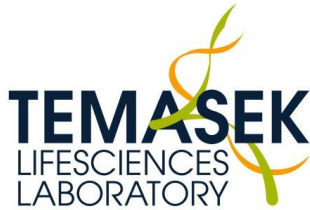


## PRESS RELEASE

### Scientists at Temasek Life Sciences Laboratory Discover a Novel Fungal Biocatalyst and Regulator that Shut Down Plant Immunity

**02 September 2015, Singapore** – Temasek Life Sciences Laboratory (TLL) is pleased to announce the breakthrough discovery on understanding a plant's natural response to a fungal infection. These findings have been published as a research article in the prestigious international journal *Nature Chemical Biology*.

Fungal pathogens significantly affect overall quality and productivity of important crops such as rice and wheat. Using the blast fungus *Magnaporthe oryzae* as a model for disease resistance research in rice, a team led by Dr Naweed Naqvi, Temasek Senior Investigator at TLL, unraveled a smart strategy used by the fungal pathogen to control immunity in rice by modifying the plant hormone jasmonic acid. This discovery stems from identifying a novel enzyme (*Antibiotic biosynthesis monooxygenase* or Abm) that is essential for virulence in the blast fungal pathogen. The team also discovered that the loss of Abm enzyme acts like a 'double-edged sword' as it impairs fungal invasion and enhances plant immunity. The novel biocatalyst and regulator: the Abm enzyme and its product 12-hydroxyjasmonic acid (12-OHJA), are secreted by the fungal pathogen during host penetration to evade the plant's natural defense response.



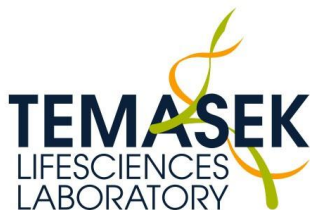
Plants resist fungal infection by activating a highly specific defense response based on jasmonic acid. The blast fungus showcases a fascinating interplay or “arms race” by secreting highly specific molecules such as Abm and 12-OHJA to suppress plant defense in order to establish the devastating blast disease.

According to Dr Naqvi, these findings represent an important breakthrough in understanding a plant’s innate immunity, which is the subject of intense research undertaken by many labs all around the world.

“The major focus of the Fungal Pathobiology research at TLL is to unravel the molecular mechanisms underlying such plant-pathogen interactions and devise tools for intervention of fungal disease in rice and other crops,” said Dr Naqvi. “We will be able to use the knowledge gained by understanding and interrupting the chemical communication between the plant host and fungal pathogen, to improve disease resistance and increase crop production.”

Professor Yu Hao, TLL Executive Director and Temasek Senior Investigator, says, “One of the key research areas at TLL is molecular pathogenesis, wherein our scientists devote much effort into understanding the molecular mechanisms of host-pathogen interaction. We foresee many potential applications for such findings from Dr Naqvi and his team in controlling fungal diseases and in enhancing flowering and tuberization in important food crops which contribute towards food security and sustainability in Asia and beyond.”

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**Citation:** Patkar R, Benke P, Qu Z, Chen Y, Yang F, Swarup S, Naqvi N. (2015) A fungal monooxygenase-derived jasmonate attenuates host innate immunity. *Nature Chemical Biology*, 11: 733–740 (doi:10.1038/nchembio.1885).

### **About Temasek Life Sciences Laboratory (TLL)**

TLL, established in 2002, is a beneficiary of the Temasek Trust and affiliated to the National University of Singapore and Nanyang Technological University. The research institute focuses primarily on understanding the cellular mechanisms that underlie the development and physiology of plants, fungi and animals. Such research provides new understanding of how organisms function, and also provides foundation for biotechnology innovation.

For more information, please visit [www.tll.org.sg](http://www.tll.org.sg).

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