

## An analysis of CLE peptides as an morphogenes in plant morphogenesis

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### 【Outline of survey】

For many years, the plant phyto-hormones have been extensively studied as key regulators of plant growth and development. However, we discovered natural CLAVATA3 (CLV3)/ESR-related (CLE) peptide, CLV3, is dodecapeptide with two hydroxyproline residues that regulates meristem formation as a plant peptide hormone. This discovery allowed us to predict the chemical form of CLE gene products. In the Arabidopsis genome, there are 31 CLE genes that correspond to 26 CLE peptides. In this project, we will analyze 1; molecular mechanisms of CLE peptide signaling, 2; functional diversities of these CLE peptides, 3; functional and molecular evolution of these CLE peptides.

### 【Expected results】

In the plant morphogenesis, “morphogen” has not been identified, although many morphogens were found in animals. Morphogen make a gradation in a tissue giving local information in the morphogenesis of multi-cellular organisms.

In this project, we will analyze the CLV3 peptide movement in extra-cellular region of the plant shoot apical meristem, and we will try to identify the downstream of the CLV signaling. Together with other molecular analyses, we could show that the CLV3 function as a morphogen in plant morphogenesis.

### 【References】

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- Ito, Y., Nakanomyo, I., Motose, H., Iwamoto, K., Sawa, S., Dohmae, N., Fukuda, H. (2006) Dodeca-CLE peptides as suppressors of plant stem cell. *Science*, 313, 842-845

<b>【 Term of project 】</b> FY2007 - 2011	<b>【 Budget allocation 】</b> 18,900,000 yen (2007 direct cost)
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**【Homepage address】** <http://www.biol.s.u-tokyo.ac.jp/users/seigyolab.html>