



Cell Technology, Inc

Fluoro: Catalase™

Fluorescent Catalase Detection Kit

Key Benefits

- Sensitive Fluorescent Assay
- Enzyme Positive Control included in kit.
- Can monitor multiple time points to follow kinetics.
- One-step, no wash assay.
- Adaptable for High Throughput format.
- Monitors enzymatic activity.

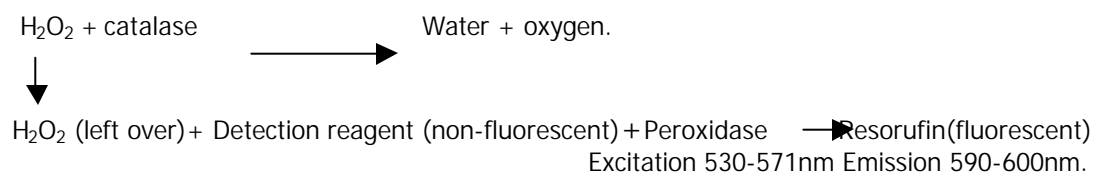
Assay Principle

Catalase is an antioxidant enzyme that catalyses the decomposition of hydrogen peroxide (H_2O_2) to water and oxygen. Catalase is ubiquitously expressed in mammalian and non-mammalian aerobic cells containing the cytochrome system. The enzyme has been isolated from various sources, including bacteria and plant cells (1-3). Catalase activity varies greatly from tissue to tissue. Highest activity is seen in liver and kidney, while lowest activity is seen in connective tissue (3). In eukarotic cells, catalase is concentrated in organelles called peroxisomes (4).

The production of hydrogen peroxide in eukaryotic cells is an end product result of various oxidases and superoxide dismutase reactions. Accumulation of H_2O_2 can result in cellular damage through oxidation of proteins, DNA and lipids thus resulting in cell death and mutagenesis (8-11). H_2O_2 role in oxidative stress related diseases have been widely studied (8,12).

The Fluoro Catalase detection kit is sensitive assay that utilizes a non- fluorescent detection reagent to measure H_2O_2 substrate left over from the catalase reaction (5-6).

Reaction:



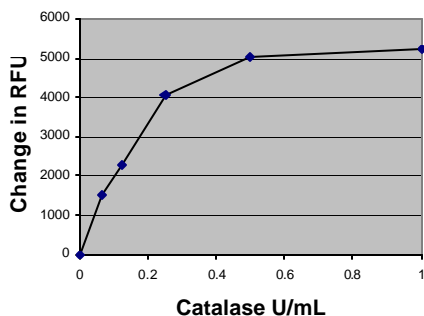


Figure 1. Catalase activity was detected using the Fluoro Catalase kit. The reaction contained 20uM H₂O₂ (final) per well and the indicated amounts of catalase in 1X reaction Buffer. The reaction was incubated for 30 minutes at room temperature. Next 100uL of Reaction cocktail was added to each well and the reaction incubated for another 10 minutes in the dark at room temperature. Fluorescence was measured at excitation 530nm and emission detected at 590nm. The graph reports the change in fluorescence, observed fluorescence from negative control (no catalase) minus catalase sample fluorescence.

Ordering Information

| Catalog # | Size | Price (US\$) |
|--------------|------|--------------|
| FLOCAT 100-3 | 500 | 225 |

References:

1. Deisseroth, A., and Dounce, A.L. Catalase: Physical and chemical properties, mechanism of catalysis, and physiological role. *Physiol. Rev.*, 50, 319-375 (1970).
2. Sebastian Mueller, Hans-Dieter Riedel and Wolfgang Stremmel. Determination of Catalase Activity at Physiological Hydrogen Peroxide Concentrations. [Analytical Biochemistry, Volume 245, Issue 1](#), 1 February 1997, Pages 55-60.
3. Deisseroth, A., and Dounce, A.L. Catalase: Physical and chemical properties, mechanism of catalysis, and physiological role. *Physiol. Rev.*, 50, 319-375 (1970).
4. Marcel Zámocký and Franz Koller . Understanding the structure and function of catalases: clues from molecular evolution and in vitro mutagenesis. *Progress in Biophys. Mol. Biol.*, 72, 19-66 (1999).
5. Mingjie Zhou, Zhenjun Diwu, Nataliya Panchuk-Voloshina and Richard P. Haugland. A Stable Nonfluorescent Derivative of Resorufin for the Fluorometric Determination of Trace Hydrogen Peroxide: Applications in Detecting the Activity of Phagocyte NADPH Oxidase and Other Oxidases. *Anal Biochem* 253, 162 (1997).
6. J. G. Mohanty, Jonathan S. Jaffe, Edward S. Schulman and Donald G. Raible. A highly sensitive fluorescent micro-assay of H₂O₂ release from activated human leukocytes using a dihydroxyphenoxazine derivative. *J. Immunol Methods* 202, 133 (1997).
7. Tatyana V.Votyakova ,Ian J.Reynolds. Detection of hydrogen peroxide with Amplex Red:interference by NADH and reduced glutathione auto-oxidation. *Archives of Biochemistry and Biophysics*, 431:138-144 (2004).
8. Jingxiang Bai, Ana M. Rodriguez, J. Andres Melendez, and Arthur I. Cederbaum. Overexpression of Catalase in Cytosolic or Mitochondrial Compartment Protects HepG2 Cells against Oxidative Injury. *J. Biol. Chem.*, Sep 1999; 274: 26217 - 26224
9. Tada-Oikawa, S. et al., *FEBS Lett.*, **442**, 65-69 (1999).
10. Hampton, M.B., and Orrenius, S., *FEBS Lett.*, **414**, 552-556 (1997).
11. Kowaltowski, A.J. et al., *FEBS Lett.*, **473**, 177-182 (2000).
12. Tome, M.E. et al., *Cancer Res.*, **61**, 2766-2733 (2001).

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