



Asst. Prof.
UTSUGI Shigeko



Study of factors related to seed dormancy and germination

Pre-harvest sprouting (PHS) is one of the most serious issues affecting cereal cultivation because it reduces the quality of crops. In some countries including Japan, high humidity and low temperature during the late ripening and harvesting of wheat seeds damages grains due to PHS. Therefore, the mechanisms underlying seed dormancy and germination need to be elucidated in more detail. I am analyzing some genes and proteins, MOTHER OF FT AND TFL1 (MFT) and bZIP transcription factors, which were upregulated after physiological maturity in dormant seeds.

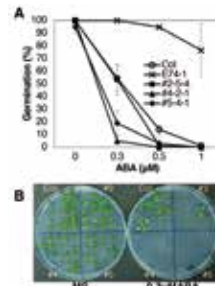
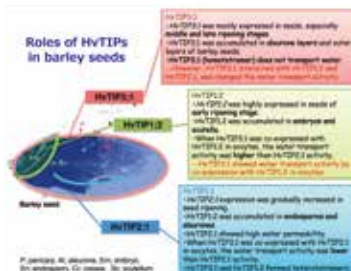


Figure 4. ABA sensitivity of WT and T4 seeds of TaABF over-expressed transformants in Arabidopsis.

Mechanisms of the water control by plant aquaporins



Most seeds form an embryo and store starch and nutrients, which are necessary for germination and development at the early stage, and are then desiccated and maintained under desiccated conditions until germination. This suggests the existence of some mechanisms to control the inner water condition of cells during the development and subsequent desiccation of seeds. I focus on water channels, especially tonoplast intrinsic proteins 3 (TIP3s), which highly accumulate in seeds during seed development and desiccation, and analyze its expression patterns and the regulation mechanisms of water transport activity.