**Supplementary Information**

**Supplementary Table 1.** Targeted genes and gRNA sequences of the editing experiment.

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| --- | --- | --- | --- |
| **Target gene** | **gRNA name** | **Protospacer sequence** | **Position** |
| Niben101Scf04551g02001.1 (*NbXT2*) | gXT2 | GCTCTGATTGCACAATGGAA | +1628 |
| Niben101Scf01950g02001.1 (*SPL1950*) | gSPL | ATGGACATAACAGGCGTCGA | +562 |
| Niben101Scf00366g0008.1 (*SPL9294*) | +553 |

**Supplementary Table 2.** List of plasmids used in this work. Sequence information is available at <http://www.gbcloning.upv.es/> by entering the GB Number.

|  |  |
| --- | --- |
| **GB Number** | **Name** |
| GB0107 | pDGB1α2:SF |
| GB0108 | pDGB3α1:P35S:p19:TNOS |
| GB0639 | pDGB2α2:P35S:hCas9:TNOS |
| GB1116 | pDGB3α1\_PNOS:Luciferase:TNOS-SF-P35S:Renilla:TNOS-P35S:p19:TNOS |
| GB1119 | pDGB3α1\_P35S:Luciferase:TNOS-SF-P35S:Renilla:TNOS-P35S:p19:TNOS |
| GB1160 | pDGB1Ω1\_SlDFR:Luc:TNos-SF-35S:Renilla:TNos-35S:P19:Tnos |
| GB1770 | pDGB3α1\_U6-26:gXT2:psgRNA |
| GB2049 | pDGB3α1\_U6-26-4gRNA Pnos-F6x2\_35s-dCas9:EDLL-Tnos-U6-26-5gRNA Pnos scf F6x2 - 35s-Ms2:VPR-Tnos |
| GB2513 | pDGB3α1\_dCas9EDLL-Ms2:VPR SF -gRNA DFR -150 2.1 |
| GB3333 | pUPD2\_SV40-AcrIIA4 (B3-B4-B5) |
| GB3659 | pUPD2\_SV40-AcrIIA4 (B3-B4) |
| GB3660 | pUPD2\_AcrIIA4 (B3-B4) |
| GB3661 | pUPD2\_AcrIIA4 (B3-B4-B5) |
| GB3663 | pUPD2\_mAID (N-tag) B2 |
| GB3664 | pUPD2\_mAID (C-tag) B5 |
| GB3344 | pDGB3α1:P35S:SV40-AcrIIA4:TNOS |
| GB3666 | pDGB3α1\_P35S:mAID:SV40-AcrIIA4:TNOS |
| GB3667 | pDGB3α1\_P35S:SV40-AcrIIA4:mAID:TNOS |
| GB3668 | pDGB3α1\_P35S:mAID:AcrIIA4:TNOS |
| GB3669 | pDGB3α1:p35S:AcrIIA4:mAID:TNOS |
| GB3670 | pDGB3α1\_P35S:K2:SV40-AcrIIA4:TNOS |
| GB3671 | pDGB3α1\_P35S:K2:AcrIIA4:TNOS |
| GB3701 | pDGB3α1:U6-26:gSPL1.6:psgRNA |

**Supplementary Table 3.** List of primers used in this work.

|  |  |
| --- | --- |
| **Gene identifier** | **Primer Sequence (5’🡪 3’)** |
| NbXT2 | TGCACGGTTGTCCGAGTTTG |
| TTACTTGTGAATTGCTCTCTGGT |
| SPL1950 | AAATGTTCAATCCCTGGACGAC |
| CAAAACGGACAGCGACATGGT |
| SPL9294 | GCCCAGGTTTGAATGCATTAGGG |
| GAAAACGGACAACGACATGGT |
| NbDFR | TTCATCTGCGCATCCCATCA |
| TCCCTACTGAGTTTAAAGGTATCGA |
| NbAN2 | GGAAAAGTTGCAGACTGAGGTG |
| ACCCGCAATAAGTGACCATCTG |
| NbF-box | TTGGAAACTCTCTCCCCACTTG |
| GCTCATTGTTGGATGGGTACCT |

**Supplementary Materials and Methods**

The tables provided below show the Agrobacterium cultures co-infiltrated in the same mix for each experiment.

*Directed gene editing assay (Figure 1B)*



*Luciferase reporter activation assay (Figure 1C)*



*Dose-response assay (Figure 2A)*



*Time-course assay (Figure 2B)*



*Temperature Dependent Degron assay (Figure 2D)*



*Auxin Inducible Degron assay (Figure 3B)*



*Auxin Inducible Degron dose-response assay (Figure 3C)*



*Auxin Inducible Degron time-course assay (Figure 3D)*



*Endogenous genes activation assay (Figure 4)*

