1. Background of research
Cell surface transmembrane proteins that activates intracellular signaling upon binding to extracellular molecules such as hormones are defined as “receptors”. Extracellular molecules that specifically bind receptors are generally referred to as “ligands”. Because membrane-localized receptors act as master switches of complex intracellular signaling, identification of the ligand-receptor pair is one of the central issues of post-genome research.

2. Research objectives
We will clarify the mechanisms by which plant development is regulated through identification of novel ligands such as small peptides and their specific receptors by using Arabidopsis genome information, biochemical analysis and phenotypic observation.

3. Research characteristics (incl. originality and creativity)
Genetic redundancy often hinders our ability to dissect gene function by genetic approach. We will overcome this limitation by using biochemical approaches such as nano LC-MS-based high-sensitive peptide analysis system and expression library-based ligand binding assay.

4. Anticipated effects and future applications of research
Because low molecular weight ligands or their derivatives can be chemically synthesized, we expect that they can be used as plant growth regulators by the external application.