Neuron, Volume *68*

Supplemental Information

Bidirectional Plasticity Gated by Hyperpolarization Controls the Gain of Postsynaptic Firing Responses at Central Vestibular Nerve Synapses

Lauren E. McElvain, Martha W. Bagnall, Alexandra Sakatos, and Sascha du Lac

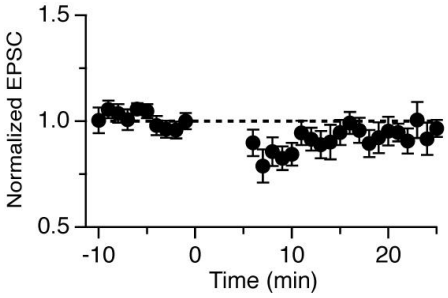

Figure S1: Enhancement of NMDA-Rs interferes with the induction of LTP in YFP-16 neurons. Application of the 100 Hz stim plus hyperpolarization protocol to YFP-16 neurons bathed in low-magnesium (0.3 mM) Ringer's solution failed to induce LTP. Data are as shown ± SEM.

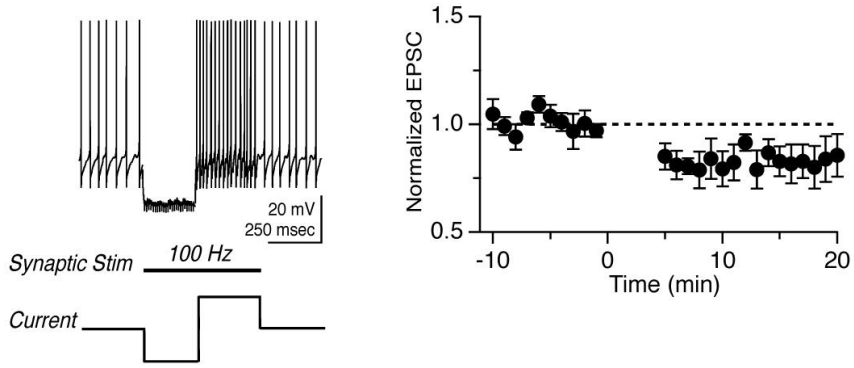

Figure S2: Elevation of postsynaptic firing rate following hyperpolarization is not sufficient to induce LTP in non-rebounding neurons. In YFP-16 neurons lacking intrinsic post-hyperpolarization rebound firing, a modified 100 Hz stim plus hyperpolarization

protocol was applied in which a 300-msec depolarizing current step was injected immediately following the hyperpolarizing step to mimic rebound (left). This protocol elevated the post-hyperpolarization firing rate by 35.2 ± 6.1 Hz but failed to induce LTP (right). Data are as shown ± SEM.

	100 Hz Stim Protocol			**100 Hz Stim plus Hyperpolarization Protocol**		
	Pre	**Post**	***P* value**	**Pre**	**Post**	***P* value**
AP width (ms)	0.67 ± 0.05	0.67 ± 0.04	0.83	0.61 ± 0.03	0.61 ± 0.03	0.99
Threshold (mV)	-51.9 ± 1.3	-53.1 ± 1.2	0.08	-50.6 ± 1.0	-52.0 ± 1.2	0.09
Input res. (MΩ)	71.1 ± 15.6	71.5 ± 15.8	0.93	71.9 ± 12.5	74.2 ± 13.8	0.15
Gain (Hz/nA)	219 ± 32	212 ± 30	0.31	238 ± 24	238 ± 26	0.71

Table S1: Intrinsic characteristics of YFP-16 MVN neurons before and after synaptic plasticity induction protocols. Values indicate mean ± SEM.