

Genetic manipulation of *Chlamydomonas reinhardtii* chloroplast for CO₂-based PHB production이정섭, 심상준[†]

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The problem of waste plastic is emerging as an important environmental problem. To solve this problem, the use of biodegradable plastic is recommended. PLA has a problem that it is vulnerable to moisture and requires an additional process for biodegradation. PHB, another biodegradable plastic, has a wide range of applications because its properties such as melting point, crystallinity, and tensile strength are very similar to those of polypropylene. In addition, it is environmentally friendly because it can be decomposed naturally without a separate process. However, the current fermentation-based process, which is a method of producing PHB, is difficult to commercialize because there is a problem that the production cost of PHB increases by using refined sugar, an expensive raw material. This problem can be overcome by producing PHB using photosynthetic organisms that can utilize carbon dioxide contained in exhaust gases emitted by industries as a carbon source. In this study, an experiment was conducted to directly produce PHB from carbon dioxide by inserting the PHB gene into the chloroplast of the photosynthetic microorganism *Chlamydomonas reinhardtii*.