

**Supporting Information S1.** This benchmark dataset  $S$  used in this study contains 978 plant protein sequences, or 1,055 locative proteins classified into 12 subcellular locations. Among the 978 different proteins, 904 belong to one subcellular location, 71 to two locations, and 3 to three locations. Both the accession numbers and sequences are given. None of the proteins has  $\geq 25\%$  sequence identity to any other in the same subset (subcellular location). See the text of the paper for further explanation.

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(1)  $S_1$ : 56 cell membrane proteins

>P25848

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>Q8LDP4

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>O80458

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FAFSTENWGRDKIEIDNLMSLIQH YRNKSNIKFFHRSEVRVSVIGNKTKIPESLLKEIHE  
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CRV

>P92939

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NCICLVTD TGMNTEIGRVHSQIQEAAQHEEDT PLKKKLNEFGEVLTMIIGLICALVWLIN  
VKYFLSWEYVDGWPRNFKFSFEKCTYYFEI AVALAVAAIPEGLPAVITTC LALGTRKMAQ  
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>Q94CC0

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>Q8L586

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## (6) $S_6$ : 22 extracellular proteins

>Q40966

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>P00693

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>Q9T0N8

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AVEPAPARARWVRFYTDFAAFSADQERLTAPRPGGGGASFGPMSYVEGSVFVNQSLATD  
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>P28493

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>P33154

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TQVVWRKSVRLGCAKVR CNNGGTII SCNYDPRGNYVNEKPY

>P93164

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GWAVSGPYLDTLGNIFKKALERN DAGDHFVIAFNLGGNLVIRIVSEQTDILEPFTASSL  
PSSLVLWNEANAKGSLFQRFPSDLLTQLKTDCLVLHNHRYAISPRKLQYNTKLSDFFEIL  
ATSGDRD GKT FVSTARGRKYPVTVNLWQPEKNAFEWATSLKAPHTEDAIRVTQSTANFFI  
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>P80691

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>Q05091

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>P33432

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>Q38716

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>P93349

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>P81131

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>P42820

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>P19172

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>P05117

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>Q9M099

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>P52399

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### (7) S<sub>7</sub>: 21 Golgi apparatus proteins

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>Q9SA77

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>Q9SWH4

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>Q941R4

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>Q946Y7

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**(9) S<sub>9</sub>: 152 nucleus proteins**

&gt;P93045

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&gt;O22446

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&gt;P48513

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&gt;Q8VWG3

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### (10) S<sub>10</sub>: 21 peroxisome proteins

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>O24174

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&gt;Q43097

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### (11) $S_{11}$ : 39 plastid proteins

>P28643

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