

■ Research Highlights

Uncovering the regulatory system of seed germination.

Abscisic acid (ABA) is a plant hormone that regulates seed germination and stress responses. Protein phosphatases functioning in the ABA response interact with ABA-receptor complexes.

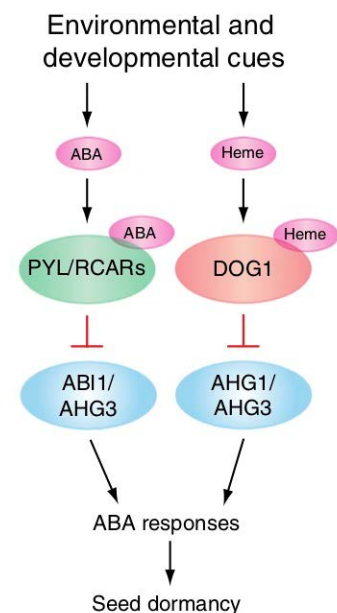
However, it is not known whether AHG1, a protein phosphatase of Arabidopsis, interacts with ABA-receptor and how AHG1 regulates the seed germination.

Now, Takashi Hirayama and colleagues at Okayama University, National Agriculture and Food Research Organization, The Scripps Research Institute, Nagoya University, University of California, San Diego report that AHG1 is involved in a novel regulatory system for seed dormancy and germination.

Search for AHG1 interacting proteins revealed that the protein DOG1—that is proposed to be a seed dormancy regulating protein—binds AHG1. The interaction between AHG1 and DOG1 was characterized further using various types of recombinant proteins both *in vivo* and *in vitro*.

These studies showed that interaction between AHG1 and DOG1 is necessary for their physiological functions. Further analysis showed that DOG1 inhibits AHG1 phosphatase activity *in vitro*. In addition, the *in vivo* and *in vitro* data suggest that coordination with heme regulates DOG1 function.

The regulatory mechanisms for seed dormancy and germination will enable improvements in seed quality, for example, through breeding wheat without pre-harvesting sprouting using this knowledge.



A hypothesized regulatory system of seed dormancy.

Reference:

- Authors: Noriyuki Nishimura, et al.
- Title of original paper: Control of seed dormancy and germination by DOG1-AHG1 PP2C phosphatase complex via binding to heme.
- Journal, volume, pages and year: *Nature Communications* **9**, 2132 (2018).
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- Affiliations: Institute of Plant Science and Resources, Okayama University.
- Department website: <http://www.rib.okayama-u.ac.jp/index-j.html>

