

Breakthrough technologies to accelerate breeding and strain improvement in biological production for a sustainable society

Nanocarbon-initiated breeding toward increase in production of essential fatty acids

Project Leader : Kenichiro Itami

Director/Professor, Institute of Transformative Bio-Molecules (ITbM),
Nagoya University, Tokai National Higher Education and Research System



R&D Team : GRA&GREEN Inc.

Goal:

The project aims to create nanocarbon molecules with superior plant introduction and materials delivery characteristics. Nanocarbon molecules will be fused with the latest in plant science, developing a molecular breeding technology for perilla to result in an increased yield of mature seeds.

Research Overview:

The restricting factor in plant genetic engineering is the efficient introduction of genes. In this research, we will focus on nanocarbons, which have recently been reported to facilitate gene introduction, and develop an innovative genetic engineering introduction tool to include a nanocarbon molecule with superior plant cell introduction and transportation capabilities. To assess the innovative nanocarbon genetic engineering introduction tool, we will construct an evaluation system which imitates the outer structures of the plant (the waxy coating, cell wall and cell membrane). The selected introduction tool will be tested in model plants such as *Arabidopsis thaliana*, and in crops such as perilla.

In anticipation of this testing, the genome and transcript information of perilla will be collected. The production of this new, high-yield variety of perilla will be undertaken by a mixed group of chemists, biologists and agricultural scientists.

