- Technology Presentation (1) -

Masahiro Kanaoka, Ph.D.

Challenges to understand and manipulate plant fertilization

Abstract:
Fertilization is a key process to produce siblings in organisms. In flowering plants, the male sperm cells are immobile and they are carried to female gametophyte by tip-growing pollen tube cell. The aims of our research are to understand the molecular signal that attracts pollen tubes to the ovule, and to manipulate plant fertilization through in vitro fertilization assay.
We have found that LURE proteins secreted from synergid cells of the ovule are responsible for pollen tube attraction to the female gametophyte. The sequences of LUREs vary between distantly related species such as *Torenia fournieri* and *Arabidopsis thaliana*. We also found key amino acid residues in LUREs that is required for species-specific pollen tube attraction.
To further analyze pollen tube attraction and plant fertilization, we chose tomato (*Solanum lycopersicum*) as a new model species for the assay. Because conventional pollen germination medium was not suitable for long-time incubation of pollen tubes and ovules, we established new culture medium for tomato. By using this medium, we have succeeded in pollen tube attraction to the ovule in vitro. In this talk, I will present recent our discoveries and discuss potential application of these results and techniques.

Biography:

2015-present	Cooperating Researcher, Lecturer, Institute of Transformative Bio-Molecules (ITbM), Nagoya University
2015-present	Lecturer, Graduate School of Science, Nagoya University
2013-2015	Cooperating Researcher, Assistant Professor, ITbM, Nagoya University
2007-2015	Assistant Professor, Graduate School of Science, Nagoya University
2006-2007	Research Associate, Department of Biology, University of Washington

Publications (selected)**:**

1) Okuda et al., Nature, 2009
2) Kanaoka et al., Annals of Botany, 2011
3) Horade and Kanaoka et al., RSC Advances, 2013
4) Kanaoka, Journal of Plant Research, 2018
5) Muro et al., Communications Biology, 2018