

233. Introduction of a Transgene Regulation Strategy to Improve Lignin Engineering

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Project Goals: Lignin is the one of the major components that contribute to cell wall recalcitrance to degradation or cost-effective biofuel production. To achieve lignin reduction, while retaining some essential physiological functions, the development of sophisticated strategies for lignin engineering is required. One of such strategies is to ensure stringent spacio-temporal control of lignin modifying genes.

In the current study, we explored the possibility of employing a novel genetic regulatory devise to facilitate lignin engineering. By incorporating a synthetic intron cassette¹ into the transgene or its leading sequence, an artificial transcript editing control is introduced to add a regulatory switch in our engineered metabolic pathway in addition to promoter controls. The transcript editing control has been shown to improve the expression tuning by avoiding leaky expression of the transgene and has been applied to achieve promoter stacking for lignin engineering in a tissue specific manner.

Reference

1. Hickey, S. F., Sridhar, M., Westermann, A.J., Qin, Q. Vijayendra, P. L, Geoffrey Hammond, M.C. (2012) *Nucleic Acids Research* 40, 4701-4710

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