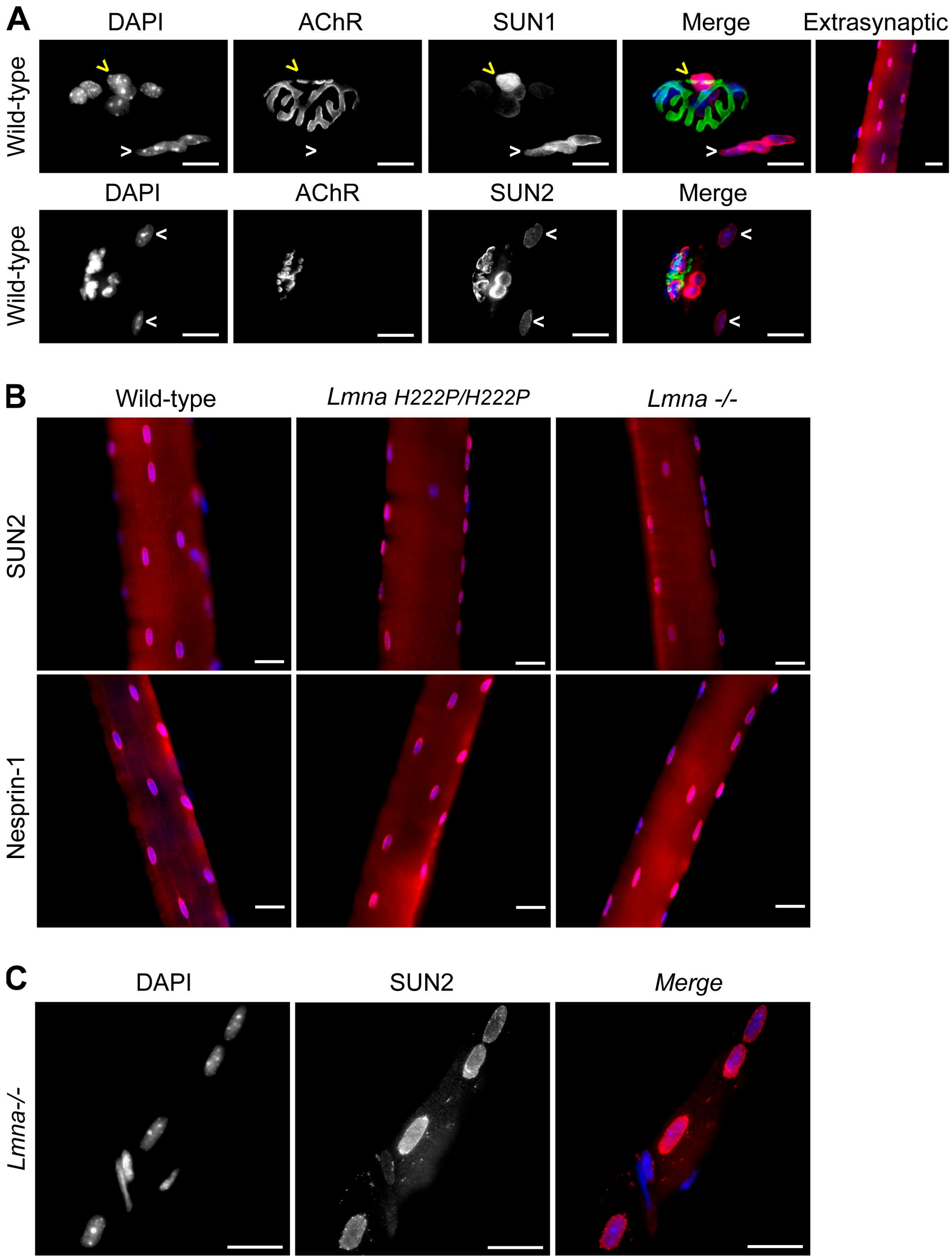

Figure S1. **SUN1, SUN2, and Nesprin-1 localization in muscle fibers.** (A) SUN1 and SUN2 localizations in synaptic and extrasynaptic nuclei of WT mice. Isolated muscle fibers from wild-type (WT) mouse tibialis anterior muscles were stained with DAPI (blue), bungarotoxin (green), and SUN1 or SUN2 antibody (red). SUN1 was highly expressed in terminal Schwann cells (yellow arrowheads) and extrasynaptic muscle nuclei (white arrowheads) but was hardly detectable in muscle synaptic nuclei. Similar stainings were observed in $Lmna^{H222P/H222P}$ and $Lmna^{-/-}$ tibialis anterior (not depicted). Compared with extrasynaptic nuclei, SUN2 was highly enriched in synaptic nuclear envelope. (B) SUN2 and Nesprin-1 localizations in extrasynaptic nuclei. Isolated muscle fibers from wild-type (WT), $Lmna^{H222P/H222P}$, and $Lmna^{-/-}$ tibialis anterior were stained for nuclei with DAPI (blue), for AChR with bungarotoxin (green), and with SUN2 antibody (red) or Nesprin-1 antibody (red). SUN2 and Nesprin-1 were expressed in all muscle nuclei but highly enriched in wild-type synaptic nuclei (Fig. 3). Compared with the wild type, SUN2 was not altered in $Lmna^{H222P/H222P}$ extrasynaptic nuclei and was occasionally punctuated in $Lmna^{-/-}$ extrasynaptic nuclei (C), whereas Nesprin-1 was undistinguishable from the wild type in extrasynaptic nuclei of EDMD mice muscles (B). Bars, 10 µm.

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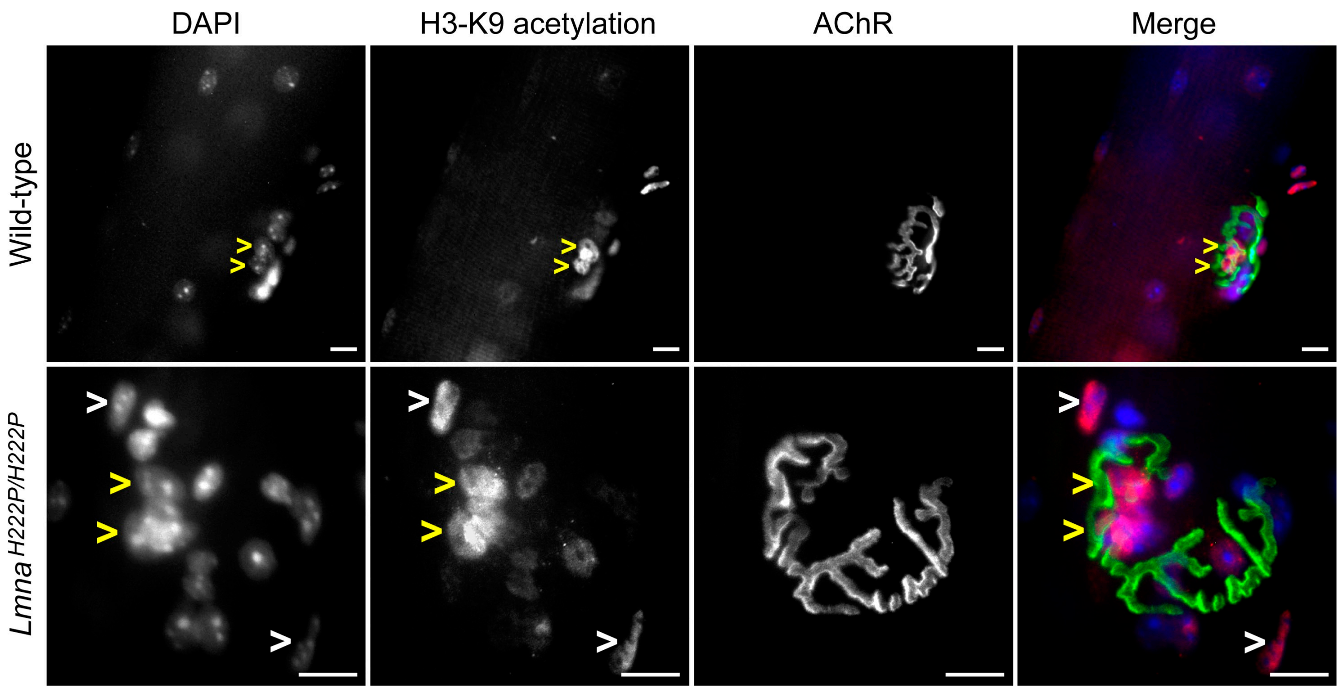

Figure S2. **Synaptic nuclei acetylation in wild-type and mutant *Lmna* mice.** Isolated tibialis anterior muscle fibers from wild-type, *Lmna* $^{-/-}$ (not depicted), and *Lmna* $^{H222P/H222P}$ mice were stained with DAPI, bungarotoxin, and acetylated histone H3-K9 antibody. As previously published, synaptic nuclei were found to be highly acetylated in wild-type fibers compared with extrasynaptic nuclei (Ravel-Chapuis, A., M. Vandromme, J.L. Thomas, and L. Schaeffer. 2007. *EMBO J.* 26:1117–1128). Compared with the wild type, *Lmna*$^{-/-}$ and *Lmna*$^{H222P/H222P}$ synaptic nuclei showed the same levels of acetylation (yellow arrowheads) but an increased level of acetylation in extrasynaptic nuclei (white arrowheads). Bars, 10 µm.

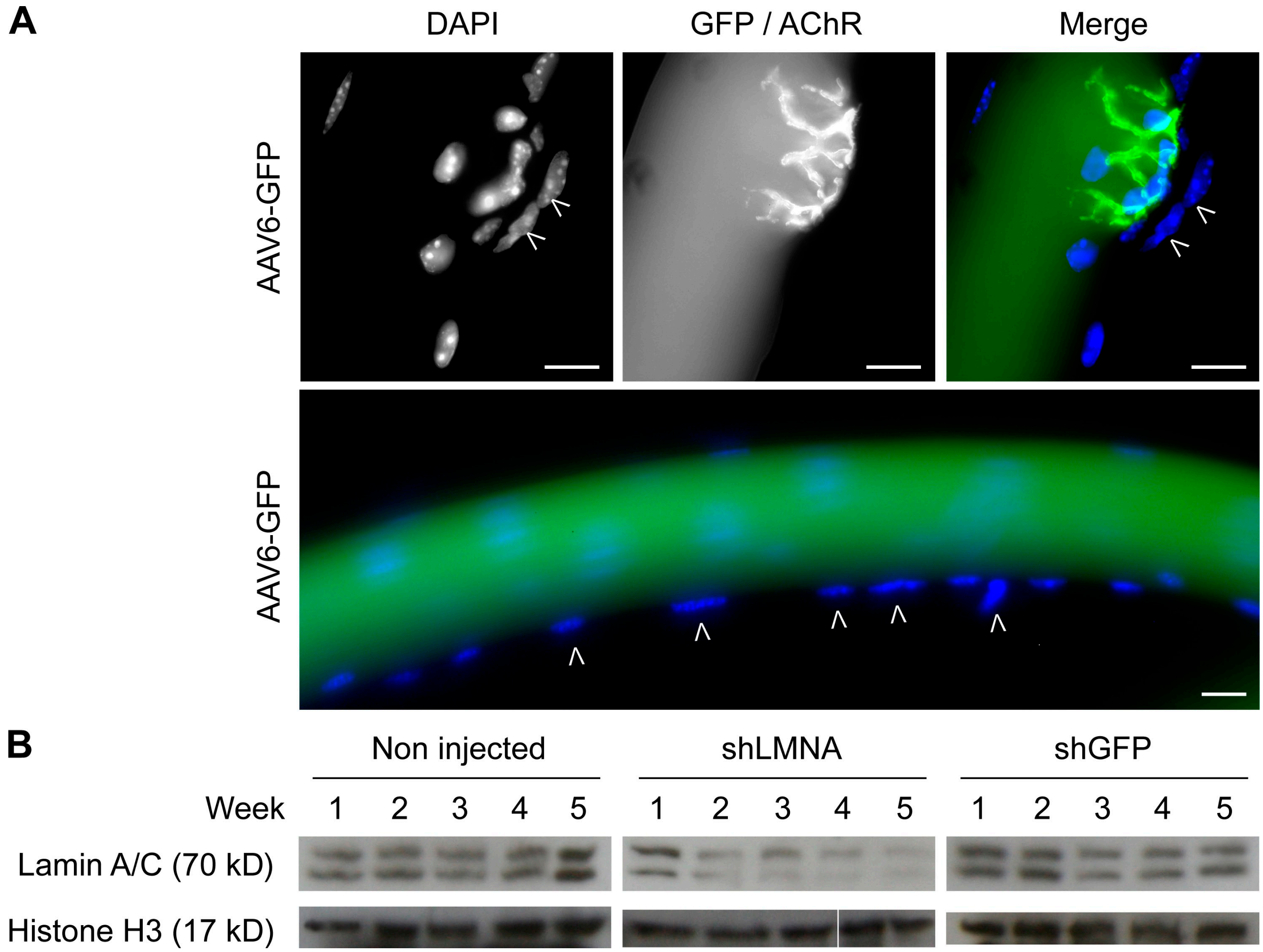

Figure S3. **Transient knockdown of *LMNA* using AAV.** (A) GFP expression in AAV-6–injected tibialis anterior muscles. Muscle fibers from AAV6-GFP injected tibialis anterior muscles were isolated 1 wk after injection and stained for nuclei with DAPI (blue) and for AChR with bungarotoxin (green). About 80% of the muscle fibers were GFP-positive, whereas no GFP could be detected in interstitial cells (arrowheads in bottom panel), Schwann cells (arrowheads in top panels), or the nerve terminal. Both the synaptic (top) and extrasynaptic (bottom) muscle areas are provided. Bars, 20 µm. (B) *Lmna* knockdown by AAV-6–shRNA viruses. Lamin A/C proteins levels were evaluated by Western blotting between 1 and 5 wk after AAV injection in tibialis anterior of 6-wk-old male C57BL/6 mice. Samples from mice injected with AAV expressing shRNA against *Lmna* (shLMNA) or *GFP* (shGFP) are shown. Noninjected contralateral muscles (noninjected) were used as a control, and expression levels of histone H3 were used as a loading control.

Table S1. **Description of patients and normal volunteers**

Patient	Pathology	Gender	Age	Muscle	Mutation	Reference
			y			
ALS 1	ALS	Male	46	Unspecified	Not determined	E. Hoffman, unpublished data
ALS 2	ALS	Male	31	Unspecified	Not determined	E. Hoffman, unpublished data
CMS 1	CMS	Female	25	Deltoid	*CHRNE* c.775G>C, p.V259L, dominant	D. Hantaï, unpublished data
CMS 2	CMS	Male	12.5	Deltoid	*MUSK* c.2503A>G, p.M835V, homozygous	D. Hantaï, unpublished data
EDMD 1	EDMD	Male	13	Gluteus	*LMNA* c.94_96delAAG, p.delK32, heterozygous	Muchir et al., 2004
EDMD 2	EDMD	Male	59	Biceps	*LMNA* c.665A>C, p.H222P, heterozygous	Bonne et al., 2000
EDMD 3	EDMD	Female	23	Deltoid	*LMNA* c.746G>A, p.R249Q, heterozygous	G. Bonne, unpublished data
EDMD 4	EDMD	Female	2	Unspecified	*LMNA* c.1381-1G>T, c.IVS7-1 G>T, heterozygous	Bakay et al., 2006
EDMD 5	EDMD	Male	8	Unspecified	LMNA c.1801A>G, p.S601G, heterozygous	Bakay et al., 2006
FPLD 1	FPLD-DCM-CD	Female	43	Deltoid	*LMNA* c.178C>G, p.R60G, heterozygous	van der Kooi et al., 2002
LGMD1B 1	LGMD 1B	Female	63	Quadriceps	*LMNA* c.1129C>T, p.R377C, heterozygous	G. Bonne, unpublished data
LGMD1B 2	LGMD 1B	Female	68	Deltoid	*LMNA* c.1262delTG, p.L421RfsX4, heterozygous	G. Bonne, unpublished data
NV 1	NV	Male	5	Unspecified	Not applicable	E. Hoffman, unpublished data
NV 2	NV	Male	11	Deltoid	Not applicable	G. Bonne, unpublished data
NV 3	NV	Male	20	Deltoid	Not applicable	G. Bonne, unpublished data
NV 4	NV	Male	29	Unspecified	Not applicable	E. Hoffman, unpublished data
NV 5	NV	Male	37	Unspecified	Not applicable	E. Hoffman, unpublished data
NV 6	NV	Male	43	Duadriceps	Not applicable	G. Bonne, unpublished data
NV 7	NV	Male	58	Deltoid	Not applicable	G. Bonne, unpublished data
BMD 1	BMD	Male	20	Unspecified	*DMD* c.6439-?_6912+?del (ex45ex47del)	Kesari et al., 2008
BMD 2	BMD	Male	9	Unspecified	*DMD* c. 94-?_3786+?del (ex03ex27del)	Kesari et al., 2008
BMD 3	BMD	Male	2	Unspecified	*DMD* c. 6439-?_7872+?del (ex45ex53del)	Kesari et al., 2008

For each patient and when available, the following information is provided: pathology, gender of the patient, age at biopsy, muscle biopsied, mutated gene, and its mutation. NV, normal volunteer.

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Table S2. **Sequences of the primers used in quantitative PCR experiments**

Gene	Forward	Reverse
Myog	5′-CTACAGGCCTTGCTCAGCTC-3′	5′-AGATTGTGGGCGTCTGTAGG-3′
Myod1	5′-AGCACTACAGTGGCGACTCA-3′	5′-GCTCCACTATGCTGGACAGG-3′
Chrna	5′-ACCTGGACCTATGACGGCTCT-3′	5′-AGTTACTCAGGTCGGGCTGGT-3′
Chrng	5′-GTGTCTTCGAGGTGGCTCTC-3′	5′-TCTGGGATTGGAAGATGAGG-3′
Chrne	5′-CTTGGTGCTGCTCGCTTACTT-3′	5′-CGTTGATAGAGACCGTGCATT-3′
Hdac9	5′-GCGGTCCAGGTTAAAACAGA-3′	5′-GAGCTGAAGCCTCATTTTCG-3′
Fbxo32	5′-CAGTGAGGACCGGCTACTGT-3′	5′-CCAGGAGAGAATGTGGCAGT-3′
Gapdh	5′-AACTTTGGCATTGTGGAAGG-3′	5′-ACACATTGGGGGTAGGAACA-3′
MYOG	5′-CAGTGCCATCCAGTACATCG-3′	5′-AGGTTGTGGGCATCTGTAGG-3′
MYOD1	5′-GTCGAGCCTAGACTGCCTGT-3′	5′-GGTATATCGGGTTGGGGTTC-3′
CHRNA	5′-TGACTATGGCGGTGTGAAAA-3′	5′-TCAAAGGGAAAGTGGGTGAC-3′
CHRNG	5′-GCGCTGGAGAAGCTAGAGAA-3′	5′-CACCAGGAACCACTCCTCAT-3′
FBXO32	5′-GGCTGCTGTGGAAGAAACTC-3′	5′-CCTTCCAGGAAAGGATGTGA-3′
GAPDH	5′-TTCGACAGTCAGCCGCATCTTCTT-3′	5′-CAGGCGCCCAATACGACCAAATC-3′