

Supplemental Figure S4; Alignment of maize PPKD sequences and location of recovered peptides
Page 1

```
PPDK1P2 MAASVSRRAICVQKPGSKCTRDREATSFARRSVAAPRPPHAKARRRHPLRL
PPDK1P1 MAASVSRRAICVQKPGSKCTRDREATSFARRSVAAPRPPHAKAAGVIRSDS
PPDK1Cy -----
PPDK2 -----

PPDK1P2 RRG TGPHCSPLRAVVDAAPIQTTK--KRVFHFHGKSEGNKTMKELLGGK
PPDK1P1 GAGRGQHCSPLRAVVDAAPIQTTK--KRVFHFHGKSEGNKTMKELLGGK
PPDK1Cy -----MAPVQCARS-QRVFHFHGKSEGNKTMKELLGGK
PPDK2 -----MAPAPCGRSSQRVFHFHGKSEGNKTMKELLGGK
          **      :      :*****.*****

PPDK1P2 GANLAEMASIGLSVPPGFTVSTEACQQYQDAGCALPAGLWAEIVDGLQWV
PPDK1P1 GANLAEMASIGLSVPPGFTVSTEACQQYQDAGCALPAGLWAEIVDGLQWV
PPDK1Cy GANLAEMASIGLSVPPGFTVSTEACQQYQDAGCALPAGLWAEIVDGLQWV
PPDK2 GANLAEMASIGLSVPPGFTVSTEACQQYQEAGRALPPGLWAEVLDGLRWV
          *****: **  ** .***** : : ** : **

PPDK1P2 EEYMGATLGDPQRPLLLSVRSGAAVSMGMMDTVNLGLNDEVAAGLAAK
PPDK1P1 EEYMGATLGDPQRPLLLSVRSGAAVSMGMMDTVNLGLNDEVAAGLAAK
PPDK1Cy EEYMGATLGDPQRPLLLSVRSGAAVSMGMMDTVNLGLNDEVAAGLAAK
PPDK2 EEYMGAAALGDPRRPLLLSVRSGAAVSMGMMDTVNLGLNDQVAAGLAAK
          *****: *****: *****: *****

PPDK1P2 SGERFAYDSFRRFLDMFGNVMDIPRSLFEEKLEHMKESKGLKNDTDLTA
PPDK1P1 SGERFAYDSFRRFLDMFGNVMDIPRSLFEEKLEHMKESKGLKNDTDLTA
PPDK1Cy SGERFAYDSFRRFLDMFGNVMDIPRSLFEEKLEHMKESKGLKNDTDLTA
PPDK2 SGRDFAYDSFRRFLDMFGNVMDIPHALFEEKLEAMKKAAGLKNDTDLTA
          ** : *****: *****: ***** ** : : *****

PPDK1P2 SDLKELVGQYKEVYLSAKGEPFSPDPKKQLELAVLAVFNWSWESPRAKKYR
PPDK1P1 SDLKELVGQYKEVYLSAKGEPFSPDPKKQLELAVLAVFNWSWESPRAKKYR
PPDK1Cy SDLKELVGQYKEVYLSAKGEPFSPDPKKQLELAVLAVFNWSWESPRAKKYR
PPDK2 TDLKELVSQYKNVYVEAKGEPFSPDPKRQLELAVLAVFDSWESPRAKKYR
          : ***** . ** : ** : . ***** : ***** : *****

PPDK1P2 SINQITGLRGTA VNVQCMVFGNMGNTSGTGVL FTRNPNTGEKKLYGEFLV
PPDK1P1 SINQITGLRGTA VNVQCMVFGNMGNTSGTGVL FTRNPNTGEKKLYGEFLV
PPDK1Cy SINQITGLRGTA VNVQCMVFGNMGNTSGTGVL FTRNPNTGEKKLYGEFLV
PPDK2 SINQITGLRGTA VNVQCMVFGNMGNTSGTGVL FTRNPNTGEKKLYGEFLV
          *****

PPDK1P2 NAQGEDVVAGIRTPEDLDAMKNLMPQAYDELVENCNILESHYKEMQDIEF
PPDK1P1 NAQGEDVVAGIRTPEDLDAMKNLMPQAYDELVENCNILESHYKEMQDIEF
PPDK1Cy NAQGEDVVAGIRTPEDLDAMKNLMPQAYDELVENCNILESHYKEMQDIEF
PPDK2 NAQGEDVVAGIRTPEDLDAMKDVMPQAYKELVENCNILESHYKEMQDIEF
          ***** : : ***** . ***** . *****

PPDK1P2 TVQENRLWMLQCR TGKRTGKS AVKIAVDMVNEGLVEPRSAIKMVEPGHLD
PPDK1P1 TVQENRLWMLQCR TGKRTGKS AVKIAVDMVNEGLVEPRSAIKMVEPGHLD
PPDK1Cy TVQENRLWMLQCR TGKRTGKS AVKIAVDMVNEGLVEPRSAIKMVEPGHLD
PPDK2 TVQESRLWMLQCR TGKRTGKS AVKIAVDMVNEGLVERRAAIKMVEPGHLD
          *** . ***** ***** ***** * : *****

PPDK1P2 QLLHPQFENPSAYKDQVIATGLPASPGA AVGQVVF TAEDA EAWHSQ GKAA
PPDK1P1 QLLHPQFENPSAYKDQVIATGLPASPGA AVGQVVF TAEDA EAWHSQ GKAA
PPDK1Cy QLLHPQFENPSAYKDQVIATGLPASPGA AVGQVVF TAEDA EAWHSQ GKAA
PPDK2 QLLHPQFENPSAYKDQVIATGLPASPGA AVGQVVF TAEDA ETWHSQ GKSV
          ***** : ***** : .
```

```
PPDK1P2      IILVRAETSPEDVGGMHAAVGILTERGGMTSHAAVVARWWGKCCVSGCSGI
PPDK1P1      IILVRAETSPEDVGGMHAAVGILTERGGMTSHAAVVARWWGKCCVSGCSGI
PPDK1Cy      IILVRAETSPEDVGGMHAAVGILTERGGMTSHAAVVARWWGKCCVSGCSGI
PPDK2        IILVRAETSPEDVGGMHAAGILTERGGMTSHAAVVARWWGKCCVSGCSGI
*****.*****

PPDK1P2      RVNDAEKLVTIGSHVLRERGEWLSLNGSTGEVILGKQPLSPPALSGDLGTF
PPDK1P1      RVNDAEKLVTIGSHVLRERGEWLSLNGSTGEVILGKQPLSPPALSGDLGTF
PPDK1Cy      RVNDAEKLVTIGSHVLRERGEWLSLNGSTGEVILGKQPLSPPALSGDLGTF
PPDK2        RVNDAEKVVKIGGNVLRERGEWLSLNGSTGEVILGKQPLSPPALSGDLGTF
*****:*.*.*:*****

PPDK1P2      MAWVDDVRKLVLANADTPDDALTARNNGAQGIGLCRTEHMFASDERIK
PPDK1P1      MAWVDDVRKLVLANADTPDDALTARNNGAQGIGLCRTEHMFASDERIK
PPDK1Cy      MAWVDDVRKLVLANADTPDDALTARNNGAQGIGLCRTEHMFASDERIK
PPDK2        MSWVDDVRKLVLANADTPEDALAAARNNGAEGIGLCRTEHMFASDERIK
*:*****:***:*****:*****

PPDK1P2      AVRQMIMAPTLELRQQALDRLLTYQRSDFEGIFRAMDGLPVTIRLLDHPS
PPDK1P1      AVRQMIMAPTLELRQQALDRLLTYQRSDFEGIFRAMDGLPVTIRLLDHPS
PPDK1Cy      AVRQMIMAPTLELRQQALDRLLTYQRSDFEGIFRAMDGLPVTIRLLDHPS
PPDK2        AVRQMIMAPTVELRQQALDRLLPYQRSDFEGIFRAMDGLSVTIRLLDPPL
*****:*****.*****.*****

PPDK1P2      YEFLEPENGIEDIVSELCAETGANQEDALARIEKLESEVNPMLGFRGCRLLGI
PPDK1P1      YEFLEPENGIEDIVSELCAETGANQEDALARIEKLESEVNPMLGFRGCRLLGI
PPDK1Cy      YEFLEPENGIEDIVSELCAETGANQEDALARIEKLESEVNPMLGFRGCRLLGI
PPDK2        YEFLEPENGVEEIVRELCSSETGANQEDALARIEKLESEVNPMLGFRGCRLLGI
:*****:*.** ***:*****

PPDK1P2      SYPELTEMQARAI FEAAIAMTNQGVQVFPEIMVPLVGTPQELGHQVTLIR
PPDK1P1      SYPELTEMQARAI FEAAIAMTNQGVQVFPEIMVPLVGTPQELGHQVTLIR
PPDK1Cy      SYPELTEMQARAI FEAAIAMTNQGVQVFPEIMVPLVGTPQELGHQVTLIR
PPDK2        SYPELTEMQARAI FEAAIAMTNQGVQVFPEIMVPLVGTPQELGHQVALIR
*****:***

PPDK1P2      QVAEKVFANVGKTIGYKVGTMIEIPRAALVADEIAEQAEFFSFGTNDLTQ
PPDK1P1      QVAEKVFANVGKTIGYKVGTMIEIPRAALVADEIAEQAEFFSFGTNDLTQ
PPDK1Cy      QVAEKVFANVGKTIGYKVGTMIEIPRAALVADEIAEQAEFFSFGTNDLTQ
PPDK2        QVANKVFTSMGKTIGYKIGTMIEIPRAALVADEIAEQAEFFSFGTNDLTQ
***:***:..:*****:*****

PPDK1P2      MTFGYSRDDVGKFI PVHLAQGILQHDPFEVLDQRGVGVGELVKFATERGRKA
PPDK1P1      MTFGYSRDDVGKFI PVHLAQGILQHDPFEVLDQRGVGVGELVKFATERGRKA
PPDK1Cy      MTFGYSRDDVGKFI PVHLAQGILQHDPFEVLDQRGVGVGELVKFATERGRKA
PPDK2        MTFGYSRDDVGKFI PIYLAQGILQHDPFEVLDQRGVGVGELVKLATERGRKA
*****:;*****:*****

PPDK1P2      RPNLKVGICGEHGGEPSVAFFAKAGLDFVSCSPFRVPIARLAAAQVLV
PPDK1P1      RPNLKVGICGEHGGEPSVAFFAKAGLDFVSCSPFRVPIARLAAAQVLV
PPDK1Cy      RPNLKVGICGEHGGEPSVAFFAKAGLDFVSCSPFRVPIARLAAAQVLV
PPDK2        RPNLKVGICGEHGGEPSVAFFAKAGLDFVSCSPFRVPIARLAAAQVLV
*****:***:*****
```

Supplemental Figure S4. CLUSTALW alignment of maize PPDK isoforms. Two slightly different sequences are present in Genbank for the plastidial form of PPDK1, listed here as PPDK1P1 (Genbank accession no. P11155) and PPDK1P2 (Genbank accession no. AAA33495). PPDK1Cy is the cytosolic form of PPDK1 (Genbank accession no. AAB23731). The PPDK2 sequence is translated from Transcript Assemblies Database accession no. TA_164186_4577. Highlighted residues indicate peptide sequences from proteins that associate with starch biosynthetic enzymes (see Supplemental Table S1 for details). Grey highlights indicate peptides that are identical in both the PPDK1 and PPDK2 sequences, yellow highlights indicate peptides unique to PPDK1, and green highlights indicate peptides unique to PPDK2. The data indicate that both PPDK1 and PPDK2 associate with the starch biosynthetic enzymes.