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FRONTIERS IN LIFE SCIENCE

Research Use Only

PolyamineRED

PolyamineRED

< Intracellular Polyamine Detection Reagent>

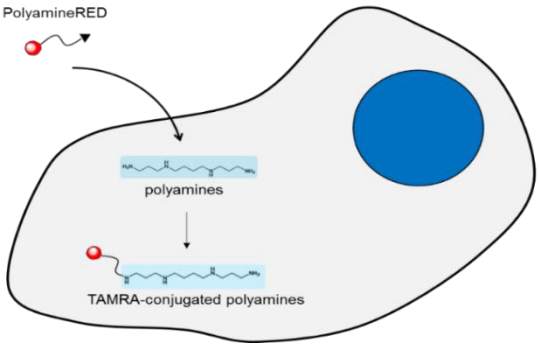
For more information : http://www.funakoshi.co.jp/exports_contents/81084

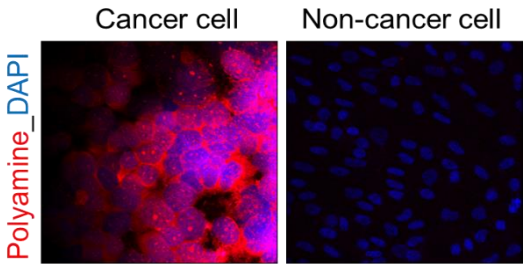
PolyamineRED is a reagent for imaging intracellular polyamines specifically.

This product has been commercialized with the support of Biofunctional Synthetic Chemistry Laboratory, RIKEN.

Background of Polyamines

The polyamine species, such as putrescine, spermidine and spermine etc. and its acetyl derivatives, are some of the essential class of metabolites which have liner alkyl structure with two or more amines. Polyamines have polycationic properties and show various biological functions. For example, polyamines interact with DNA and RNA in the nuclear and regulate gene expression. Polyamines also interact with negatively charged proteins and control its function. The major source of polyamines is amino acid ornithine. In case of mammalian, ornithine is converted to putrescine by ornithine decarboxylase (ODC), followed by synthesizing spermindine and spermine. As ODC is highly expressed in cancer cells, polyamines are considered as cancer marker. Several detection methods of polyamines are developed so far, but most of them are low-throughput systems using HPLC with polyamine standard compounds and, biological functions of polyamines have been unclear. PolyamineRED is the world's first reagent for detecting intracellular polyamines without any pre-treatment and cell lysis. This TAMRA (tetramethylrhodamine)-conjugated derivative of glycine propagyl ester specifically reacts with linear primary alkylamine and has cell-penetrating properties, specifically reacts with polyamines inside the cells and labelled polyamines with red fluorescent dye TAMRA.





Polyamine			Monoamine	Amino acid
Putrescine	Spermidine	Spermine	Epinephrine	Lysine
66%	78%	82%	<1%	2%

Selectivity of glycine propagyl ester to polyamines

Features

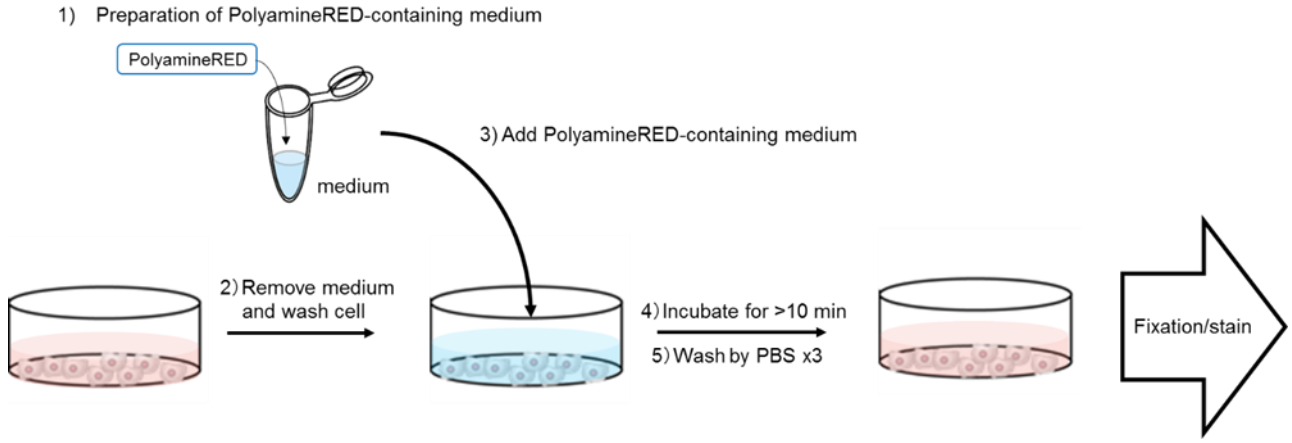
- Specifically labels polyamines
- Can be detected by filter set for Rhodamine (Ex./Em. = 560 / 585 nm)
- Cell permeable : compatible with live cell imaging
- No pretreatments required
- Can do semi-quantification of total polyamines amount (*) by intracellular fluorescence intensity.
  * Only total polyamines, not for each polyamine.

Reference

K. Vong, K. Tsubokura, Y. Nakao, T. Tanei, S. Noguchi, S. Kitazume, N. Taniguchi, K. Tanaka,
Chem. Commun., **53**, 8403 (2017).
Cancer cell targeting driven by selective polyamine reactivity with glycine propargyl esters.

Handling procedure (overview)

No pretreatment is required, just add PolyamineRED to culture medium!



Application Data

Three cancer cell lines (MCF7, MDA-MB-231 and SK-BR-3) and two non-cancer cells (MCF10A and human lymphocyte) were treated with 30 μM of PolyamineRED for 10 min. After incubation, cells were washed three times by PBS, followed by DAPI staining and formalin fixation. Images were obtained at Ex/Em=560 nm/585 nm for TAMRA and at Ex/Em=358 nm/461 nm for DAPI. TAMRA fluorescence was detected in cancer cell lines.

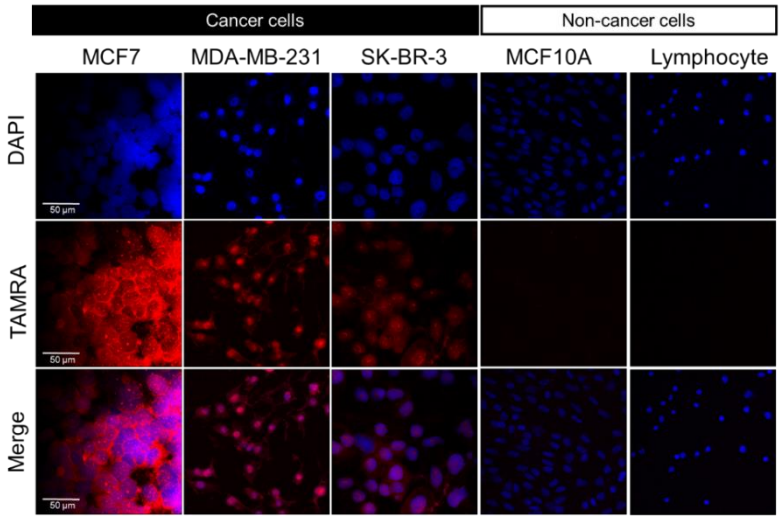


Fig.1 Polyamine imaging in cancer or non-cancer cells

MDA-MB-231 cells were treated with 30 μM of PolyamineRED for 10 min. After incubation, cells were washed three times by PBS, followed by DAPI-staining and formalin fixation. Images were obtained at Ex/Em=560 nm/585 nm for TAMRA and at Ex/Em=358 nm/461 nm for DAPI.
Major TAMRA signal was detected in nucleus. This indicates polyamines in MDA-MB-231 are mainly localized in nucleus.

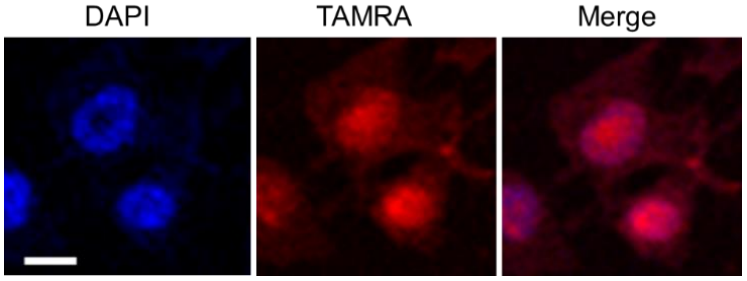


Fig.2 Intracellular distribution of polyamines in MDA-MB-231 cancer cell lines

Product Information

[Manufacturer : FNA]

Product Name	Size	Catalog #	Storage
PolyamineRED	0.5 mg	FDV-0020	-20 ℃

NOTE

※ All products here are research use only, not for diagnostic use.
※ Specs might be changed for improvement without notice.
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