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FRONTIERS IN LIFE SCIENCE

Research Use Only

Membrane potential imaging dye

Ap3
SHG Imaging Dye

For more information : http://www.funakoshi.co.jp/exports_contents/80646

Ap3 is the world first non-fluorescent, photo-stable SHG-imaging dye.

This product has been commercialized with a license from Keio University and University of Tsukuba.

MEMO What is the SHG-imaging?

Second harmonic generation (SHG) is a nonlinear optical process, the interaction of two photons with a nonlinear material generates photons with twice the energy. SHG imaging is a powerful tool to visualize cell / tissue structure and function.

For example, SHG imaging enables to measure membrane potential of axon or spine of neuron.

However, dyes which have been used so far emit strong fluorescence signals as well as SHG signals, and this fluorescence disturbs multimodal imaging with SHG signal.

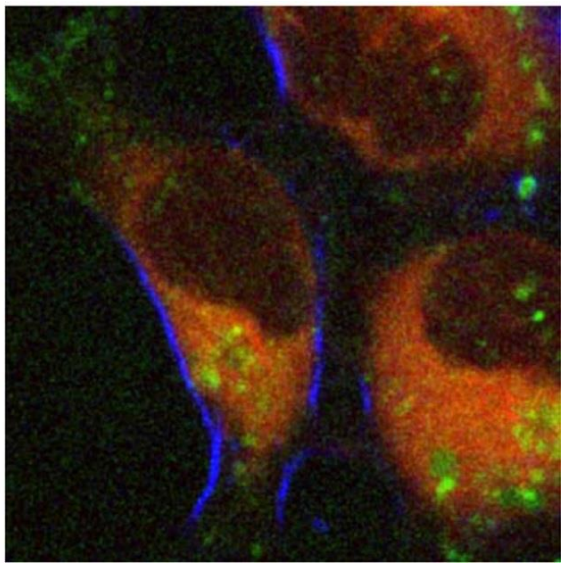
Our Ap3 overcomes this disadvantage, and enables true SHG signals in multimodal imaging by no interference of signals from other fluorescent molecules.

Features

- SHG-specific dye. No fluorescence signal.
- Enables multimodal imaging by using Ap3 and other fluorescent dyes simultaneously.
- Photo-stable
- Low photo-toxicity
- Membrane potential sensitive

Required system

- SHG detection system
- Laser illumination : 950 nm
- SHG signal detection : 465～485 nm
- The detection system is required to set on the opposite side of the objective lens.
- Besides, the installation of photomultiplier tube (PMT) is preferable on the detection side.



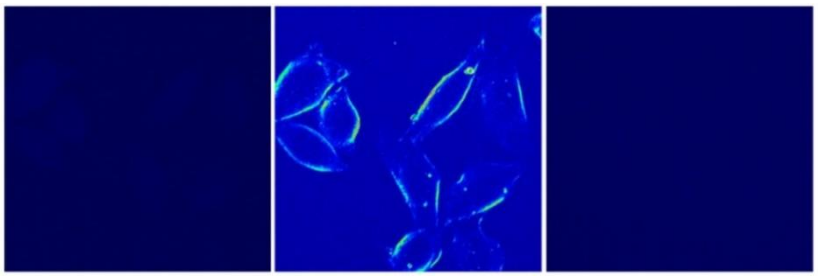
Multiple staining of Ap3 with other markers

Blue : Ap3 (Cell membrane)
Green : Endosome marker
Red : ER marker

Reference

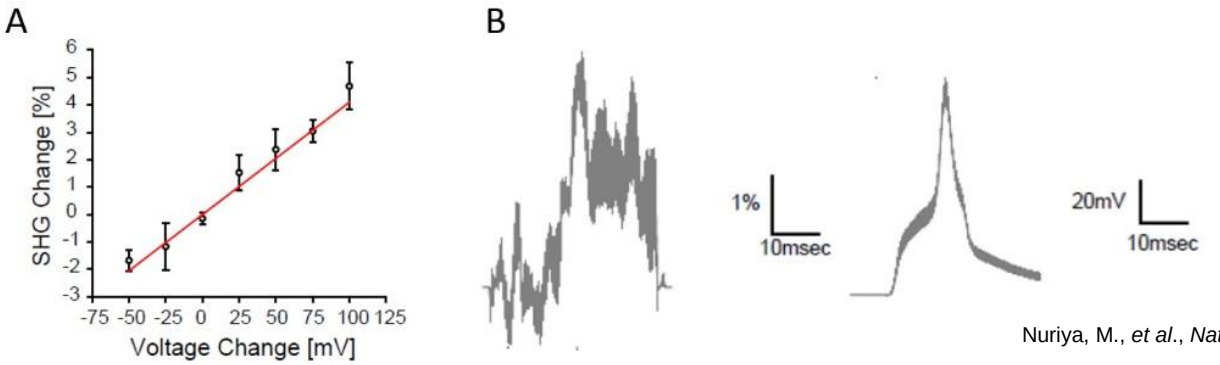
Nuriya, M., *et al., Nat. Commun.*, **7**, 11557 (2016).
Multimodal two-photon imaging using a second harmonic generation-specific dye

Data



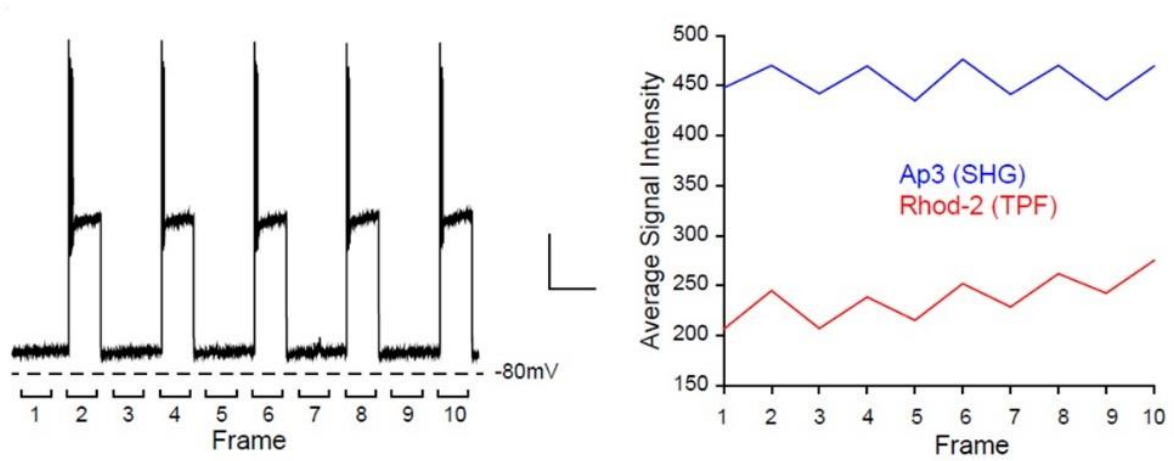
Fluorescent signal (570～625 nm) | SHG signal (465～485 nm) | Fluorescent signal (610～710 nm)

Fig.1 SHG signal and non-fluorescence of Ap3
Ap3 gives out SHG signal, however, no fluorescent signal is observed.



Nuriya, M., *et al*., *Nat. Commun*., 7, 11557 (2016).

Fig.2 Membrane potential changes by SHG imaging in brain slices.
A: Membrane potential sensitivity of SHG signals from Ap3 assessed by voltage-clamp.
B: SHG signal changes upon action potential in neurons. SHG signals were monitored by a point-scan protocol at the soma of patch-clamped neurons in brain slices.



Nuriya, M., *et al*., *Nat. Commun*., 7, 11557 (2016).

Fig.3 Simultaneous imaging of membrane potential and intracellular calcium dynamics in cortical neurons.
Dynamics of membrane potential and calcium concentration can be measured at the same time.

Product Information

[Manufacturer : FNA]

Product Name	Size	Catalog #	Storage
Ap3, SHG Imaging Dye	1 mg	FDV-0008	-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.

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