

Tissue specific promoters: the importance and potential applications for genetic engineering in oil palm

ABSTRACT

Oil palm is the most prolific oil crop in the world with a productive life span of 20-30 years and this perenniality bestows significant advantages over other oil crops. However, the industry still faces a number of challenges and to ensure its future sustainability, efforts must be made to diversify applications to increase its economic value. Amongst potential strategies include the use of genetic engineering approaches to fulfil the needs. To ensure that expression of transgenes for the production of genetically engineered products is directed to targeted tissue(s), promoter sequences that are responsible to direct the expression of desired genes have been identified. In this review we discuss the isolation and characterisation of oil palm tissue-specific promoters from mesocarp and kernel, an inducible tissue-specific promoter from roots, and the utility of constitutive promoters. The tissue-specific and constitutive functions of these promoters were confirmed through transient expression studies in oil palm and some of the isolated promoters were further characterised using *Arabidopsis* as a model system. We hope that these promoters can potentially be utilised to improve oil yield and quality, to fine tune the agronomic traits, and to generate high value-added products for the oil palm.

Keyword: Oil palm; Promoter; Transient assay