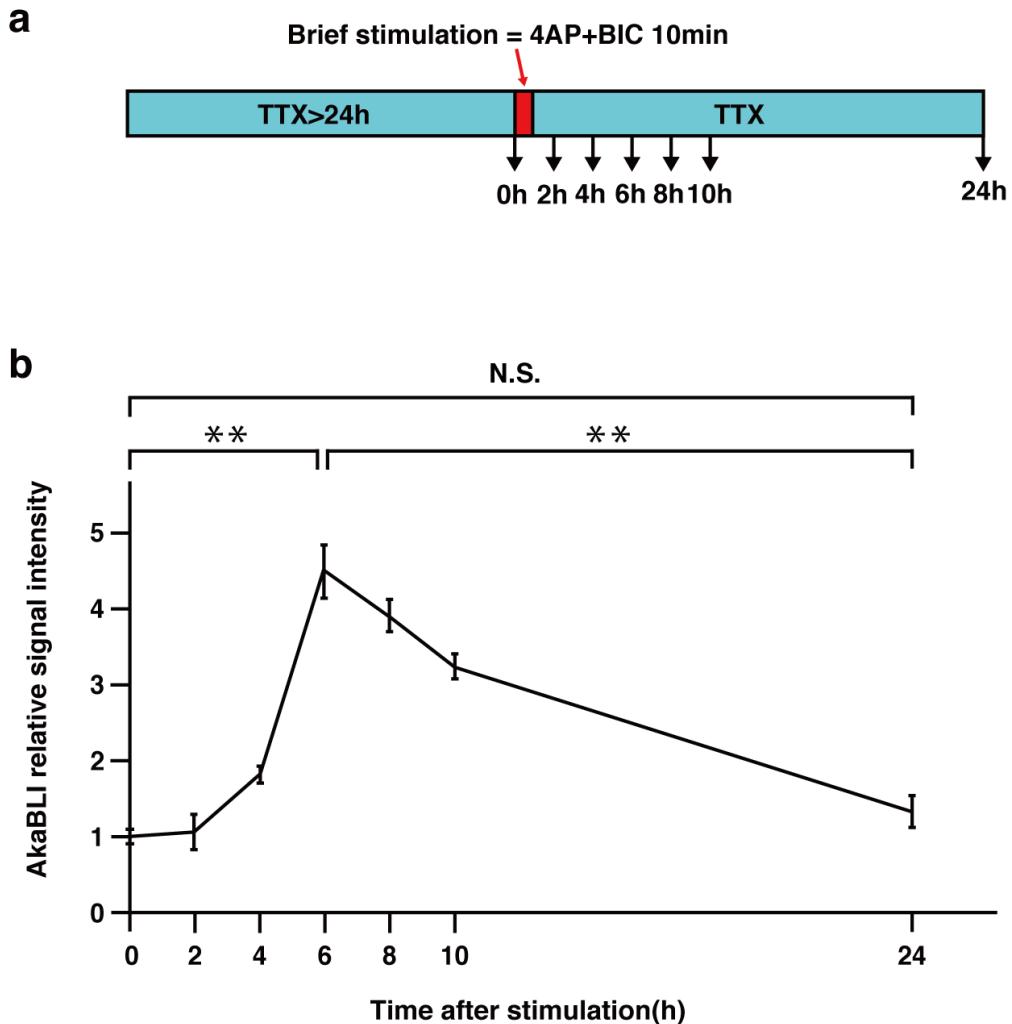


1    **Supplementary Fig. 1**



2

3    **Supplementary Fig. 1**

4    **BLI of hippocampal neurons stimulated with 4AP+BIC *in vitro***

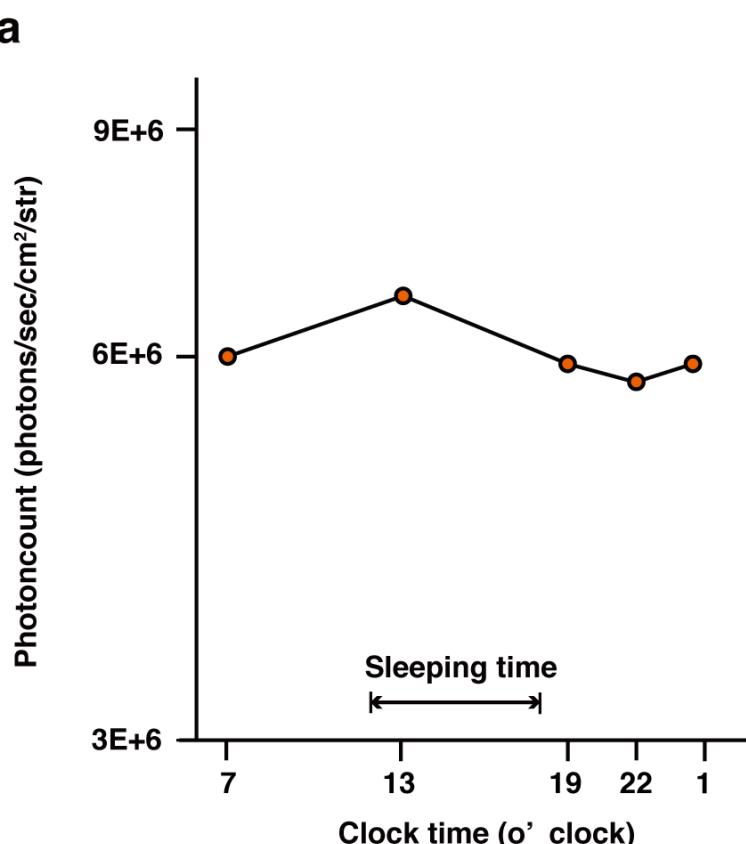
5    **(a)** Scheme of the experiment used to detect the time course of ESAL expression using mouse

6    hippocampal neurons. Before and after brief stimulation, the neurons were silenced with 1uM

7    TTX.

8 (b) The result of multiple time-point BLI measurements in ESAL-expressing mouse  
9 hippocampal neurons. N = 5 independent experiments for 0, 6, 24 hours, and n = 3 for 2, 4, 8,  
10 10 hours. Values are the mean  $\pm$  SEM; \*p < 0.05, \*\*p < 0.01. Statistical analyses were  
11 performed using the two-sided unpaired Student's *t* test. Individual t-values and degrees of  
12 freedom: 0 and 6 hours; *t* (8) = 10.42, p =  $6.2 \times 10^{-6}$ , 6 and 24 hours; *t* (8) = 8.357, p =  $3.2 \times 10^{-5}$ ,  
13 0 and 24 hours; *t* (8) = 1.568, p = 0.16.

14

15 **Supplementary Fig. 2**

16

17 **Supplementary Fig. 2**

18 ***In vivo* monitoring of ESAL bioluminescence over the day**

19 **(a)** Representative diurnal transition of luminescence intensity in the cervical spine of an

20 ESAL-expressing NS/PC-transplanted mouse (photons/sec/cm<sup>2</sup>/str). All the measurements

21 were performed within a week (10–11 weeks after transplantation). Sleeping time in the figure

22 shows a typical example because mice are nocturnal.

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