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FRONTIERS IN LIFE SCIENCE

Research Use Only

AcroleinRED

AcroleinRED

< Cell-based Acrolein Detection Reagent >

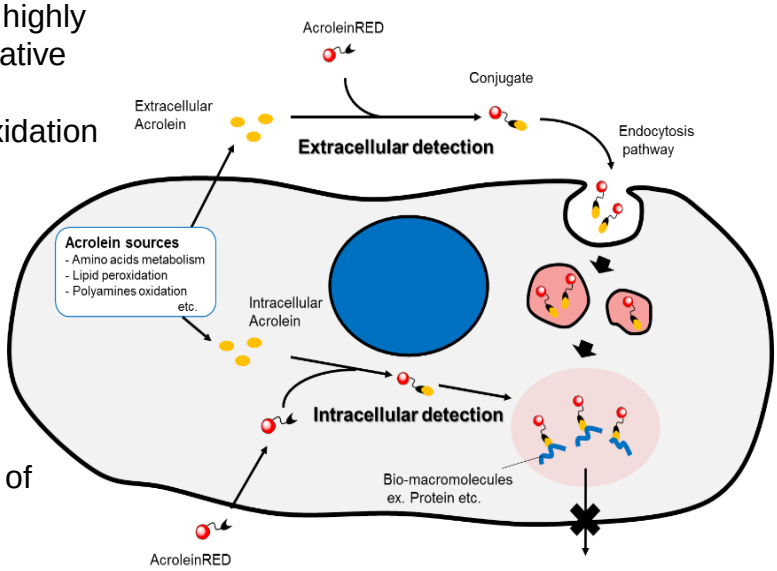
For more information : http://www.funakoshi.co.jp/exports_contents/81137

AcroleinRED is a reagent for detecting of acrolein in live cells.

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

Background of Acroleins and AcroleinRED

Acrolein, the simplest α,β-unsaturated aldehyde, is highly toxic metabolite for cells and considered as an oxidative stress marker.
The physiological sources of acrolein in cells are oxidation of threonine, polyamines and unsaturated lipids.
Recent studies indicate acrolein is more toxic to cells than is reactive oxygen species (ROS) such as hydrogen peroxide (H_2O_2) and hydroxyl radicals. Because of its high reactivity, acrolein in the cell immediately modifies various biomolecules including DNA, RNA and proteins, and subsequently impairs their functions.
Despite its biological importance, detection method of acrolein was limited.



AcroleinRED is the world's first cell-based acrolein-detection reagent under the live cell conditions without any pre-treatment. The principle of this reagent is based on phenylazide-acrolein click chemistry (Ref.1).

AcroleinRED specifically detects both extracellular and intracellular acrolein, and can perform semi-quantitative measurement of cellular acrolein in live cells.

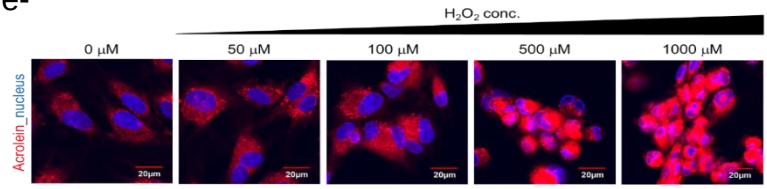


Fig.1 Observation of oxidative stress-induced acrolein production

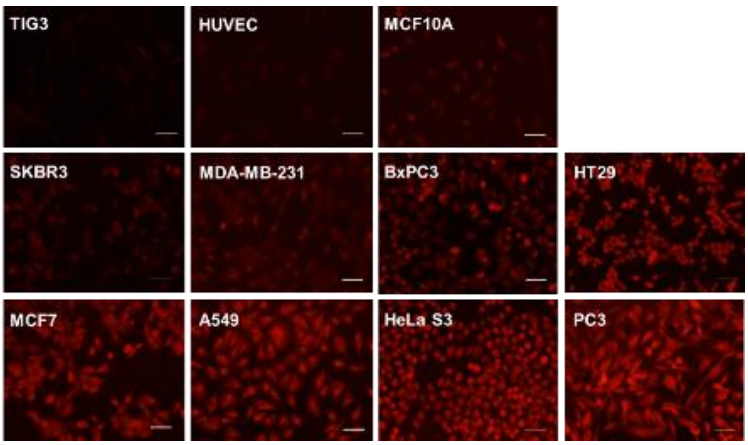
Features

- Specifically labels acroleins
  - no reaction against other unsaturated aldehyde such as crotonaldehyde, trans-2-octenal, and methacrolein or styrene.
- 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 acrolein amount by intracellular fluorescence intensity.

Reference

1. A.R. Paradipt, M. Taichi, I. Nakase, E. Saigitbatalova, A. Kurbangalieva, S. Kitazume, N. Taniguchi, K. Tanaka ACS Sens., 1, 623-632 (2016)

Application Data



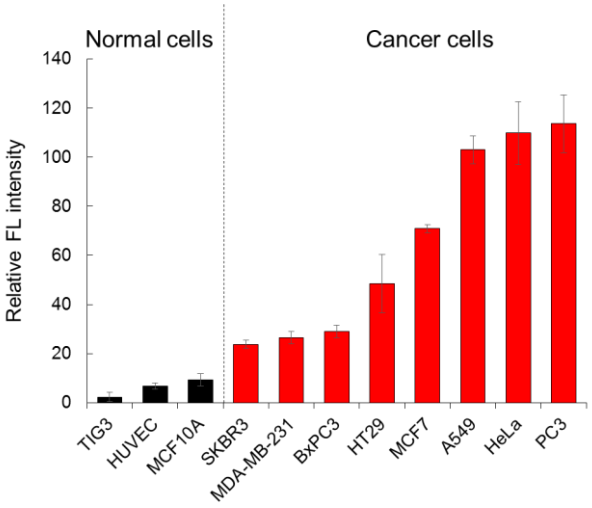


Fig.2 Comparison of acrolein-production levels of various cell lines by AcroleinRED

Three non-cancer cells (TIG4, HUVEC and MCF10A) and eight cancer cell lines were treated with 22.5 μM of AcroleinRED for 30 min at 37oC. Red fluorescent signals of cancer cells were much higher than that of normal cells. Furthermore, AcroleinRED revealed that acrolein-production levels of eight cancer cell lines are significantly different from each other.

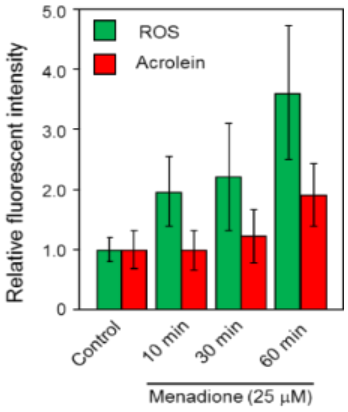


Fig.3 Comparison of acrolein-production levels of various cell lines by AcroleinRED

HUVEC were treated with 25 μM menadione, an inducer of reactive oxygen species, for 0-60 min and subsequently treated with Total ROS detection dye (Enzo Life Science) and AcroleinRED for 60 min. After labeling, fluorescent signal of ROS (green) or acrolein (red) were observed. By the addition of menadione, ROS were immediately increased, however, the acrolein level started to increase 60 min after menadione treatment. Namely, the late stage production of acrolein through ROS-initiated process was clearly imaged by using AcroleinRED.

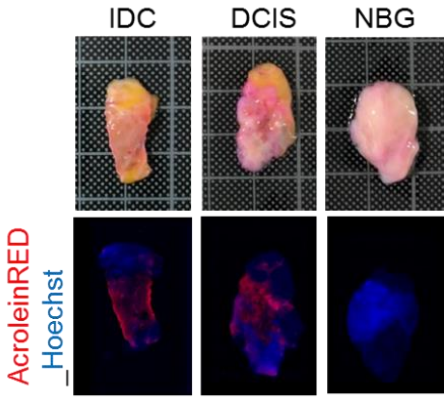


Fig.4 Visualization of tumors from breast gland tissues

Surgical tissues derived from breast cancer patients or a healthy control were immediately incubated with AcroleinRED (20 μM)/Hoechst mixed solution under non-fixed condition for 5 min. After washing tissues by PBS, double-stained tissues were observed by fluorescent microscopy. AcroleinRED visualized tumor region of patient-derived breast gland, but not derived from healthy control.

IDC; invasive ductal carcinoma, DCIS; ductal carcinoma in situ, NBG; normal breast gland

Product Information

[Manufacturer : FNA]

Product Name	Size	Catalog #	Storage
AcroleinRED	0.5 mg	FDV-0022	-20 ℃

NOTE

※ All products here are research use only, not for diagnostic use.
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