The comparison of promoter activity, using a simplified microalgal in-vitro transcription method

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The promoter activity is a key factor in a cell for the active growth of living things and mass production of useful materials. To investigate the promoter activity of eukaryotic cell, in-vivo transcription has been usually used. However, for the faster monitoring of genetic information processing, in-vitro transcription process is essentially needed, because eukaryotic cell grows up slowly. Here we compared the several promoters activities by a simplified microalgal in-vitro transcription. RNA polymerase and the other cofactors were seperated from the *chlamydomonas*'s cell lysate using MNP-DNA conjugates. Subsequently, concentration of mRNA produced by in-vitro transcription was measured by Qubit fluorometer. As a results, we could observe the changes in amounts of mRNA depends on the kinds of promoters. Thus, the best promoter could be selected. This system allows the fast, easy and economical analysis of promoter activity of microalgal under in-vitro transcription condition.