PUROMYCIN ACTIVITY-BASED SENSING PROBES FOR MOLECULAR IMAGING AND HISTOCHEMISTRY

Tech ID: 29250 / UC Case 2018-124-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20210061842	03/04/2021	2018-124

BRIEF DESCRIPTION

A novel class of puromycin activity-based sensing probes containing analyte-specific responsive triggers have been synthesized and utilized for molecular imaging and histochemistry. After specific reaction between the trigger on the probe and target analyte, free puromycin molecules will be released and incorporated into nascent peptides. These incorporated puromycin can be detected after immunostaining, thus offering a highly sensitive method for detection of target analytes due to no leakage problem (as found in some reported fluorescent probes) and high signal-to-noise level from immunostaining.

The syntheses of the probes are highly versatile, and representative examples for detection of reactive oxygen species (ROS), reactive sulfur species (RSS), reactive carbonyl species (RCS), ROS scavengers, and redox active metal ions have been demonstrated.

One exemplary probe is Peroxymycin-1, which contains H2O2-responsive aryl boronate conjugated to puromycin through carbamate linkage. Peroxymycin-1 shows robust performance on molecular imaging of H2O2 in cell culture and histochemical analysis of H2O2 level in tissue samples harvested from small animals. It has been further employed for detection of elevated H2O2 level in liver tissues from a murine model of non-alcoholic fatty liver disease (NAFLD), suggesting its potential for studying disease pathology associated with H2O2 as well as disease diagnosis and monitoring of treatment progress.

SUGGESTED USES

The puromycin activity-based sensing probes can be utilized for studying target analytes, such as ROS, RSS, RCS, ROS scavengers, and redox active metal ions in cell cultures, and also in tissues, organs, or animals. With these probes, researchers can get a better understanding of these analytes roles in cell-cell communications and signaling pathways, which are underexplored as conventional fluoescent probes often do not work well in imaging tissues, organs, or animals.

The probes are also potential tools for studying disease pathology associated with change in level of target analytes. For example, in a murine model of non-alcoholic fatty liver disease (NAFLD), one of the representative probes, Peroxymycin-1, successfully revealed an increase in H2O2 level in liver tissues.

It is anticipated that the probes can be further exploited in disease diagnosis and monitoring therapy progress by detecting target analyte level.

ADVANTAGES

Selective and sensitive imaging of target analytes in a variety of biological samples.

Unlike other fluorescent probes, this novel class of probes does not have intracellular leakage problems.

The probes deliver high signal-to-noise level from immunostaining.

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OTHER INFORMATION

KEYWORDS

puromycin, probe, histochemistry, molecular imaging, analyte

CATEGORIZED AS

» **Imaging**
» Medical
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» **Medical**
» Diagnostics
» Imaging
» Research Tools
» Screening
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RELATED CASES

2018-124-0

RELATED MATERIALS

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