

Supplementary Table 1. Mouse genotyping primers

Genotyping Stmn2-KO allele

| Primer | 5' label | SEQUENCE 5' → 3' | 3' label | PRIMER TYPE |
|--------|----------|-------------------------------|------------|-------------------|
| 48340 | | CTC TCA GCC TCC AGG TTT CT | | Common |
| 48341 | | GAG GAA AGG GTG CAT TTG G | | Wild type Reverse |
| 48342 | FAM | TGG ATT GTG TCG TGG AAG TGT A | Quencher-1 | WT Probe |
| 48343 | | TGC TCT TTA CTG GGC TTT CC | | Mutant Reverse |
| 48344 | HEX | CCT CAG TGG TGG AGG GC | Quencher-2 | MUT Probe |

Genotyping BAC Tg-STMN2

| Primer | 5' LABEL | SEQUENCE 5' → 3' | 3' label | PRIMER TYPE |
|--------|----------|-----------------------------|----------|--------------------------------------|
| 31704 | | AGT GGC CTC TTC CAG AAA TG | | Internal Positive Control Forward |
| 31705 | | TGC GAC TGT GTC TGA TTT CC | | Internal Positive Control Reverse |
| 52211 | | CGT GTA CTG ATG CAG GTC TGG | | Transgene Forward |
| 52212 | | CTG AAG CTC CAG AAA TTG AGA | | Transgene Reverse |

Genotyping Sarm1 KO allele

| Primer | 5' label | SEQUENCE 5' → 3' | 3' label | PRIMER TYPE |
|--------|----------|-----------------------------|----------|-------------------|
| 22162 | | TGT GGT TTC CAA ATG TGT CAG | | Mutant Reverse |
| 49955 | | GAA ATG CAT GGA GGG GTT G | | Common |
| 49956 | | CCA CCA AAC GTG TCC AAT C | | Wild type Reverse |

Supplementary Table 2. qPCR Probes

| qPCR probes | Sequence 5' - 3' |
|--------------------------------------|--|
| Mouse STMN2 Fw | TGTCACTGATCTGCTCCTGC |
| Mouse STMN2 Rev | TGGGAGATGGTGGCTTCAAG |
| Mouse TDP43 Exon1 Fw | GCCTAGCGGAGATTTAAGCA |
| Mouse TDP43 Exon 2 Rev | CATGCCCTGGAACTGGG |
| Mouse TDP43 Exon 2 Rev | CGACAACCACTACCTGAGCC |
| Clover fluorescent protein (AAV) Fw | CGACAACCACTACCTGAGCC |
| Clover fluorescent protein (AAV) Rev | GACCATGTGATCGCGCTTCT |
| Mouse GAPDH Fw | GGCAAATTC AACGGCACAGT |
| Mouse GAPDH Rev | GGGTCTCGCTCCTGGAAGAT |
| Mouse Nrnx1 Fw | GTGTCCCAGTGACGATGAGG |
| Mouse Nrnx1 Rev Mouse Agbl1 Fw | CACCTACTCTGGTGGGGTTG TGCTGAACGCGGATGTTCTG |
| Mouse Agbl1 Rev | CAGTGAAGTTCTGTTCTGCGT |
| Mouse SARM1 Fw NM_172795 | CTCTGCAGCCAGAGAAATGCT |
| Mouse SARM1 Rev NM_172795 | GACCCTGAGTTCCTCCGGTA |
| Mouse STMN1 Fw NM_019641 | CGCTTGCGAGAGAAGGACAA |
| Mouse STMN1 Rev NM_019641 | CGGGACAACCTTAGTCAGCCT |
| Mouse STMN3 Fw NM_009133 | GAGGAGCGGAGGAAGACTCA |
| Mouse STMN3 Rev NM_009133 | CGCCAGGCGGCTAAAGTTAT |
| Mouse STMN4 Fw NM_019675 | GACGGCGAGACCCATCATT |
| Mouse STMN4 Rev NM_019675 | TTTCTCCGCGAGGTGTTTCA |

Supplementary Table 3. Antibodies

| Primary Antibodies | | | | | |
|--|--------------|-------------------|-------------|-----------------|-------------------------|
| Name | Cat # | Company | Host | Dilution | Application |
| NeuN | ABN78 | Millipore-Sigma | rabbit | 1:1000 | IHC |
| CHAT (Choline acetyltransferase) | AB144P | Millipore-Sigma | goat | 1:100 | IHC |
| GFAP-Cy3 conjugated (clone G-A-5) | C9205 | Millipore-Sigma | mouse | 1:1000 | IHC |
| Iba1 (clone NCNP24) | 019-19,741 | Wako | rabbit | 1:1000 | IHC |
| α -BTX (α -bungarotoxin, Alexa Fluor 555 conjugated) | B35451 | Invitrogen | ----- | 1:500 | IHC |
| Synaptophysin | NBP2-25170 | Novus Biologicals | chicken | 1:500 | IHC |
| Neurofilament-H | AB5539 | Millipore-Sigma | chicken | 1:500 | IHC |
| Calcitonin gene related peptide (CGRP) | Ab36001 | Abcam | goat | 1:1000 | IHC |
| Lectin IB4 conjugated to Alexa- Fluor 647 (anti-IB4 Alexa Fluor 647) | I32450 | Molecular Probes | ----- | 1:2000 | IHC |
| Human/Mouse Stathmin-2/STMN2 Clone #684433 | MAB6930 | R&D | mouse | 1:200 | IHC (antigen retrieval) |
| Anti-phosphorylated KSP sites in Neurofilament-H and M (SMI-31) | 50-102-9514 | Biologend | mouse | 1:1000 | WB |
| Neurofilament-H Clone RT-97 | NBP2-29435 | Novus Biologicals | mouse | 1:500 | WB |
| NF-M, Clone NN18 | N5264 | Sigma | mouse | 1:1000 | WB |
| NF-L, Clone NR4 | N5139 | Sigma | mouse | 1:1000 | WB |
| Mouse Tubulin β 3, Clone TUJ1; | 801202 | Biologend | mouse | 1:4000 | WB |
| Rabbit Tubulin β 3 Clone TUJ1; | 845502 | Biologend | rabbit | 1:4000 | WB |
| Stathmin-2 | 10586-1-AP | Proteintech | rabbit | 1:1000 | WB |
| Stathmin-2 | NBP1-49461 | Novus Biologicals | rabbit | 1:1000 | WB |
| GAPDH Clone 6C5 | ab8245 | Abcam | mouse | 1:5000 | WB |
| GAPDH Clone 14C10 | 2118 | Cell Signaling | rabbit | 1:5000 | WB |

| Secondary Antibodies | | | | | |
|---|--------------|-------------------------------------|-------------|-----------------|--------------------|
| Name | Cat # | Company | Host | Dilution | Application |
| Cy3 AffiniPure Donkey anti-Guinea Pig IgG [H1L] | 706-165-148 | Jackson ImmunoResearch | Donkey | 1:500 | IHC |
| Alexa 488 Donkey anti-Goat IgG [H1L] | A-11,055 | Invitrogen | Donkey | 1:500 | IHC |
| Alexa 549 Donkey anti-Rabbit IgG [H1L] | A-21,207 | Invitrogen | Donkey | 1:500 | IHC |
| Alexa Fluor 488-conjugated Donkey Anti-Rabbit IgG | 711-545-152 | Jackson ImmunoResearch Laboratories | Donkey | 1:500 | IHC |
| Alexa Fluor 488-conjugated Donkey Anti-Mouse IgG | 715-545-151 | Jackson ImmunoResearch | Donkey | 1:500 | IHC |
| Alexa Fluor 647-conjugated Donkey Anti-Rabbit IgG | 711-605-152 | Jackson ImmunoResearch | Donkey | 1:500 | IHC |
| Alexa Fluor 647-conjugated Donkey Anti-Mouse IgG | 715-605-151 | Jackson ImmunoResearch | Donkey | 1:500 | IHC |
| Anti-Mouse IgG, HRP-Linked Whole Ab | 84-848 | Prometheus | Sheep | 1:5000-1:15000 | WB |
| Donkey Anti-Rabbit IgG, HRP-Linked Whole Ab | 84-854 | Prometheus | Donkey | 1:5000-1:15000 | WB |

Supplementary Table 4. FISH probes

| FISH probes | | | |
|------------------------------|--------------|----------------|--------------------------------------|
| Name | Cat # | Company | Assay |
| RNAscope® Probe- Mm-Stmn2-C2 | 498391-C2 | ACD Biotech | RNAscope Multiplex Fluorescent Assay |