

UREA-OXAZIRIDINE LIBRARY SYNTHESIS AND APPLICATIONS

Tech ID: 29589 / UC Case 2019-002-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,155,530	10/26/2021	2019-002

BRIEF DESCRIPTION

Chemoselective conjugation is achieved through redox reactivity by reacting a nitrogen-transfer oxidant with a thioether substrate in an aqueous environment to form a stable conjugation product. Developed by UC Berkeley researchers, this platform utilizes Redox-Activated Chemical Tagging strategies for methionine-based protein functionalization. Specifically, novel urea-oxaziridine compounds serve as oxidant-mediated reagents for direct biomolecule functionalization, converting target methionine residues into their corresponding sulfimide conjugation products. This biocompatible reaction occurs efficiently under mild, aqueous conditions, offering a powerful tool for modifying complex proteins without disrupting their native structures or biological activities.

SUGGESTED USES

»

Site-specific modification of therapeutic proteins and antibodies for targeted drug delivery applications

»

Fluorescent labeling and chemical tagging of native proteins within complex biological mixtures or cellular lysates

»

Development of stable bioconjugates for diagnostic assays and advanced biomaterial synthesis

»

Functionalization of industrial enzymes to enhance stability, operational longevity, or substrate binding

»

Structural and functional studies of oxidative stress and methionine oxidation pathways in living systems

ADVANTAGES

»

Provides exceptional chemoselectivity toward methionine residues over other competing amino acids

»

Operates efficiently in mild, biocompatible, and completely aqueous environmental conditions

»

Eliminates the need for transition metal catalysts, reducing toxicity risks in downstream biological use

CONTACT

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INVENTORS

» Chang, Christopher J.

OTHER INFORMATION

CATEGORIZED AS

» **Biotechnology**

» Other

» **Research Tools**

» Reagents

RELATED CASES

2019-002-0

»

Forms a highly stable sulfimide conjugation linkage that resists degradation during processing

»

Enables direct modification of native, unengineered proteins without requiring genetic alterations

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Thiophosphorodichloridate Reagents For Chemoselective Histidine Bioconjugation](#)
- ▶ [Puromycin Activity-Based Sensing Probes For Molecular Imaging And Histochemistry](#)
- ▶ [Activity-Based Ratiometric FRET Probe Detects the Changes in Labile Copper Pools](#)
- ▶ [Homoallylamines As Formaldehyde-Responsive Triggers With Imaging Applications](#)
- ▶ [Diagnostic Colorimetric Assay](#)
- ▶ [Tandem Activity-Based Sensing and Labeling Strategy for Reactive Oxygen Species Imaging](#)
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