**Supplementary file1.** List of germination-related MEGs

Germination-related MEGs identified in dormant seed coats.

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| **No**. | **Gene ID** | **Gene** | **Cluster** | **Role during germination** | **Mutant phenotype** | **Ref** | **Evidence** |
| 1 | AT2G03760 | AtSOT1, AtSOT12, ATST1, RAR047, SOT12, ST, ST1, sulphotransferase 12 | 1 | Negative regulator of ABA signaling in seeds. | Germination hypersensitive to NaCl and ABA | Baek et al., 2010 | **Direct** |
| 2 | AT2G18980 | Peroxidase superfamily protein | 1 | Negative regulator of dormancy release. Reactive Oxygen Species (ROS) play key roles in dormancy release and seed germination. Peroxidase activity accompanies endosperm rupture in tomato. H2O2 inhibits ABA-dependent repression of endosperm rupture. | Seeds less dormant than WT | Linkies et al., 2010  El-Maarouf-Bouteau et al., 2008  Morohashi, 2002  Muller et al., 2009 |
| 3 | At4g01360 | BYPASS1-related protein, BPS3, BYPASS3 | 1 | Positive regulator of germination. *Arabidopsis* mutants with defects in the *BYPASS1* (*BPS1*) gene overproduce an active mobile compound that moves from the root to the shoot and inhibits growth. | Triple *bps1/bps2/bps3* mutant germinates less well than WT | Lee et al., 2012 |
| 4 | AT4G15230 | ATPDR2, PDR2, pleiotropic drug resistance 2 | 1 | Negative regulator of germination. ABA transporter that controls Arabidopsis seed germination. | Seeds less dormant | Kang et al., 2015 |
| 5 | AT4G36880 | CP1, cysteine proteinase1 | 1 | Positive regulator of germination. Germination-specific cysteine protease expressed during the early phase of germination, involved in CRCs degradation in Arabidopsis endosperm. | Delayed CRCs mobilization | Tsuji et al., 2012  This study |
| 6 | AT5G39340 | AHP3, ATHP2, histidine-containing phosphotransmitter 3 | 2 | Positive regulator of germination. Involved in cytokinin-antagonized ABA effects on cotyledon greening. | Double mutant hypersensitive to ABA during germination | Guan et al., 2014  Nishiyama et al., 2013 |
| 7 | AT5G64620 | ATC/VIF2, C/VIF2, cell wall / vacuolar inhibitor of fructosidase 2 | 2 | Negative regulator of germination. Arabidopsis cell wall invertase inhibitor AtCIF1 plays a role in seed germination and early seedling growth. | Insensitive to ABA during germination | Su et al., 2016 |  |

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| **No**. | **Gene ID** | **Gene** | **Cluster** | **Potential role during germination** | **Mutant phenotype** | **Ref** | **Evidence** |

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| 8 | AT1G08920 | ESL1, ERD (early response to dehydration) six-like 1 | 1 | *ESL1* is induced by osmotic stress and ABA. | ND | Kiyosue et al., 1994  Yamada et al., 2010 | **Indirect** |
| 9 | AT1G62200 | NRT1/ PTR FAMILY, putative peptide/nitrate transporter | 1 | Nitrate releases seed dormancy in Arabidopsis by lowering ABA levels in imbibed seeds. | ND | Bethke et al., 2006  Matakiadis et al., 2009  Osuna et al., 2015  Albertos et al., 2015 |
| 10 | AT2G28550 | RAP2.7, TOE1, related to AP2.7 | 1 | AP2 TFs participate in ABA and osmotic stress signaling. AP2 domains are found in EREBP (ethylene responsive element binding protein). Ethylene interferes with ABA signaling. TOE1 binds to the *FT* promoter regulating *FT* mRNA. | ND | Zhang et al., 2015 |
| 11 | AT3G09190 | Concanavalin A-like lectin family protein | 2 | Arabidopsis A4 subfamily of lectin receptor kinases negatively regulates ABA responses in seed germination. | ND | Xin et al., 2009 |
| 12 | AT2G46650 | ATCB5-C, B5 #1, CB5-C, cytochrome B5 isoform C | 1 | Sucrose transporter SUT4 interacts with Cyb5 to mediate sucrose and glucose signaling in the sucrose/glucose-induced inhibition of seed germination. | ND | Li et al., 2012 |
| 13 | AT4G04955 | ALN, ATALN, allantoinase | 1 | Allantoinase regulates abiotic stress tolerance through activation of abscisic acid metabolism | ND | Watanabe et al., 2014 |
| 14 | AT4G30280 | ATXTH18, XTH18, xyloglucan endotransglucosylase/hydrolase 18 | 1 | GA induces XTHs in the micropylar endosperm during tomato seed germination to facilitate endosperm weakening. Induced in DELLA-dependent manner in Arabidopsis during germination. | ND | Chen et al., 2002  Cao et al., 2006 |
| 15 | At5g64120 | Peroxidase superfamily protein, AtPRX71 | 1 | AtPRX71 contributes to strengthen cell walls, therefore restricting cell expansion, during normal growth and in response to cell wall damage | ND | Raggi et al., 2015 |
| 16 | AT2G16660 | Major facilitator superfamily protein | 1 | Response to karrikins, seed germination stimulants found in smoke from wild fires. Target of PIF1 during germination. | ND | Nelson et al., 2010  Oh et al., 2009 |
| 17 | AT1G05000 | Phosphotyrosine protein phosphatases superfamily protein | 2 | Phosphotyrosine phosphatases are involved in ABA-dependent responses in Arabidopsis seeds | ND | Alonso-Ramiréz et al., 2011  Ghelis et al., 2008  Liu et al., 2015  Quettier et al., 2006  Reyes et al., 2006 |

ND- not determined

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Germination-related MEGs identified in non-dormant seed coats.

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| **No**. | **Gene ID** | **Gene** | **Role during germination** | **Mutant phenotype** | **Ref** | **Evidence** |
| 1 | At3g44730 | ATKP1, KP1, kinesin-like protein 1 | Involved in respiratory regulation during seed germination at low temperature | When grown at 4°C, KP1 dominant-negative mutants exhibit a higher seed germination frequency. *kp1* mutants had increased oxygen consumption during germination | Yang et al., 2011 | **Direct** |
| 2 | At5g63080 | HR demethylase JMJ20, JMJ20, JUMONJI DOMAIN\_CONTAINING PROTEIN 20 | Positive regulator of seed germination in the PHYB-PIL5-SOM pathway | Double mutant jmj20/jmj22 germinates less well than WT in phyB-dependent seed germination | Cho et al., 2012 |
| **No**. | **Gene ID** | **Gene** | **Potential role during germination** | **Mutant phenotype** | **Ref** | **Evidence** |
| 3 | At3g04080 | APY1, ATAPY1, apyrase 1 | Play a role in polar auxin transport. ABA represses growth of Arabidopsis embryonic axis by enhancing auxin signaling | ND | Liu et al., 2012  Belin et al., 2009 | **Indirect** |

ND- not determined

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