

Table S1 Primer sequences used in this study

Gene name	Primer sequence (5'-3')
<i>AtGDH1</i>	F:AACCATGGCTTGGATTCTTG R:CACCAAGATCAATGGGCTTT
<i>AtGDH2</i>	F:AACCATGGCTTGGATTCTTG R:CACCAAGATCAATGGGCTTT
<i>AtPPC1</i>	F:CTTCGAAGCGTAAACCAAGC R:ATTGCTGATCCGAATCCAAG
<i>AtAK1</i>	F:TGCCATGATGAAGGAATTGA R:CCAGGATATCCCCATTTGTG
<i>AtACT2</i>	F: TCTGAAGGGTAAGTAGAGTAG R: ACTCAGCACATTCCAGCAGAT

Full sequences of the candidate genes were listed as follows:

>GDH1 CDS sequence

GLUTAMATE DEHYDROGENASE 1 AT5G18170

ATGAATGCTTTAGCAGCAACAAACAGAACTTCAAGTTAGCTGCTAGGCTTCTTGGTCTGGATTCTAAG
CTCGAGAAAAGTCTTCTCATCCCCTTCCGAGAAATCAAGGTGGAATGTACCATACCGAAAGACGATGGT
ACACTAGCATCATTCGTTGGGTTTCAAGTTCAACACGACAATGCAAGAGGTCCCATGAAAGGTGGAATC
AGATATCATCCTGAGGTTGATCCGATGAAGTGAACGCATTGGCTCAGCTCATGACATGGAAAACAGCA
GTGGCTAAGATTCTTACGGAGGAGCTAAAGGAGGGATTGGTTGTGATCCTAGCAAGCTCAGTATCTCC
GAGCTCGAGCGGTTGACTCGAGTTTTCACTCAGAAGATTCATGATCTCATTGGGATTCATACTGATGTT
CCAGCTCCAGATATGGGCACTGGTCCTCAGACAATGGCTTGGATTCTTGATGAATACTCTAAGTTTCAT
GGATACTCGCCTGCAGTTGTGACTGGAAAACCCATTGATCTTGGTGGATCGCTAGGGAGAGACGCGGCT
ACTGGAAGAGGAGTGATGTTTGGTACCGAAGCTTTGCTTAACGAGCACGAAAAGACCATATCAGGGCAG
CGTTTTGTCATCCAGGGATTTGGTAATGTGGGTTCTTGGGCGGCAAAGCTGATAAGTGAAGGGTGGG
AAGATTGTTGCCGTGAGTGACATTACCGAGCAATCAAGAACAAGGATGGTATCGATATCCCGGCCTTG
CTCAAGCATACTAAAGAACACAGAGGTGTCAAAGGGTTTGATGGTGCAGATCCGATCGATCCAACTCC
ATACTGGTTGAGGATTGTGATATCCTCGTCCCTGCAGCACTTGGTGGTGTGATCAACAGGGAGAATGCG
AATGAGATTAAAGCAAAGTTCATCATAGAAGCAGCTAATCATCCAACTGATCCGACGCGGATGAGATC
CTAAGTAAGAAAGGTGTGGTTATTCTCCCGACATATATGCAAACCTCTGGAGGAGTCACTGTAAGTTAC
TTCAATGGGTTTCAAGCATTCAAGGCTTTATGTGGGAGGAAGAGAAGGTGAACGATGAGCTAAAGACT
TACATGACTCGCTCTTTCAAGGACTTGAAAGAGATGTGCAAACTCACTCTTGGATCTCCGGATGGGA
GCTTTCACACTCGGTGTTAATCGTGTGGCTCAAGCTACCATTCTCAGAGGCTGGGGAGCTTAA

AtGDH1 RT F:AACCATGGCTTGGATTCTTG

AtGDH1 RT R:CACCAAGATCAATGGGCTTT

>GDH2 CDS sequence

GLUTAMATE DEHYDROGENASE 2

AT5G07440

ATGAATGCTTTAGCTGCAACAAACAGAACTTCCGTCATGCATCTCGAATCCTGGGTTTGGATTCTGAAG
ATCGAGAGAAGTCTTATGATCCCATTAGAGAAATCAAGGTTGAGTGTACGATTCTAAAGACGATGGC
ACTCTGGTTTCATACATCGGATTTAGGGTTCAACATGACAATGCTCGTGGACCCATGAAAGGTGGAATC
AGATATCATCCTGAGGTTGATCCAGATGAAGTTAACGCACTAGCTCAGCTGATGACTTGGAAGACTGCT
GTAGCAGATATTCCATATGGTGGTGCTAAAGGTGGAATTGGATGTAGTCCTCGTGACTTGAGTTTGAGC
GAGCTTGAGAGGTTGACTCGTGTGTTTACACAGAAGATTCATGATCTTATCGGTATTCATACCGATGTG
CCTGCTCCTGATATGGGCACTAACGCTCAAACCATGGCTTGGAATCTTGATGAGTACTCCAAGTTTCAT
GGTCATTCCCCTGCTGTTGTCACTGGAAAGCCCATTGATCTTGGTGGTTCATTAGGTAGGGAAGCTGCC
ACAGGTCGTGGTGTAGTATTTGCCACCGAAGCTCTTCTTGCTGAGTACGGGAAATCGATTTCAGGGTTTG
ACATTTGTTATTCAAGGTTTTGGGAATGTTGGAACATGGGCTGCGAAGCTGATCCACGAGAAAGGCGGT
AAAGTGGTTGCAGTAAGCGACATTACTGGTGCAATCAGGAACCCTGAAGGTATCGACATCAACGCTCTC
ATAAAACACAAGGACGCAACTGGAAGTCTCAATGATTTCAATGGTGGAGACGCTATGAATTCAGATGAA
TTGCTCATTTCATGAGTGTGATGTTCTCATTCCATGCGCTCTTGGTGGTGTCTCTGAACAAGGAAAAATGCT
GGAGATGTGAAGGCAAAGTTTATAGTAGAGGCAGCTAACCATCCAACAGATCCAGATGCTGATGAGATT
CTGTGAAGAAAGGAGTGATTATACTTCCAGATATCTACGAAACGCAGGAGGAGTGACAGTGAGTTAC
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GCTTTCACTCTTGGAGTTAACCGAGTCGCTCGAGCCACCCAGTTGCGTGGTTGGGAAGCTTAA

AtGDH2 RT F:AACCATGGCTTGGATTCTTG

AtGDH2 RT R:CACCAAGATCAATGGGCTTT

>AtPPC1

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GTTAGTGAAGACGACAAGCTTGTTGAGTATGATGCTTTGCTTCTAGATCGGTTTCTCGATATCCTCCAG
GATTTGCACGGTGAAGATCTCCGTGAAACTGTTCAAGAGCTTTATGAGCATTCTGCAGAATACGAAGGG
AAGCATGAACCTAAGAAGCTAGAGGAGCTAGGGAGTGTGCTAACGAGTTTAGATCCAGGAGATTCCATT
GTTATCGCTAAAGCTTTCTCTCATATGCTTAACTTAGCCAATTTGGCTGAGGAAGTGCAGATTGCTTAT
CGCCGTAGGATCAAGAAGCTGAAGAAAGGTGATTTTGTGATGAGAGCTCTGCTACTACTGAATCTGAT
CTTGAAGAACTTTCAAGAAGCTTGTTGGAGATCTGAACAAGTCTCCTGAAGAGATCTTTGATGCTCTC
AAGAATCAGACTGTGGATTTGGTTTTGACTGCTCATCCTACTCAGTCTGTGAGAAGATCATTGCTTCAG
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GAGCTCGATGAGGCTCTTCAGAGAGAGATTCAAGCTGCATTCCGAACAGATGAAATCAAAAGAACACCA
CCTACTCCTCAAGATGAGATGAGAGCGGAATGAGTTATTTCCATGAAACTATCTGGAAAGGTGTTCCCT
AAGTTTCTGCGCCGTGTTGACACGGCTTTGAAAAACATAGGGATCGAAGAACGTGTTCCATATAATGCT
CCATTGATTTCAGTTCTCTTCTTGGATGGGTGGTGATCGTGACGGTAACCCAAGGGTTACACCTGAAGTC
ACCAGAGATGTTTGCTTGTTAGCTAGAATGATGGCTGCTACTATGTACTTTAACCAATCGAAGATCTT
ATGTTTGAGATGTCTATGTGGCGTTGCAATGACGAGCTGCGTGCGGAGCTGATGAAGTTCATGCAAAAT
TCGAGGAAAGATGCTGCAAAACATTACATAGAATTCTGGAAGTCAATTCCCTACAACTGAGCCATACCGT
GTGATTCTTGGCGATGTAAGGGACAAGCTTTATCACACACGTGAACGCGCTCATCAACTGCTCAGCAAT

GGACACTCTGATGTCCCTGTAGAGGCTACTTTCATTAACCTTGAACAGTTCTTGGAACCTCTTGAGCTC
TGTTACCGATCTCTGTGTTTCATGTGGTGATCGTCCAATAGCAGATGGAAGCCTTCTTGATTCTTGAGG
CAAGTCTCAACCTTTGGGCTCTCTCTTGTGAGACTTGACATAAGGCAAGAATCTGACCGCCACACTGAT
GTATTGGATGCTATCACCACGCATTTAGATATCGGATCCTACAGAGAGTGGTCTGAAGAACGCCGCCAA
GAATGGCTTTTATCTGAGCTAAGTGCAAACGTCCGCTTTTCGGTTCTGATCTTCCTAAAACCGAAGAA
ATAGCTGATGTTCTGGACACGTTTCATGTCATAGCCGAGCTACCAGCAGATAGCTTTGGTGCTTACATT
ATCTCTATGGCAACTGCACCTTCTGATGTATTAGCTGTTGAGCTTTTACAGCGTGAATGCCGAGTGAAA
CAGCCTTTGAGAGTTGTTCCGCTCTTTGAGAAGCTAGCAGATCTGGAAGCAGCTCCTGCTGCAGTTGCT
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CATATGCTCCAAGATATGTACCAACACTGGCCTTTCTTTAGAGTCACCATTGATCTAATCGAAATGGTG
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GATCTTCTTGAAGGTGATCCTTACTTGAACAGAGACTGAGACTTCGTGATTCTTACATTACAACTCTC
AATGTCTGTCAAGCTTACACATTGAAGAGAATCCGTGATCCGAGTTACCATGTGACTCTGCGACCACAC
ATTTCTAAGGAGATAGCGGAATCGAGCAAACCAGCAAAAGAACTCATCGAGCTTAACCCGACTAGCGAA
TACGCGCCAGGACTTGAAGATACACTCATCTTGACGATGAAGGGTATTGCTGCTGGTCTACAAAACACC
GGTTAA

AtPPC1 RT F:CTTCGAAGCGTAAACCAAGC

AtPPC1 RT R:ATTGCTGATCCGAATCCAAG

>AtAK1

AT5G13280.1

ATGGCGGCTACTAGGGTTCGTTGTTGTCATAGCAATGCAGCTTTCACCAGATTGCCACTTACCCGCCAC
CGAAACTCGCCGACGCTACCGATTTCTCTAAATCGTGTCGATTTCCCTACGCTGAAGAAATTATCATTA
CCCATTGGAGATGGCTCCTCCATTAGAAAAGGTTTCAGGTTTCAGGCAGCAGAAAACATTGTGCGAGCTGTG
TTGGAAGAGAAGAAGACAGAGGCGATAACGGAGGTAGATGAGAAGGGTATCACGTGCGTGATGAAGTTT
GGTGGATCTTCGGTGGCGTCAGCTGAGAGAATGAAGGAAGTTGCTGATTTGATTTTGACTTTTCCGGAA
GAAAGTCCCGTCATTGTTCTCTCTGCTATGGGGAAAACTACCAACAATCTCTTGCTTGCGGGAGAGAAG
GCGGTTAGTTGTGGTGTCTTAATGCATCTGAGATTGAGGAGTTGAGCATTATAAAGGAATTGCATATC
AGGACGGTGAAAGAGCTCAACATTGATCCCTCTGTTATTTTGACCTATTTGGAGGAACTGGAGCAACTC
CTGAAAGGCATTGCCATGATGAAGGAATTGACACTTCGAACCAGAGATTACTTAGTCTCTTTTGGAGAG
TGTTTGTCTACAAGGATTTTGTCTGCTTATCTTAATACAATCGGTGTCAAGGCACGCCAATATGATGCA
TTTGAAATTGGTTTCATTACAACGGATGATTTACAAAATGGGGATATCCTGGAGGCAACTTATCCAGCT
GTTGCCAAGAGATTATATGATGATTGGATGCATGATCCTGCTGTTCCCTATTGTAACAGGTTTCCTTGGG

AAGGGTTGAAAACTGGTGCGGTTACTACCTTGGGTAGGGGTGGCAGTGATTTGACGGCAACCACAATT
GGTAAAGCGTTGGGTTTAAAAGAGATTCAGGTGTGAAAGATGTCGATGGTGTCTAACATGTGACCCT
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GGTGCACAGGTCTTGACCCACAGTCAATGAGACCAGCAAGAGAGGGTGAGATTCCTGTTAGGGTTAAA
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GTCAATGTCCAGATGATATCACAAGGAGCATCCAAGGTAAACATTTCCCTTTATAGTAAACGAAGCTGAA
GCTGAAGGTTGTGTTCAAGCTCTTCACAAATCCTTCTTCGAGAGCGGTGACCTCTCAGAGTTATTGATA
CAACCCAGACTTGGCAACGGGTCACCTGTCAGGACACTGCAAGTAGAAAAATTGA

AtAK1 RT F: TGCCATGATGAAGGAATTGA

AtAK1 RT R: CCAGGATATCCCCATTTGTG