**Table S4. Node pairs connected by an equivalence relationship in the original model that are merged during reduction.**

All these edges are activating, e.g. A → B, where the regulatory function of B is fB = A, which means that A is both sufficient and necessary for B. In addition, B is the sole target of A. The merged node is labeled as “A→B” (third column). Any experiments that perturbed the state of the regulator node are equivalently reflected by the identical perturbation of the merged node. The fourth column lists and cites the experiments that perturb the eliminated regulator node. The fifth column lists the corresponding equivalent experiment in the reduced network involving the merged node. The sixth column lists and cites experiments that perturb the target node and the seventh column lists the equivalent experiment in the reduced network. There is a single experimental observation out of 18 (namely, close to wild type ABA sensitivity in case of GPA1) not equivalently reflected in the reduced network. This discrepancy is also present in the full model; it is not due to the reduction.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Regula-tor node** | **Target node** | **Notation of the merged node** | **Experimental evidence for the eliminated regulator node** | **Logically equivalent observation** | **Experimental evidence for the target node** | **Logically equivalent observation** |
| PtdIns(3,5)P2 | V-PPase | PtdIns(3,5)P2→V-PPase | PtdIns(3,5)P2 loss causes hyposensitivity to ABA [1] | PtdIns(3,5)P2→V-PPase KO causes hyposensitivity to ABA | V-PPase KO causes ABA hyposensitivity [1] | PtdIns(3,5)P2→V-PPase KO causes hyposensitivity to ABA |
| 8-nitro-cGMP | ADPRc | 8-nitro-cGMP→ADPRc | None | None | ADPRc KO causes hyposensitivity to ABA [2,3] | 8-nitro-cGMP→  ADPRc KO causes hyposensitivity to ABA |
| S1P[~SPP1,Sph] | GPA1[~GCR1] | S1P[~SPP1,Sph]→GPA1[~GCR1] | S1P CA causes hypersensitivity to ABA [4,5] | S1P[~SPP1,Sph]→GPA1[~GCR1] CA causes hyper-sensitivity to ABA | *GPA1* KO causes close to WT stomatal closure response to ABA [6] | S1P[~SPP1,Sph]→  GPA1[~GCR1] KO causes close to WT response to ABA |
| NOGC1 | cGMP[GTP] | NOGC1→cGMP[GTP] | *NOGC1* KO causes hyposensitivity to ABA [7] | NOGC1→cGMP[GTP] KO causes hyposensitivity to ABA | cGMP CA causes close to WT response to ABA [7] | NOGC1→cGMP[GTP] CA causes close to WT response to ABA |
| PI3P5K | PtdIns35P2→V-Ppase | PI3P5K→PtdIns35P2→V-PPase | *PI3P5K* KO causes hyposensitivity to ABA [1] | PI3P5K→PtdIns(3,5)P2→V-Ppase KO causes hyposensitivity to ABA | V-PPase KO causes hyposensitivity to ABA [1] | PI3P5K→PtdIns(3,5)P2→V-Ppase KO causes hyposensitivity to ABA |
| 8-nitro-cGMP→  ADPRc | cADPR{a} | 8-nitro-cGMP→  ADPRc→  cADPR{a} | ADPRc KO causes hyposensitivity to ABA [2,3] | 8-nitro-cGMP→  ADPRc→cADPR{a} KO causes hyposensitivity to ABA | cADPR KO causes hyposensitivity to ABA [2] | 8-nitro-cGMP→  ADPRc→cADPR{a} KO causes hyposensitivity to ABA |
| RBOH[RCN1]{b} | ROS{a} | RBOH[RCN1]{b}→ROS{a} | RBOH/RCN1 KO causes reduced sensitivity to ABA [8-10] | RBOH[RCN1]{b}→ROS{a} KO causes reduced sensitivity to ABA | ROS KO causes reduced sensitivity to ABA [10] | RBOH[RCN1]{b}→ROS{a} KO causes reduced sensitivity to ABA |
| SPHK1/2 | S1P[~SPP1,Sph]→  GPA1[~GCR1] | SPHK1/2→S1P[~SPP1,Sph]→[~SPP1,Sph]→GPA1[~GCR1] | SPHK1/2 CA causes hypersensitivity to ABA [11,12];  SPHK1/2 KO causes reduced sensitivity to ABA [11,12] | SPHK1/2→S1P[~SPP1,Sph]→[~SPP1,Sph]→GPA1[~GCR1] CA causes hyper-sensitivity to ABA;  SPHK1/2→S1P[~SPP1,Sph]→[~SPP1,Sph]→GPA1[~GCR1] KO causes reduced sensitivity to ABA | S1P CA causes hypersensitivity to ABA [4,5];  GPA1 KO causes close to WT response to ABA [6] | SPHK1/2→S1P[~SPP1,Sph]→[~SPP1,Sph]→GPA1[~GCR1] CA causes hypersensitivity to ABA;  SPHK1/2→S1P[~SPP1,Sph]→[~SPP1,Sph]→GPA1[~GCR1] KO causes close to WT response to ABA |

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