

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Thermotolerance (F_v/F_m) assessments and genotypes based on the SNP (C/T) in intron 2 of TTC4 in 121 grapevine accessions.

File Name: Supplementary Data 2

Description: The fractions of the phenotypic variance for F_v/F_m .

File Name: Supplementary Data 3

Description: A total of 121 genes predicted by GWAS are listed.

File Name: Supplementary Data 4

Description: Only 97 GWAS-predicted genes were identified in the RNAsequencing data from the leaves of one-year-old *V. davidii* 'Tangwei' (TW, heat-tolerant) and *V. vinifera* 'Jingxiu' (JX, heat-sensitive) plants exposed to different temperatures.

File Name: Supplementary Data 5

Description: The TTC4^{TW} protein target genes identified by DAP-seq.

File Name: Supplementary Data 6

Description: Thermotolerance (F_v/F_m) assessments and genotypes based on the SNP (C/T) in intron 2 of TTC4 in 84 grapevine accessions grown in Beijing, China.

File Name: Supplementary Data 7

Description: Thermotolerance (F_v/F_m) assessments and genotypes based on the SNP (C/T) in intron 2 of TTC4 in 'Guipu 1', 'Cabernet Sauvignon', and their hybrid progenies grown in Nanning, China.

File Name: Supplementary Data 8

Description: Thermotolerance (F_v/F_m) assessments and genotypes based on the SNP (C/T) in intron 2 of TTC4 in 'Manicule Finger', '0940', and their hybrid progenies grown in Zhengzhou, China

File Name: Supplementary Data 9

Description: The primers used in this study.