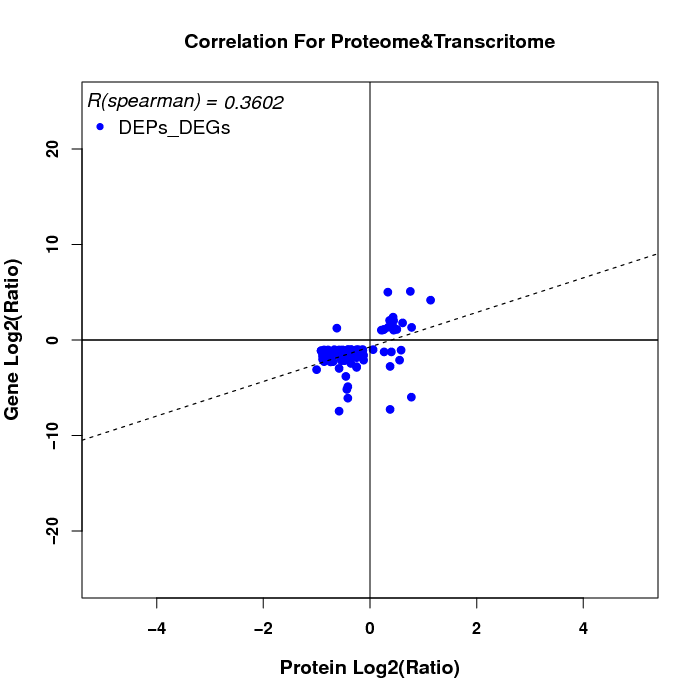
**

**Supplementary** **Figure 1.** The position of russeting in ‘Golden Delicious’ apple at DAF60: (A/D) stem hollow; (B/E) stalk; and (C/F) top of apple body. A, B, C belong to un-bagged fruits, shaort for CK group, and D, E, F belong to bagging fruits, shaort for T group.



**Supplementary** **Figure 2.** The formation process of russeting in ‘Golden Delicious’: (A/D) DAF30; (B/E) DAF60; and (C/F) DAF150. A, B, C belong to CK group, and D, E, F belong to T group.

**Supplementary** **Figure 3.** Thickness of the wax layer and size of the epidermal cells: (A): thickness of the wax layer at DAF30, DAF60, DAF150 of T and CK, respectively; and (B) size of the epidermal cells at DAF30, DAF60, DAF150 of T and CK, respectively. The different small letters within the same column means significant difference at P<0.05.



**Supplementary** **Figure 4.** The association diagram of DEGs and DEPs. R represents spearman correlation. The X-coordinate is the expression level of protein, and the Y-coordinate is the expression level of gene.



**Supplementary** **Figure 5.** Cluster analysis of quantitative DEGs and DEGs.



**Supplementary Figure 6. Phylogenetic analysis of LIM TFs.**

TCCTATTCCGAAGAAGGCAATGGTTTTCTTACTTTGTACTCCAAATTGACATCAACAAATGTTCA

TCCATGTCACCATTTATGTGGTTGCCCTCACCATTATAGATAACCAACACAGCCACGTATATTTA

TCTCATTAGATATAAGAGCAACTCCAGCGTATCAAATGCCCCTTAGGGTAACTTACTATTGAATC

CCCCAAGTGAACAATAAATGCCTTTAATGAACAGTAGCTGCCGTTGGATTAAAAAAATTTTGAAA

TCCAACCCTCCAGATTGTGCCACGTGGCACACGATAACATATCTGAATTTTTTAATGTGAATTTT

TTTTTTTAAATTTAAAGGCGAATAACTTGGACCGTTGATCTCAAATCCAATAGCTGATAAAAAAA

GTAACCGTTGAAATCCAATGGACGAGAACGTGCCAGCCCACCAACGGTAACATTTCAGCTGTCTG

CATCGCGGGCCCCATTGACTGAAAAGTTGTAGGTGACGCGCCCCCACGCGCACGTATGCGACACG

CGCCTGACGCAAATTTTTTTATACGTGGCTGACCATGCATCATTTGACCTTAGGCTCTCGGGCCA

CTGATTCGAGCCGGGCCTTTCACTCGGGCCCCCCTCAACCCAATTACCTGCATGGGCTGGAGCAA

GGAGCTGGGGCTATTGGGTCAAAAAAATTGCTTGTCCATCGGGCTATTGATCCCGGTGGAGTTGC

TCTAAGTGCCCCTCCTTATTCCATACACATACAAGTTGACCATAAATATTCATTTTATATATAGT

TTTTCCTTTTTCACACTAACAACAATCCCCACCAAACACTTTCATCTCCTCCTACCCCAGAAACC

CAAAGCAACCAACAAAGCATACGGTCGTCCAATCGTCCACCTCAGTAGCCACGTTGCAAGAACCT

PAL-box

CTCCACCGATGGATCATGCCACCATCGCACAGCTACATTGAATTTTCAACCAACCCGCGTGTGGC

TCTCTGCCACCCTTATGCTCACCTACCAAGCCACTTCCCAAATATGAGTCGTTTCAAAACCCCAT

TATA box

CCTTTCCTTCCACTTACCCCCTCCTCTCTATTTAAACCTCCTCCTCCCTCCCTCCACTCCTCAAA

AACCAACACTCCACCAACGGTCCACCACCACCTTTTTATCTTTTCACCACTTTCTTTAAACACCT

TCCTCGCTTCTACTTCCCTCGGTTTTTAGAGTTTTTGAGTTTTCAGTTTCTCGTAATTAAC

**Supplementary** **Figure 7.** Promoter analysis of MdPAL