FLUORESCENT PROBE FOR SELECTIVE IMAGING OF CARBON MONOXIDE IN LIVING CELLS USING PALLADIUM-MEDIATED CARBONYLATION

Tech ID: 23561 / UC Case 2014-010-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,329,191	05/03/2016	2014-010

BRIEF DESCRIPTION

Carbon monoxide (CO) is a well known toxic gas, but emerging research also suggest potentially beneficial effects of temporarily increased levels of CO in attenuating deleterious effects of reactive oxygen species (ROS). To date the study and evaluation of the effects of CO have relied on detecting gross anatomical change of some observable parameter, such as infarct size in the studies of CO on ischemia/reperfusion or offline extracellular measurements using myoglobin as a colorimetric readout. These macroscopic and colorimetric outputs do not provide detailed information about cellular signaling pathways.

The inventors have designed, synthesized, and evaluated a new type of chemical reagent for selective CO detection in living cells by exploiting palladium-mediated carbonylation chemistry. The technology is based on a cyclometallated aryl-palladium compound attached to a BODIPY–type fluorophore, which reacts with CO in a carbonylation reaction to produce a highly fluorescent amino acid species with concomitant loss of palladium. The probe displays an increase in fluorescence in both cuvettes and live cells.

Carbon Monoxide Probe 1 (COP-1) represents a unique first-generation chemical tool that features a robust turn-on response to CO with selectivity over reactive nitrogen, oxygen, and sulfur species. It can be used to detect CO in aqueous buffer and in live-cell specimens, providing a potentially powerful approach for examining the chemical composition of biological systems.

SUGGESTED USES

- in vitro studies on effects of CO on cells and tissues
- study the effects of CO releasing molecules
- investigation of biochemical pathways

ADVANTAGES

- visual (fluorescent) tool for detecting CO (Qualitative and quantitative detection)
- easy to synthesize
- non-toxic
- highly selective for CO

RELATED MATERIALS

» Brian W. Michel, Alexander R. Lippert, and Christopher J. Chang: A Reaction-Based Fluorescent Probe for Selective Imaging of Carbon Monoxide in Living Cells Using a Palladium-Mediated Carbonylation; J. Am. Chem. Soc., 2012, 134 (38), pp 15668–15671.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

» **Biotechnology**
» Health
» **Medical**
» Diagnostics
» Research Tools
» Screening
» **Research Tools**
» Cell Lines
» Reagents
» Screening Assays

RELATED CASES

2014-010-0

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