

Highly Efficient Isolation of *Populus* Mesophyll Protoplasts and Its Application in Transient Expression Assays

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- **Background:** *Populus* is a model woody plant and a keystone species in many temperate ecosystems. However, its lengthy life cycle impedes rapid characterization of gene function.
- **Science:** We optimized a *Populus* leaf mesophyll protoplast isolation protocol and established a *Populus* protoplast transient expression system.
- **Significance:** This study demonstrated the efficacy of using the *Populus* protoplast transient expression assay as an *in vivo* system for rapid characterization of gene function and pathways. Several current ORNL projects will benefit from this much-needed system for research in the post-omics era.

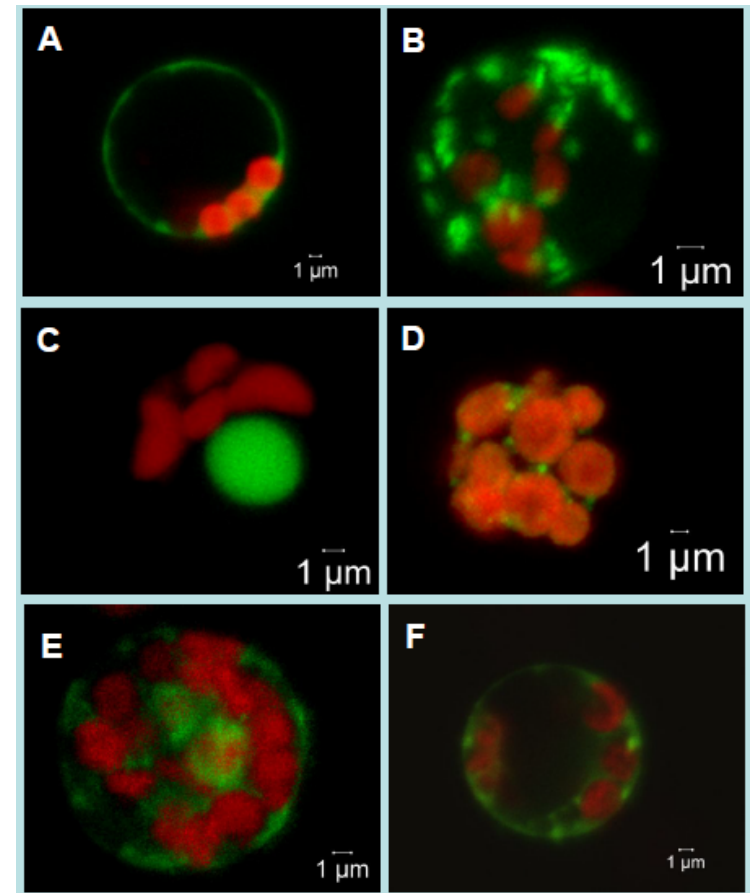


Figure 1. Transiently expressed organelle markers are correctly localized in the *Populus* protoplasts. A) Plasma membrane; B) Golgi; C) Nucleus; D) Peroxisome; E) ER; F) An ubiquitously-localized protein RACK1.

Guo J, Morrell-Falvey JL, Labbé JL, Muchero W, Kalluri UC, Tuskan GA, Chen JG (2012) *PLoS ONE*, accepted