Table e-1. Clinical details of LEMS cases. CMAP: compound muscle action potential; P/Q ab titer, N-ab titer: Antibody titers for IgG against P/Q-type and N-type calcium channels, respectively; Neg: negative.

Sample number	**Age at disease onset**	**Gender**	**Tumor status**	**Electrophysiology**		**P/Q- ab titer (pM)**	**N- ab titer (pM)**
				CMAP amplitude (mV)	% Increment		
LEMS 1	48	M	Nil	6.1 mV	146	261	Neg
LEMS 2	68	M	Anaplastic large cell lung carcinoma	2.2 mV	145	575	60
LEMS 3	44	F	Small cell lung carcinoma	1.2 mV	1,233	10,755	127
LEMS 4	58	M	Nil	4.2 mV	281	362	Neg

Table e-2. Comparison of TRP size, k_{SP}, k_{EV}, and k_{AP} in cultures treated with pooled control or LEMS IgG. The effects of each of the four LEMS samples are also shown.

	Control	LEMS	LEMS 1	LEMS 2	LEMS 3	LEMS 4
Number of experiments	21	25	3	5	8	9
Number of boutons	927	791	47	222	205	317
TRP (mean)	**2.46**	**2.16**	**1.80**	**2.67**	**1.49**	**2.56**
Standard deviation	1.63	1.26	0.34	1.68	1.34	0.94
SEM	0.36	0.25	0.20	0.75	0.47	0.31
k_{SP} x 10^3, sec^{-1} (mean)	**0.32**	**0.24**	**0.14**	**0.24**	**0.26**	**0.27**
Standard deviation	0.07	0.12	0.14	0.11	0.02	0.10
SEM	0.02	0.02	0.08	0.05	0.01	0.03
k_{EV} x 10^3, sec^{-1} (mean)	**0.96**	**0.73**	**0.50**	**0.75**	**0.77**	**0.75**
Standard deviation	0.22	0.16	0.18	0.13	0.21	0.10
SEM	0.05	0.03	0.10	0.06	0.07	0.03
k_{AP} x 10^3, sec^{-1} (mean)	**0.65**	**0.49**	**0.37**	**0.51**	**0.51**	**0.48**
Standard deviation	0.21	0.20	0.30	0.20	0.23	0.17
SEM	0.05	0.04	0.17	0.09	0.08	0.06

Supplemental data

Figure e-1

LEMS IgG reduces evoked and spontaneous synaptic vesicle release.

Effects of LEMS and control IgG on k_{EV} (A) and k_{SP} (B). Left panels show cumulative distributions of mean k_{EV} and k_{SP} size values obtained in individual experiments (average of 10 – 50 boutons in each experiment). Data obtained with samples obtained from each of four LEMS patients are shown as thin coloured lines. LEMS samples 1 – 4 are color-coded as in the legend, and were used in 3, 9, 8, and 6 experiments respectively. Solid red line, pooled LEMS IgG data; solid black line, control IgG Right panels show the mean (± SEM) values for the pooled data (LEMS IgG n = 26 experiments, control IgG n = 21 experiments; *, $p < 0.05$; **, $p < 0.01$).

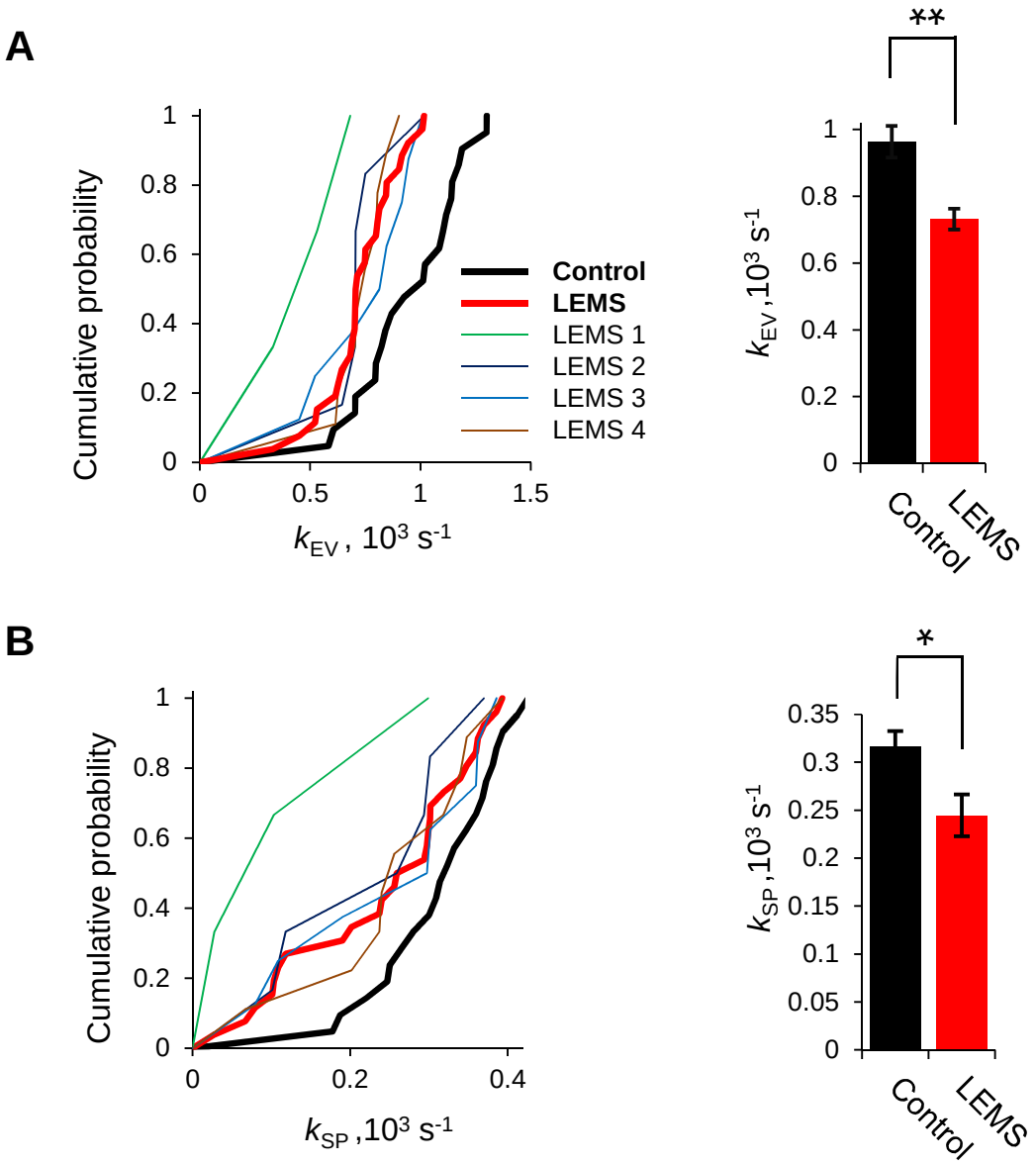
Figure e-2: **Synaptic transmission in *Cacna1a*$^{-/-}$ neurons depends on N- and R-type VGCCs.** (**A**) Typical experiments showing evoked excitatory postsynaptic current (EPSC) amplitude plotted against time in WT (left) and *Cacna1a* knockout (KO, right) neurons before (black) and after sequential application of the P/Q-type blocker ω-AgaTx IVA (250 nM; red), the N-type blocker ω-CTx GVIA (5 μM; blue), and the R-type blocker SNX-482 (200 nM; gray). Insets: representative EPSCs before (black) and after addition of each blocker (colors as for scatter plot). Scalebar: 50 pA, 20 ms. (**B**): normalized EPSC amplitudes in WT (left) and *Cacna1a* knockout (right) neurons after sequential application of the VGCC blockers (WT, n = 10; KO, n = 6; *, $p < 0.05$).

Methods for figure e-2

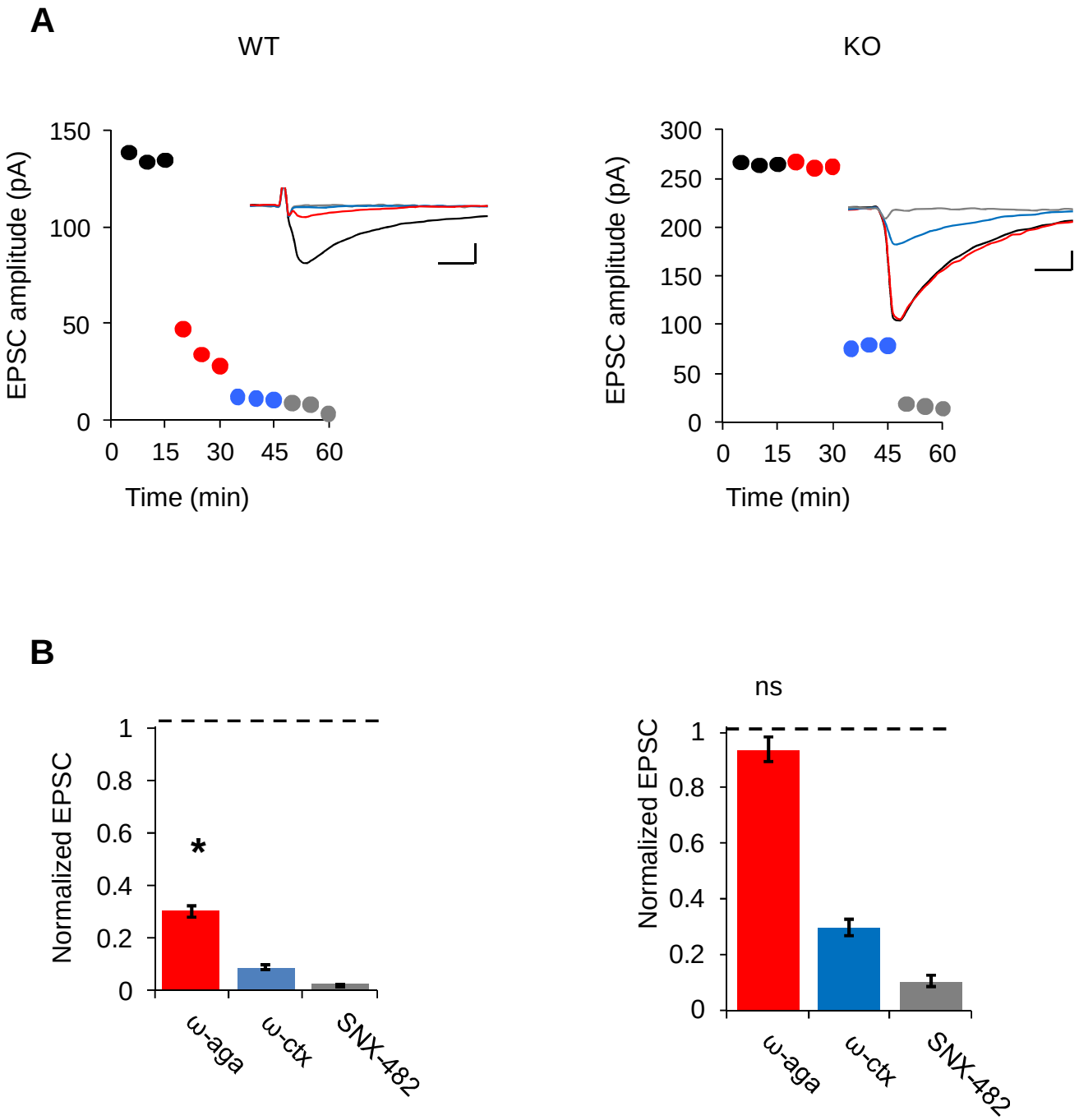
Somatic whole-cell voltage clamp recordings from *Cacna1a*$^{-/-}$ and WT neurons were achieved with a Multiclamp 700B amplifier (Molecular Devices), with a pipette solution containing (in mM) 120 $CsCl_2$, 10 HEPES, 2 EGTA, 8NaCl, 0.2 $MgCl_2$, 2 MgATP, 0.3 NaGTP, 5 Qx414.5, 10 phosphocreatine. A bipolar stimulating electrode was placed near a dendrite of the recorded neuron to evoke excitatory postsynaptic currents (EPSCs). Stimuli were delivered via a DS2A isolated constant voltage stimulator (Digitimer, UK) every 5 seconds. EPSC amplitudes were measured at baseline and after the sequential application of specific toxins to block P/Q- (250 nM ω-Agatoxin IVA), N- (5 μM ω-conotoxin GVIA) and R-type (200 nM SNX-482) VGCCs.

Figure e-3: Fluorescence measurements in *Cacna1a*$^{-/-}$ and wild type cultures following incubation in control or LEMS IgG.

(**A, B, C, D**) Representative SRC1 imaging experiments in WT cultures treated with control (A) or with LEMS IgG (B) and KO cultures treated with control (C) or with LEMS IgG (D). Fluorescence microscopy images (top) show loss of fluorescence at different time points during the experiment. Fluorescence time-courses in two pairs of representative boutons (arrows) are shown below. Spontaneous and evoked destaining rates were fitted with monoexponential curves. Scale bars: 10 μm.

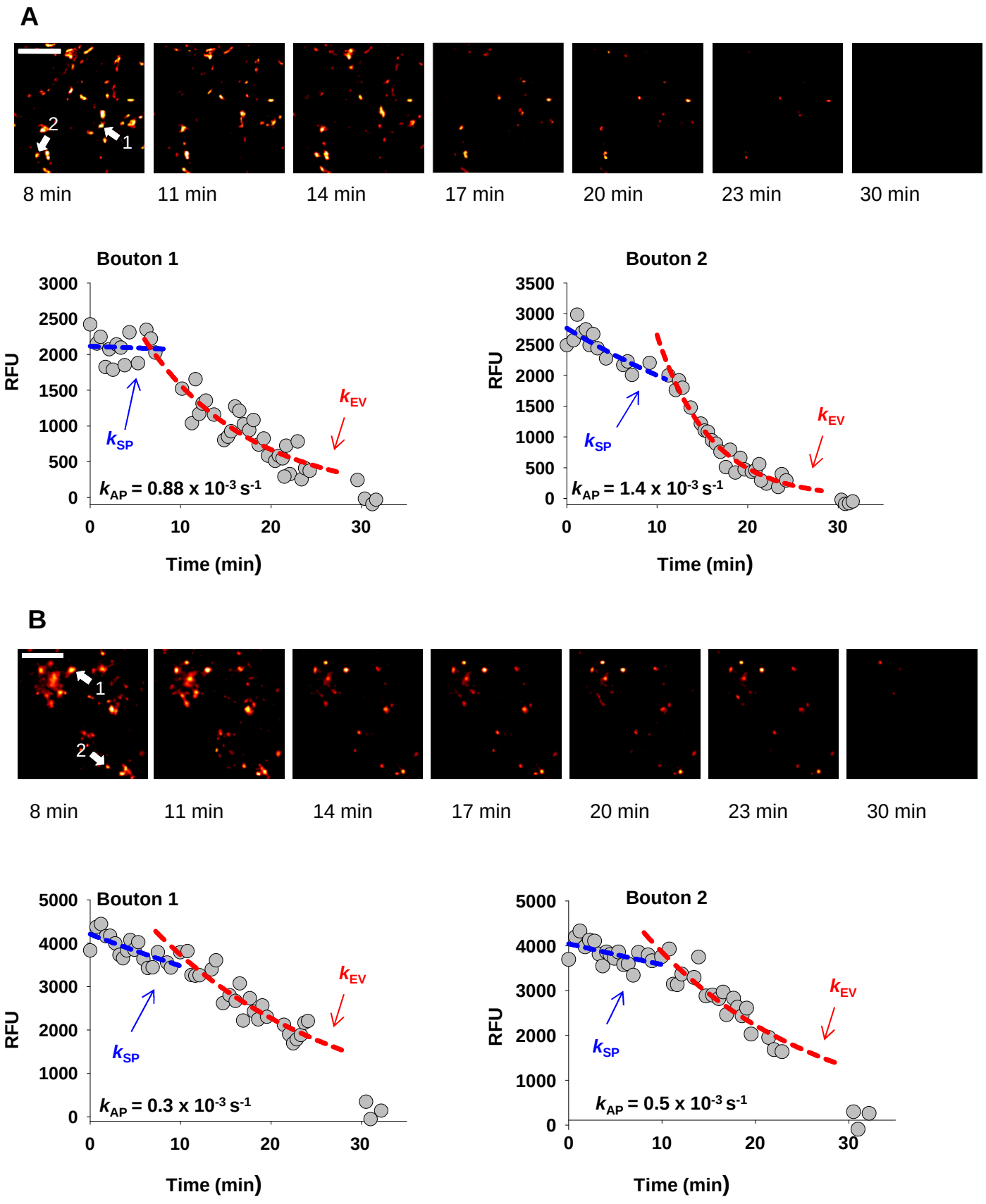


Supplementary Fig. 1



Supplementary Fig. 2

Supplementary Fig. 3



Supplementary Fig. 3 (continued)