**CaMKIIα (Millipore) immunostaining with Fluoro Nissl counter**

**(Floating) XG**

Animals

1. If needed, 150 ug colchicine should be injected into lateral ventricle or targeted tissue two days before perfusion to enhance CaMKIIa signals in the soma.

Perfusion, Agarose-embedding, Sectioning

2. Transcardially perfuse with saline followed by 4% paraformaldehyde and 0.2% picric acid with 0.1 M phosphate buffer (pH 7.2–7.3). Postfix overnight with the same fixative.

3. Remove the dura. If possible, the arachnoid membrane, the pia also.

4. Embed the brain into the 4% electrophoresis quality agarose.

5. Section the brain with vibrating blade microtome into 50-µm-thick slices and harvest them in 12 well plates containing PBS

Antibody application (Room temperature, Light shielding)

6. 10%NGS in PBS-X, 30 min on shaker

7. 1st antibody in PBS-XG, 2 overnight on shaker

8. PBS-X wash (quick × 1, 10 min × 2)

9. 2nd antibody in PBS-XG, 2 hr.

10. PBS-X wash (quick × 1, 10 min × 2)

11. PBS wash

Counterstaining with fluorescent Nissl

12. Diluted NeuroTrace (Blue), 40-60 min.

13. PBS wash (quick × 1, 10 min × 2)

Mounting

14. Mount on gelatin-coated glass slides and Air-dry (30 min)

Coverslipping

15. Coverslip with 50% (v/v) glycerol/2.5% (w/v) DABCO in PBS.

Observation

16. Observe with epifluorescence or confocal microscopy.

**Solutions**

**PBS-X** (total 550 ml)

20% Triton X-100 8.25 ml final 0.3%　-> 0.5％

in PBS 541.75 ml

**PBS-XG** (150 ml)

normal goat serum 1.5 ml (final 1%)

sodium azide 30 mg (final 0.02%)

in PBS-X 148.5 ml

**10%NGS in PBS-X** (5 ml)

normal goat serum 0.45 ml (final 10%)

in PBS-XG 4.55ml

**1st antibody**

Ms anti-CaMKIIα (Millipore Cat# 05-532, RRID:AB\_309787), 1:200 dil., 1 µg/ml final

in PBS-XG

**2nd antibody**

Go anti-Ms IgG Alexa Fluor 488 (A-11029): 1:1k dil., 2 µg/ml final

in PBS-XG

**Diluted NeuroTrace Solution** ( NeuroTrace Blue, N-21479)

Confocal microscopy (1:150 dilution with PBS)

Epifluorescence microscopy (1:300 dilution with PBS)

**Reagents**

05-532 (Millipore): 100 µg, \64,000

A-11029 (Invitrogen): 0.5 ml, 71,300 HUF

N-21479 (Invitrogen): 1 ml, \34,000

Normal Goat Serum IHR-8136 (ImmunoBioScience): 20 ml, \9,000

**References**

Rajani Maiya,Viktor Kharazia,Amy W Lasek,Ulrike Heberlein. (2012) Lmo4 in the basolateral complex of the amygdala modulates fear learning. PloS one 7. PMID: 22509321

Ting AK, Chen Y, Wen L, Yin DM, Shen C, Tao Y, Liu X, Xiong WC, Mei L. (2011) Neuregulin 1 promotes excitatory synapse development and function in GABAergic interneurons. J Neurosci 31 15-25. PMID: 21209185

Erondu, N E and Kennedy, M B. (1985) Regional distribution of type II Ca2+/calmodulin-dependent protein kinase in rat brain. J. Neurosci., 5: 3270-7. PMID: 4078628