Chem Sci J 2018, Volume 9
DOI: 10.4172/2150-3494-C2-021

8th European Chemistry Congress

June 21-23, 2018 | Paris, France

Fluorescent probes for imaging of intracellular and *in vivo* ROS

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Reactive oxygen species (ROS) are attracting increasing attention because of their essential role in many biological processes, including signal transduction, inflammation, carcinogenesis and neurodegenerative diseases. Under stress or stimulation by exogenous chemicals, aberrantly production of ROS may attack cellular structures or biomolecules, such as proteins, liposomes and DNA, leading to cancer, diabetes, and neurodegenerative disorders. Oxidative modifications of DNA bases may induce mutations and even cancer, if not repaired in a timely manner. The DNA damage elicited by ROS may also promote activation of programmed cell death (apoptosis). It is thus critical to monitor dynamic changes of intracellular ROS, especially near DNA. For many years, we have focused on developing novel ROS-identifying fluorescent probes and have used these to successfully detect biomarkers (e.g. H_2O_2 OH and HClO) in biological systems. In this presentation, we report a series of fluorescent probes based on some specific peptides for the detection of the intracellular change of H_2O_2 level close proximity to nuclear and mitochondrial DNA. Moreover, a multifunctional probe which can distinguish endogenously generated H_2O_2 between living and apoptotic cells with different emission wavelengths has also been developed. Additionally, fluorescent sensors based on new reaction mechaniam have been prepared for the detection and imaging of hydroxyl radical and hypochlorous acid.

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