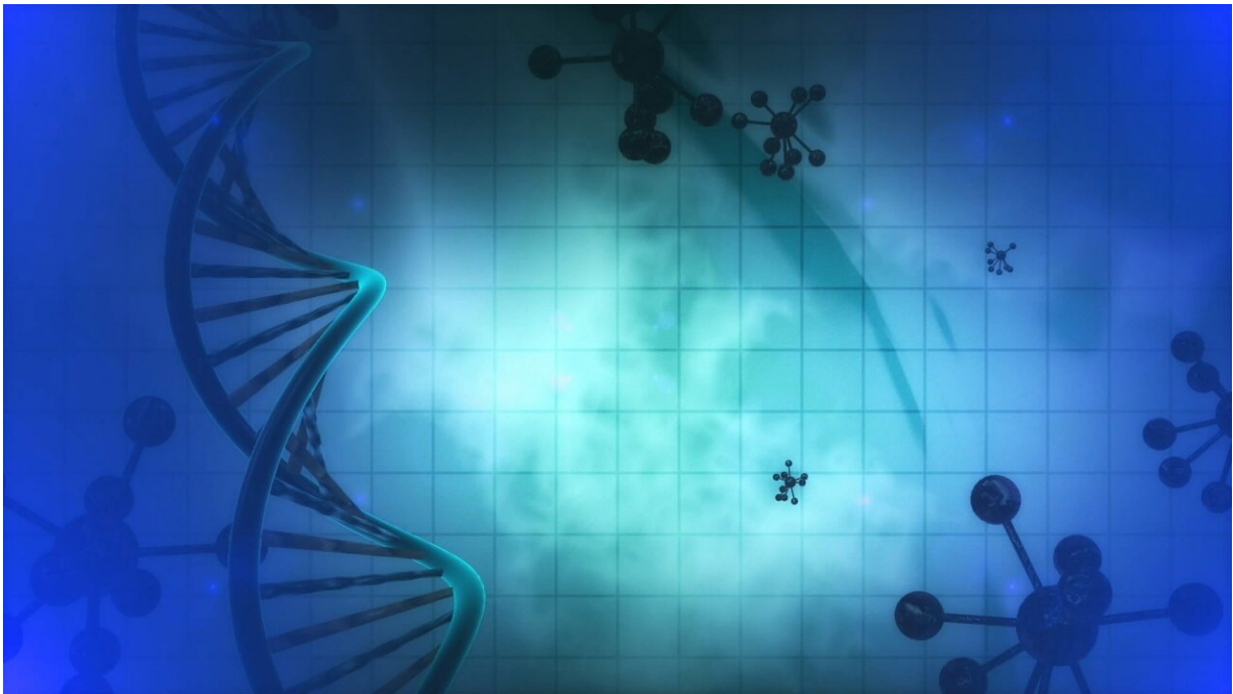


OsFIT and OsIRO2 interact to regulate iron homeostasis in rice

April 15 2020, by Zhang Nannan



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Iron (Fe) is necessary for plant growth and development because it is involved in many physiological and biochemical reactions. Fe deficiency can cause serious agricultural problems. It is well known that Fer-like Fe deficiency-induced transcription factor (FIT) is a key regulator of Fe uptake in Arabidopsis.

In response to Fe deficiency, plants modify the expression of numerous genes to maintain Fe homeostasis. However, the signal transduction network regulating the expression of Fe-homeostasis-associated genes has not been comprehensively characterized.

In a study published in *Journal of Integrative Plant Biology*, researchers from Xishuangbanna Tropical Botanical Garden (XTBG) identified the *Oryza sativa* FIT (also known as OsbHLH156) as the interacting partner of Iron-related bhlh transcription factor 2 (OsIRO2) that is a critical for regulating Fe uptake.

The researchers not only characterized the biological role of OsFIT and OsIRO2 and their [genetic relationship](#) in Fe homeostasis, but also revealed their molecular regulation mechanism.

To identify the interacting partners of OsIRO2, they used yeast two-hybrid (Y2H) assays and conducted the co-immunoprecipitation assays. They found that OsIRO2 physically interacted with OsFIT.

They further found that OsFIT promoted the nuclear accumulation of OsIRO2. Loss-of-function of OsFIT impaired tolerance to Fe limitation. Loss-of-function mutations of OsFIT disrupted the expression of Fe homeostasis-associated genes. Overexpression of OsFIT promoted Fe accumulation and expression of Fe-uptake genes.

Genetic analysis showed that OsFIT and OsIRO2 functioned as a transcription complex. OsFIT expression was positively regulated by OsPRI1, OsPRI2, and OsPRI3.

"Our data suggest that both OsFIT and OsIRO2 are required for the regulation of Fe uptake associated [genes](#), and they function as a transcription complex to regulate Fe homeostasis," said Dr. LIANG Gang, principal investigator of the study.

More information: Gang Liang et al. *Oryza sativa* Fer-like Fe deficiency-induced transcription factor (OsFIT/OsbHLH156) interacts with OsIRO2 to regulate iron homeostasis, *Journal of Integrative Plant Biology* (2020). [DOI: 10.1111/jipb.12933](https://doi.org/10.1111/jipb.12933)

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