

**Title:** *Near Infrared Fluorescent Probe for Imaging Reactive Species Damage in Live Cells*

*UMD15-06*

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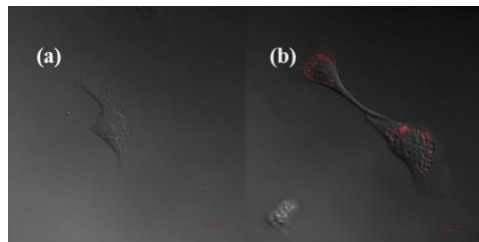
**Applications:** A novel chemical compound with beneficial properties for *in vivo* imaging of cellular damage, for use in screening candidate skin protectant compounds or assessing cellular damage in safety testing of potential cosmetic products.

**Benefits:**

- Excellent reactivity to many reactive species such as superoxide radicals.
- Diffusible through cell membrane but retained by cells upon activation.
- Very good photostability.
- Absorbs and emits at wavelengths not interfering with cellular pigments.

**Technology Description:** Reactive Oxygen Species (ROS) are oxygen metabolites that are highly active in modifying cellular macromolecules, and which have long been known to be related to health and diseases. During times of stress, ROS can participate in chemical reactions which lead to significant cellular damage. There is a need for rapid, easy-to-use methods to spatially diagnose the effects of ROS in living cells in real-time, specifically for sensitive, rapidly responsive and reversible “turn-on” sensors which actively fluoresce only in the presence of ROS. A few such sensors have been available, but suffer from certain disadvantages such as poor sensitivity, poor reactivity towards common cellular ROS, and poor photostability (photo bleaching). The present invention comprises a novel chemical compound that is a near-infrared (NIR) ROS sensor with excellent reactivity to the biologically relevant common ROS. The compound is activated by exposure to ROS, thus changing its fluorescence properties, enabling detection of the presence of ROS molecules. This compound is capable of detecting lysosome ROS in live cells with subcellular resolution.

**Patent Status:** The invention is the subject of a pending PCT patent application. The compound is novel and is patentable as a new composition of matter.



Bovine aortic endothelial cells imaged with the compound of the invention, in (a) the absence or (b) presence of H<sub>2</sub>O<sub>2</sub>.

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