Fluorescent probes for cancer research from Goryo Chemical

CAT. No.	Product name	Description	Size
GC801	ProteoGREEN™-gGlu	For detection of GGT(γ-glutamyltranspeptidase) activity	20 μg × 10
GC811	EP-HMRG	For detection of DPP-Ⅳ (dipeptidyl peptidase-5) activity	30 nmol × 5
A101-01	MAR	For detection of hypoxia in live cell	25 μg × 5
GC611	GlycoGREEN™-βGal	For detection of β-galactosidase activity	30 nmol × 5
GC3004-01	OxiORANGE	To detect hydroxyl radical (・OH), hypochlorous acid (HClO)	100 nmol × 5
GC3006-01	HySOx	TTo detect hypochlorous acid (HClO)	20 ug × 5
GC3007-01	HYDROP	To detect intracellular hydrogen peroxide (H_2O_2)	30 nmol × 3
GC3008-01	HYDROP-EX	To detect hydrogen peroxide (H_2O_2), extracellular and in solutions	30 nmol × 3
SK3001-01	Hydroxyphenyl Fluorescein (HPF)	To detect hydroxyl radical (・OH), peroxynitrite ($ONOO^-$)	1 mg (DMF solution)
SK3001-02	Hydroxyphenyl Fluorescein (HPF)	Same as above	1 mg (solid)
SK3002-01	Aminophenyl Fluorescein (APF)	To detect hydroxyl radical (・OH), peroxynitrite ($ONOO^-$), hypochlorous acid (HClO)	1 mg (DMF solution)
SK3002-02	Aminophenyl Fluorescein (APF)	Same as above	1 mg (solid)
SK3003-01	NiSPY-3	To detect peroxynitrite ($ONOO^-$)	1 mg
A401-01	QuicGSH3.0	For the quantification of reduced glutathione (GSH)	25 nmol × 5

References

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OxiORANGE™
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Pre-Transplantation Blockade of TNF-α-Mediated Oxygen Species Accumulation Protects Hematopoietic Stem Cells. *Stem Cells.* 35. 989–1002. doi: 10.1002/stem.2524

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Abo M, Urano Y, Hanaoka K, Terai T, Komatsu T, Nagano T. 2011.
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Ueno T, Urano Y, Kojima H, Nagano T. 2006.
Mechanism-based molecular design of highly selective fluorescence probes for nitrative stress. *J Am Chem Soc.* 128. 10640-1. doi: 10.1021/ja061972v.

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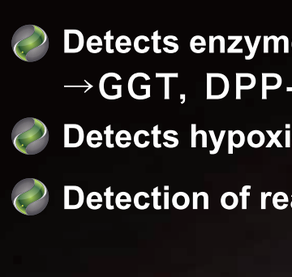
GORYO CHEMICAL

Fluorescent probes for cancer research from Goryo Chemical

☑ We offer the unique fluorescent probes.

- Detects enzyme activity in cancer cells with high sensitivity
  →GGT, DPP-Ⅳ, β-Gal
- Detects hypoxia easily in living cells
- Detection of reactive oxygen species with high specificity



Fluorescent imaging of breast adenocarcinoma cell

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Fluorescent probes for cancer research from Goryo Chemical

ProteoGREEN™-gGlu

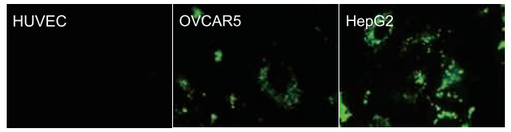
～High sensitivity to GGT activity～

※GGT: γ-glutamyl transpeptidase

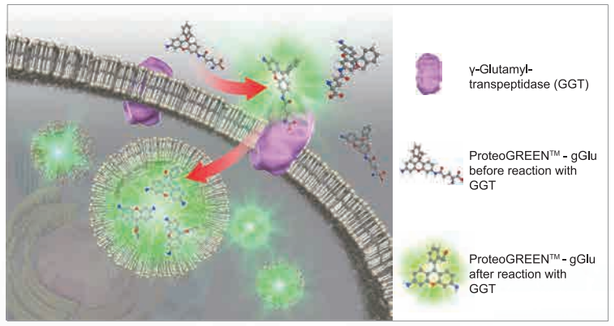
- ⚹ **High S/N ratio while emitting bright green fluorescence**
- ⚹ **Well-suited for live-cell or *in vivo* imaging of cancer cells**

Fig 1. Live-cell imaging of cancer cells or HUVEC cells

Cells were treated with ProteoGREEN™-gGlu. Spotted green fluorescence was detected in the cancer cell lines (OVCAR5, HepG2), whereas normal cell (HUVEC) shows no fluorescence.



Reaction of ProteoGREEN™-gGlu with GGT



GGT is a membrane-bound enzyme that is widely expressed in cells of the body. Compared to normal cells, expression and activity enhancement has been reported in many cancer cells, and it is involved in biosynthesis of antioxidant glutathione. ProteoGREEN™-gGlu is a green fluorescent probe in which the substrate of GGT is bound to the fluorophore HMRG (hydroxymethyl rhodamine green). Although it does not emit fluorescence before GGT reaction, hydrolyzation by the enzyme activity of GGT, results in a green fluorescence emission. HMRG shows cell membrane permeability and accumulates in the lysosomes due to electron gradient, resulting in a spot-like strong green fluorescence image.

MAR

～Detection of hypoxia in living cells～

- ⚹ **Applicable to spheroids**
- ⚹ **Simple and highly sensitive method compared with the Pimonidazole**

Principle of hypoxia detection: In a hypoxic environment, the activity of reductase is enhanced in the cell. MAR is a probe in which a fluorophore and a quencher are combined. Although it does not emit fluorescence before reaction, it turns into a phosphor by reductive elimination. This enables MAR to detect hypoxic environments in living cells.

Fig 2. Detection of hypoxic environment in spheroids

Results of spheroid-formed HepG2 cells reacted with MAR and incubated for 4 hours. Only the inside of the spheroid shows green fluorescence as a hypoxic environment was detected.

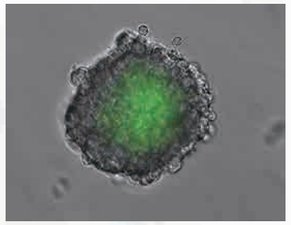
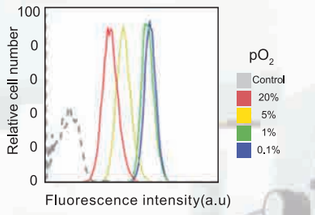


Fig 3. Analysis by flow cytometry of A549 cells stained by MAR under hypoxic conditions.

A549 cells were analyzed by flow cytometry after incubation for 6 hours under various oxygen concentrations and stained with 1 μM MAR. Fluorescent intensity increased as the oxygen concentration decreased, indicating that the probe can be used for flow cytometry.



GlycoGREEN™-βGal

～Rapid detection of β-Gal activity～

※β-Gal: β-galactosidase

- ⚹ **Applicable to both fixed and live cells**
- ⚹ **Well-suited for screening using flow cytometry**

Fig 4. Detection of β-Gal activity in cancer cells

Results of staining each cell with GlycoGREEN™-βGal. Almost no fluorescence is observed in normal cells (HUVEC), but green fluorescence is observed with good contrast in the cancer cell lines (OVCAR 5, HepG2).

ROSFluor™ series

～Specific detection of ROS～

※ROS: reactive oxygen species

- ⚹ **Low self-oxidation**
- ⚹ **Live-cell imaging with high contrast**

CAT. No.	Product name	Ex_{max} (nm)	Em_{max} (nm)	·OH	$ONOO^-$	HClO	H_2O_2
GC3004-01	**OxiORANGE™**	553	577	○	-	○	-
GC3006-01	**HySOx**	553	574	-	-	○	-
SK3007-01	**HYDROP™**	492	518	-	-	-	○
GC3008-01	**HYDROP-EX™**	492	518	-	-	-	○
SK3001-01	**HPF**	490	515	○	○	-	-
SK3002-01	**APF**	490	515	○	○	○	-
SK3003-01	**NiSPY-3**	490	515	-	○	-	-

※The permeability of HYDROP-EX through cell membranes is low, suited to measure hydrogen peroxide (H_2O_2) in solutions.

Related products

We also offer fluorescence probes with high specificity to detect metal ions. For details on the products, refer to the Website of Goryo Chemical.
http://goryochemical.com/en/

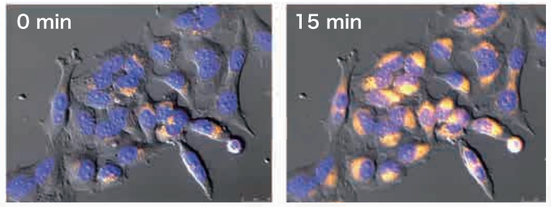


Fig 5. Detection of hROS in HeLa cell

OxiORANGE™ (orange) was added to the medium and incubated for 30 minutes. After the medium was exchanged to HBSS, 1 mM H_2O_2 was added to stimulate ROS production. Bright signal from OxiORANGE™ was detected. DIC image (gray), Hoechst 33342 (blue), and OxiORANGE™ (orange) is overlaid.

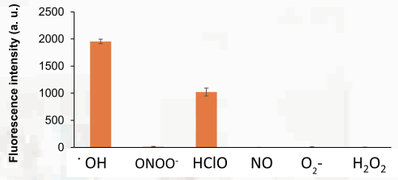


Fig 6. Reactivity of OxiORANGE™ with various ROS

Results of addition of each ROS generation system to phosphate buffer (0.1 M, pH 7.4) in which OxiORANGE ™ was dissolved. Hydroxy radicals, hypochlorous acid only reacted, the fluorescence intensity increased. Excitation wavelength: 553 nm, measurement wavelength: 577 nm

Related products

QuicGSH3.0

～Quantification of glutathione with real-time tracking～

- ⚹ **Well-suited for measuring intracellular GSH concentrations (K_d = 3.0 mM)**
- ⚹ **Quick and reversible response to the GSH concentration changes**
- ⚹ **Available for live-cell imaging**