**Supplemental Fig. S1. Electrophysiological effects of equimolar mixture of N- and C-lobes on CaV1.2**

After a 1 min recording of NPo in the cell-attached mode, the inside-out patch mode (I.O) was established. [N-lobe + C-lobe] of 1 μM, 6 μM, 10 μM and 20 μM were applied together with 3 mM ATP at [Ca2+] of 80 nM *(light gray)* and 2 μM *(Dark gray)*. The mixture of N-lobe and C-lobe at 80 nM [Ca2+] induced channel activity in inside-out patches that was 11 ± 1% (n = 3, total lobe concentration 1 μM), 65 ± 6% (n = 4, 6 μM), 122 ± 10% (n = 3, 10 μM), and 45 ± 11% (n = 4, 20 μM) that of the control activity in the cell-attached mode. The mixture of N-lobe and C-lobe at 2 μM [Ca2+] induced channel activity in inside-out patches that was 14 ± 2% (n = 3, 1 μM), 35 ± 6% (n = 3, 6 μM), 34 ± 3% (n = 3, 10 μM), and 18 ± 4% (n = 3, 20 μM) that of the control activity in the cell-attached mode. The mean relative channel activity level induced by N-lobe plus C-lobe were plotted against ([N-lobe] + [C-lobe])/2 (referring to one equal [CaM]) and presented as the mean ± S.E.; n = 3–4).

**Supplemental Fig. S2. Time course of averaged NPo of different lobe and their combinations at inside-out patches**

A, B: The mean relative channel activity level induced by 9 μM, 30 μM, and 90 μM N-lobe at [Ca2+] of 80 nM *(A)* and 2 μM *(B)* after inside-out patch 1, 3, 5 and 7 min were plotted against the time and presented as the mean ± S.E. (n = 3–6). C, D: The mean relative channel activity level induced by 3 μM, 10 μM, and 30 μM C-lobe at [Ca2+] of 80 nM *(C)* and 2 μM *(D)* after inside-out patch 1, 3, 5 and 7 min were plotted against the time and presented as the mean ± S.E. (n = 3–6). E, F: The mean relative channel activity level induced by 4.5 + 1.5 μM, 15 + 5 μM, and 30 + 10 μM N-lobe plus C-lobe at [Ca2+] of 80 nM *(E)*, and 1.5 + 0.5 μM, 4.5 + 1.5 μM, and 30 + 10 μM N-lobe plus C-lobe at [Ca2+] of 2 μM *(F)* after inside-out patch 1, 3, 5 and 7 min were plotted against the time and presented as the mean ± S.E. (n = 3–10). G, H: Data of 90 μM N-lobe in *A*, 30 μM C-lobe in *C*, and 30 + 10 μM N-lobe plus C-lobe in *E* were normalized with the NPo of 90 μM N-lobe and summarized in *G*. Data of 90 μM N-lobe in *B*, 30 μM C-lobe in *D*, and 30 + 10 μM N-lobe plus C-lobe in *F* were normalized with the NPo of 90 μM N-lobe and summarized in *H*.