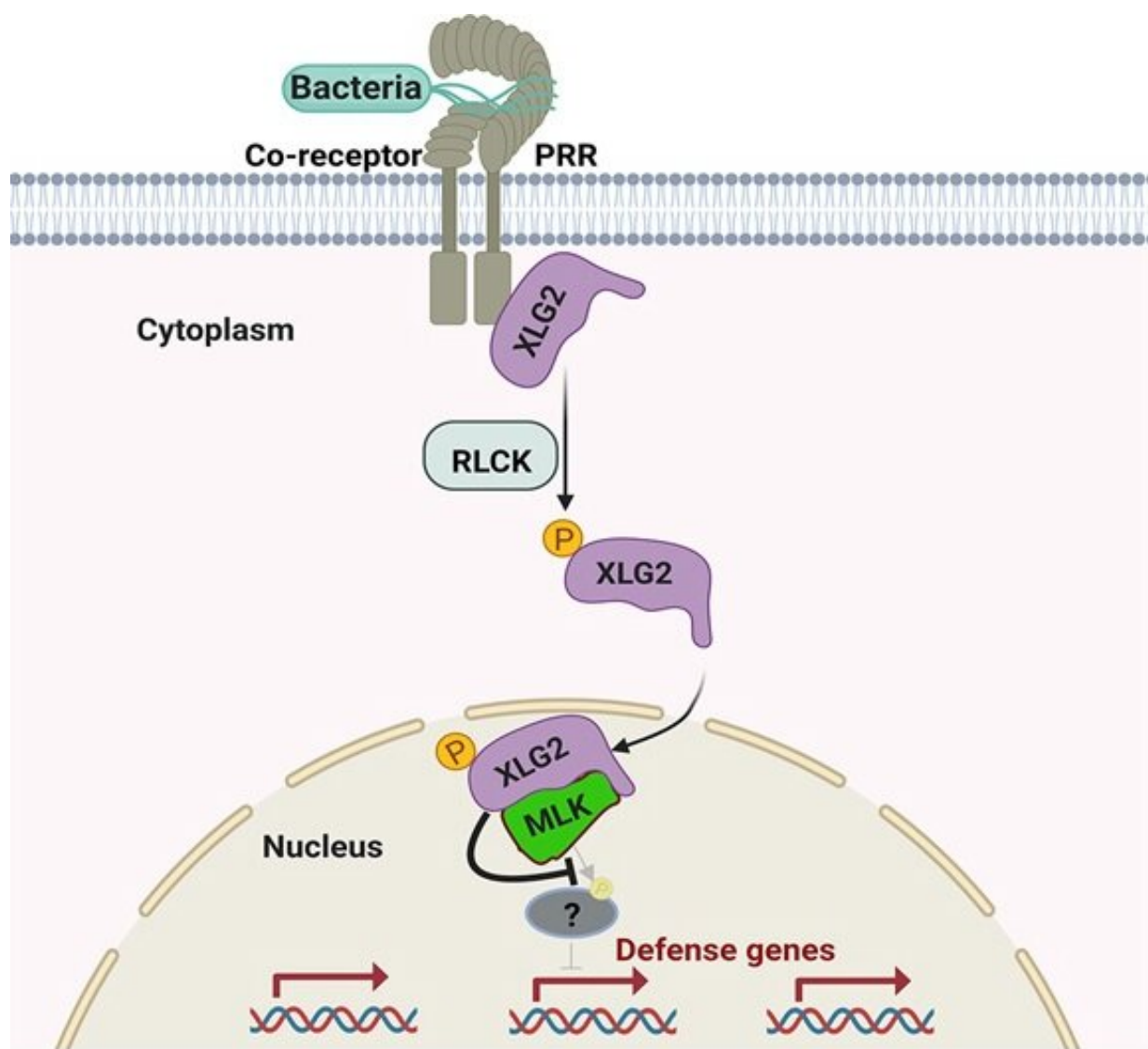


# Researchers discover new plant immune pathway based on G protein

October 19 2022, by Zhang Nannan



A model illustrating nuclear-localized XLG2 coordinated plant defended gene expression with MLKs. Credit: IGDB

Plant cell-surface localized immune receptors recognize conserved microbial features to perceive pathogen invasion and activate plant immunity. Heterotrimeric G proteins, which are composed of  $\alpha$ ,  $\beta$  and  $\gamma$  subunits, are widely found in eukaryotes and play important regulatory roles in eukaryotic cells.

Previously, a research team led by Prof. Zhou Jianmin from the Institute of Genetics and Developmental Biology (IGDB) of the Chinese Academy of Sciences has shown that plant-specific G $\alpha$  protein extra-large G protein 2 (XLG2) regulates [plant immunity](#) by directly coupling to immune receptors. Upon pathogen infection, XLG2 was phosphorylated by the central immune kinase receptor-like cytoplasmic kinases (RLCKs) at the N terminus. However, how XLG2 regulates immune receptor-mediated downstream immune signaling remained unknown.

In a new study published in *Cell Host & Microbe* on Oct. 13, the research team led by Prof. Zhou found that microbial patterns rapidly induce the nuclear accumulation of XLG2, which requires its nuclear-localization signal motif and phosphorylation sites of XLG2. They showed that the nuclear localization of XLG2 plays an important role in plant resistance to bacterial pathogens.

The researchers further identified that nuclear-localized XLG2 interacts with a family of kinase named Mut9-like kinases (MLKs). While MLKs negatively regulate defense gene expression in a kinase activity dependent manner, XLG2 de-represses immune response by inhibiting the kinase activity of MLK, and probably suppresses its phosphorylation on downstream unknown targets.

This study reveals a new pathway linking surface-localized [immune](#)

[receptors](#) and defense gene expression in the [nucleus](#), which might provide new clues for improvement of plant resistance. Meanwhile, this finding also greatly improves our understanding on heterotrimeric G protein-mediated downstream signaling in plants.

**More information:** Miaomiao Ma et al, A surface-receptor-coupled G protein regulates plant immunity through nuclear protein kinases, *Cell Host & Microbe* (2022). [DOI: 10.1016/j.chom.2022.09.012](https://doi.org/10.1016/j.chom.2022.09.012)

Provided by Chinese Academy of Sciences

Citation: Researchers discover new plant immune pathway based on G protein (2022, October 19) retrieved 26 April 2024 from <https://phys.org/news/2022-10-immune-pathway-based-protein.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.