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# GENOME-WIDE ASSOCIATION STUDY REVEALS CANDIDATE GENES RELATED TO LOW TEMPERATURE TOLERANCE IN RICE (*ORYZA SATIVA*) DURING GERMINATION

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**Introduction:** Direct-seeding has become increasingly popular and an inevitable trend in rice growing region due to its labor-saving and lower production costs. However, weak seedling establishment, slow and poor seedling emergence will cause yield loss, so that restrict the technique's application and popularity. In rice, mesocotyl as a primary organ for seedling emergence can push the shoot tip toward the soil surface. Therefore, it is necessary to introduce mesocotyl elongation related genes into elite varieties and screen genetic resources of mesocotyl elongation to enhance seedling emergence.

**Methodology & Theoretical Orientation:** Mesocotyl length was measured in various rice accessions under agar condition and carried out association analysis to identify candidate genes related to mesocotyl elongation using a natural population comprising 137 rice cultivars and inbred lines selected from the Korean rice core set. Genome-Wide Associations Study (GWAS) using ~1.44 million high-quality SNPs, which were identified by re-sequencing all rice collections.

**Conclusion & Significance:** Our research identified some mesocotyl elongation related novel candidate genes and their substantial natural variations in rice seedling emergence stage. The revealed candidate genes of mesocotyl elongation would provide valuable resources for molecular breeding and genetic improvement of the seedling emergence after direct seeding.

## Biography

Soon-Wook Kwon has been an associate professor in Pusan National University since 2013. He has been studied in Rice Breeding with a focus on eating quality and abiotic stress and studied in Molecular Breeding in post-genomic era. He received a B.A, M.S, and Ph. D from Seoul National University in 1999, 2002, and 2008, respectively. He also had involved in IRRI (International Rice Research Institute) as a Collaborator and Kongju National Univ. as a Post Doc.

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