Profiling the MAPK/ERK dependent and independent activity regulated transcriptional programs in the murine hippocampus in vivo

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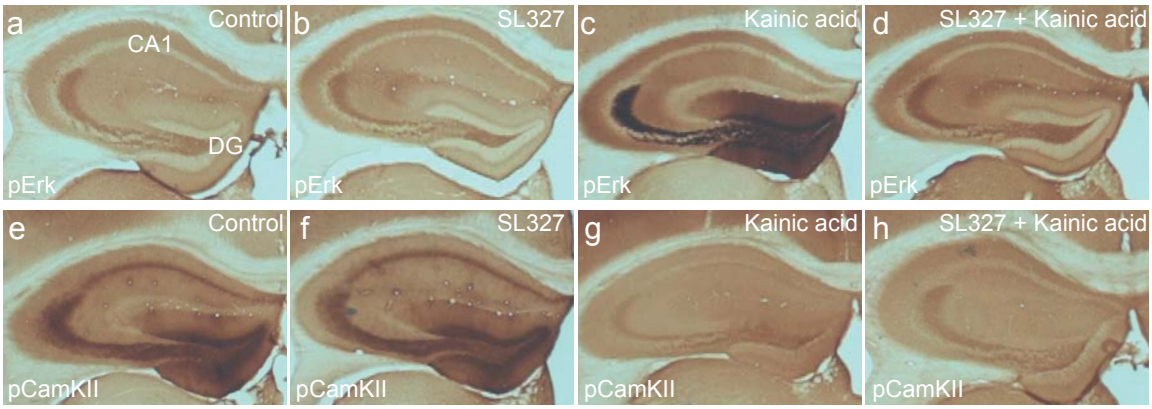

Supplemental Figure 1. The MEK inhibitor SL327 blocks seizure induced ERK phosphorylation but has no effect on autophosphorylation of CaMKII.
The inhibitory domain of the Calcium/calmodulin-dependent protein kinase II (CaMKII) is within the same polypeptide. Autophosphorylation of Thr286 occurs as an inter-subunit reaction and modulates CaMKII kinase activity[1]. Previous studies demonstrated that seizures cause a dramatic loss of CamKII Thr286 phosphorylation[2]. Parallel coronal mouse brain sections were immunostained for p-ERK (a-d) or for p-CaMKII (Thr286) (e-h). Mice were treated with vehicle (a, e); with SL327 for 90 minutes (b, f); treated with kainic acid and sacrificed 15 minutes after onset of seizures (c, g); or treated with SL327 60 minutes before intraperitoneal kainic acid injections and sacrificed 15 minutes after onset of seizures. The monoclonal p-CaMKII antibody recognizes endogenous CaMKII-α only when phosphorylated at Thr286 and CamKII-β, and CamKII-γ only when phosphorylated at Thr287. Note that SL327 treatment does not alter the level of CaMKII autophosphorylation at Thr287. CA1, field CA1 of the hippocampus; DG, dentate gyrus.

Supplemental references

1 Lisman, J., Schulman, H. & Cline, H. The molecular basis of CaMKII function in synaptic and behavioural memory. Nat Rev Neuroscience 3, 175-190, doi:10.1038/nrn753 (2002)

2 Dong, Y. & Rosenberg, H.C. Brief seizure activity alters Ca2+/calmodulin dependent protein kinase II dephosphorylation and subcellular distribution in rat brain for several hours. Neurosci Lett 357, 95-98, doi:10.1016/j.neulet.2003.11.069 (2004)