funakoshi
FRONTIERS IN LIFE SCIENCE

Research Use Only

LiveReceptor AMPAR

< Endogenous AMPAR Labeling Reagent >

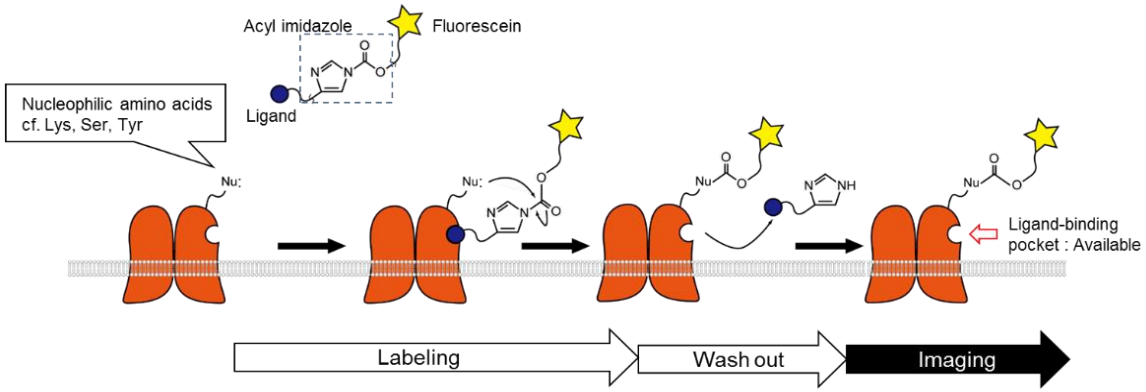
For more information : http://www.funakoshi.co.jp/exports_contents/81075

Live Receptor AMPAR is a new, specific labeling regent for synaptic AMPA type glutamate receptor

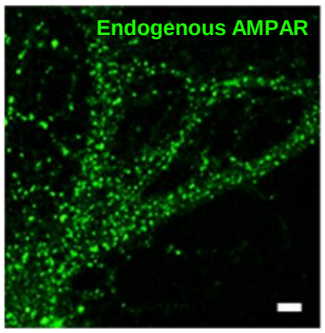
This product is commercialized by the research result of Professor Hamachi, at Department of Synthetic Chemistry and Biological Chemistry, Graduate School of Engineering, Kyoto University.

Background of LiveReceptor AMPAR

Receptors on cell surfaces respond to extracellular stimulations and move dynamically. Genetically engineered, fluorescence protein fused receptor proteins are mainly used as a method to analyze such receptors' function. However, it may not reflect physiological action. Therefore, the imaging technique for visualization of endogenous receptors has been awaited. Dr. Hamachi and Dr. Kiyonaka recently developed a new technology to label endogenous target receptors specifically by using acyl imidazole, a reactive unit to protein surface.
LiveReceptor AMPAR is the world-first reagent which can specifically label AMPA-type glutamate receptors (AMPARs) with fluorescein dye on living neurons by using above technology. This reagent is based on a unique chemical reaction and can accomplish labeling of AMPARs keeping its ligand-binding pockets and receptor functions.
LiveReceptor AMPAR is a powerful tool to investigate physiological functions of AMPAR by monitoring receptor trafficking of endogenous AMPARs on live cells. No complicated protocol and genetic manipulation are required.



LiveReceptor AMPAR

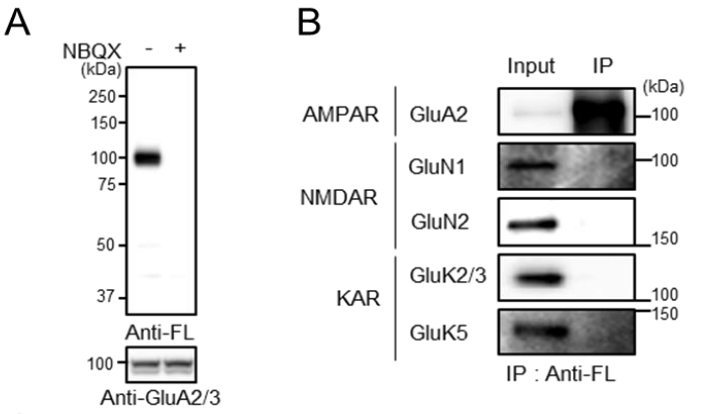


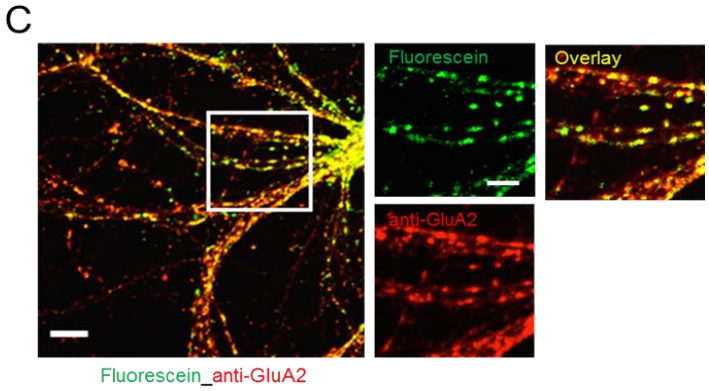
Original Paper : Wakayama, *et al*., *Nat. Commun.,* **8**, 14850 (2017).
（LiveReceptor AMPAR is called as CAM2（FI）in this paper.）

Features

- Can label endogenous AMPAR with fluorescein
- Highly specific to AMPAR (GluA2-4 subunits). No label on other ion channel type glutamate receptors
- Can observe signal for 1 to 4 hours after adding LiveReceptor to medium
- No cell permeability - only AMPAR on cell surface can be labeled.
- Ion channel function is maintained after labeling
- Low cytotoxicity under recommended concentration (1 μM)
- Excitation/ Emission: 495/515 nm ; Compatible with FITC filter

Application Data



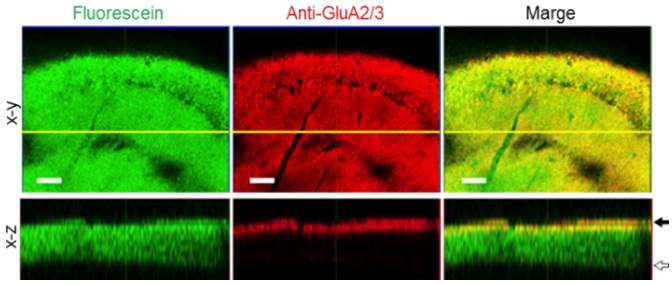


Specificity of LiveReceptor AMPAR

A. Hippocampal slices were treated with 1 μM of LiveReceptor AMPAR in the absence or presence of 10 μM NBQX (a potent inhibitor of AMPAR). The cell lysates were analyzed by western blotting using anti-fluorescein or anti-GluA2/3 antibody. A single band was observed by anti-fluorescein antibody and this band was dramatically disappeared by NBQX.

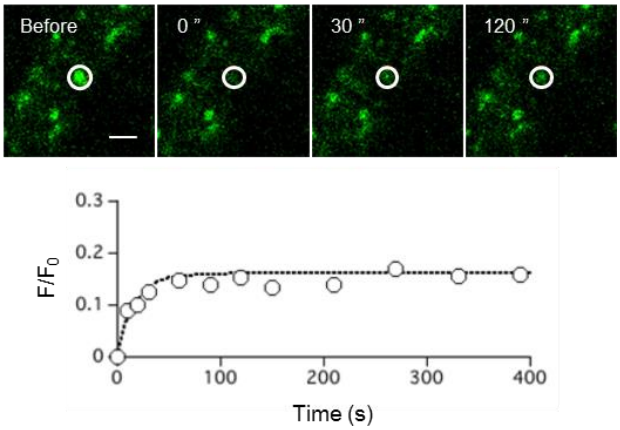
B. Cultured cortical neurons were treated with 1 μM of LiveReceptor AMPAR. After lysis of cultured neurons, the cell lysate was immunoprecipitated with anti-fluorescein antibody. The immunoprecipitates were analyzed by western blot using glutamate receptor-specific antibodies including GluA2 (AMPAR), GluN1 and GluN2 (NMDAR) and GluK2/3 and GluK5 (KAR). Only GluA2 was concentrated by anti-fluorescein (FL) antibody.

C. Cultured hippocampal neurons labelled with 1 μM of LiveReceptor AMPAR were fixed, permeabilized and stained by anti-GluA2 antibody. Fluorescein signals were well corresponding with the signal of anti-GluA2 antibodies. (Scale bar, 10 μm and 5 μm)



AMPARs in deep tissue in cultured slice tissue

Cultured slice tissue of mouse was stained by LiveReceptor AMPAR and fixed. After fixation, stained by anti-GluA2/3 antibody. x-y dimension shows a good concordance between LiveReceptor AMPAR and anti-GluA2/3 antibody.
However, x-z dimension shows that anti-GluA2/3 antibody stained the surface of slice tissue only. LiveReceptor AMPAR could penetrate into deep tissue and label AMPARs.
Black arrowhead : Top of sliced tissue
White arrowhead : Bottom of sliced tissue



FRAP analysis for diffusion dynamics of AMPARs

Cultured hippocampal neurons were treated with 1 μM of LiveReceptor AMPAR for 1 hour at 17℃. After washing cells, FRAP (fluorescence recovery after photo-bleaching) experiment was performed. The recovery ratio and diffusion coefficient were determined to be 16.2% and 0.090 $\mu m^2/s$, respectively. Detail information are described in Reference of Wakayama *et al*, *Nat. Commun*., **8**, 14850 (2017).

Product Information

[Manufacturer : FNA]

Product Name	Size	Catalog #	Storage
LiveReceptor AMPAR	10 μg	FDV-0018A	-20 ℃

NOTE

※ All products here are research use only, not for diagnostic use.
※ Specs might be changed for improvement without notice.
※ Company name and product name are trademark or registered mark.
※ Please contact your local distributors for orders, quote request and inquiry.

Your Local Distributor

Funakoshi Co., Ltd.
Address: 9-7 Hongo 2-Chome, Bunkyo-ku,
Tokyo 113-0033 JAPAN
Phone : +81-3-5684-6296
Fax : +81-3-5684-6297
Email : export@funakoshi.co.jp