**Product overview**

Abcam's GSH/GSSG Ratio Detection Assay Kit (Fluorometric - Green) (ab138881) provides an ultrasensitive assay to quantitate glutathione in the sample.

There are quite a few reagents or assay kits available for quantitating thiols in biological systems. However, most commercial kits either lack sensitivity or have tedious protocols. ab138881 uses a proprietary non-fluorescent dye that becomes strongly fluorescent upon reacting with GSH. With a one-step fluorimetric method, the kit can detect as little as 1 picomole of GSH or GSSG in a 100 µL assay volume. The assay can be performed in a convenient 96-well or 384-well microtiter-plate format and readily adapted to automation without a separation step. Its signal can be easily read by a fluorescence microplate reader at Ex/Em = 490/520 nm.

**NOTE:** For measuring GSH Standard only, there is enough reagent provided to perform 200 tests.

This product contains a DMSO-soluble probe. If you prefer to use a water-soluble probe, we recommend using GSH/GSSG Ratio Detection Assay Kit II (Fluorometric - Green) (ab205811).

**Notes**

Glutathione (GSH) is a tripeptide that contains L-cysteine, L-glutamic acid and glycine. It is the smallest intracellular protein thiol molecule in the cells, which prevents cell damage caused by reactive oxygen species such as free radicals and peroxides. Glutathione exists in reduced (GSH) and oxidized (GSSG) states. Reduced glutathione (GSH) is a major tissue antioxidant that provides reducing equivalents for the glutathione peroxidase (GPx) catalyzed reduction of lipid hydroperoxides to their corresponding alcohols and hydrogen peroxide to water. In the GPx catalyzed reaction, the formation of a disulfide bond between two GSH molecules generates oxidized glutathione (GSSG). The enzyme glutathione reductase (GR) recycles GSSG to GSH with the simultaneous oxidation of β-nicotinamide adenine dinucleotide phosphate (β-NADPH2).
In healthy cells, more than 90% of the total glutathione pool is in the reduced form (GSH). When cells are exposed to increased levels of oxidative stress, GSSG accumulates and the ratio of GSSG to GSH increases. An increased ratio of GSSG-to-GSH is an indication of oxidative stress. The monitoring of reduced and oxidized GSH in biological samples is essential for evaluating the redox and detoxification status of the cells and tissues against oxidative and free radicals mediated cell injury.

**Tested applications**

**Suitable for:** Functional Studies

**Properties**

**Storage instructions**

Store at -20°C. Please refer to protocols.

<table>
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<th>Components</th>
<th>100 tests</th>
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<tr>
<td>Assay Buffer</td>
<td>1 x 25ml</td>
</tr>
<tr>
<td>DMSO</td>
<td>1 x 200µl</td>
</tr>
<tr>
<td>GSH Standard</td>
<td>1 x 62µg</td>
</tr>
<tr>
<td>GSSG Probe</td>
<td>1 vial</td>
</tr>
<tr>
<td>GSSG Standard</td>
<td>1 x 124µg</td>
</tr>
<tr>
<td>Thiol Green Indicator</td>
<td>1 vial</td>
</tr>
</tbody>
</table>

**Relevance**

Glutathione is a small peptide composed of three amino acids: cysteine, glutamic acid, and glycine and is present in tissues in concentrations as high as one millimolar. Glutathione is the principal intracellular low-molecular-weight thiol that plays a critical role in the cellular defense against oxidative and nitrosative stress in mammalian cells. Diminished glutathione levels have been observed in the early stages of apoptosis.

**Applications**

Our **Abpromise guarantee** covers the use of **ab138881** in the following tested applications.

The application notes include recommended starting dilutions; optimal dilutions/concentrations should be determined by the end user.

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<td>Use at an assay dependent concentration.</td>
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**Images**
GSH in reduced state measured in cell lysates showing quantity (umol) per 1 mln cells.

Samples with the concentration of 1e7-1e8 cells/mL were used. Samples were diluted 10-1000 fold.

Total GSH measured in cell lysates showing quantity (umol) per 1 mln cells.

Samples with the concentration of 1e7-1e8 cells/mL were used. Samples were diluted 10-1000 fold.
GSH in reduced state measured in tissue lysates showing quantity (umol) per milligram of extracted protein of tested sample.

Protein concentration for samples varied from 6 mg/mL to 16 mg/mL. Samples were diluted 10-100 fold.

Total GSH measured in tissue lysates showing quantity (umol) per milligram of extracted protein of tested sample.

Protein concentration for samples varied from 6 mg/mL to 16 mg/mL. Samples were diluted 10-100 fold.
Functional Studies - GSH/GSSG Ratio Detection Assay Kit (Fluorometric - Green) (ab138881)

GSH in reduced state measured in biological fluids showing concentration (µM) in tested samples. Human samples were diluted 10 fold. Rat sample was diluted 10-1000 fold.

Total GSH measured in biological fluids showing concentration (µM) in tested samples. Samples were diluted 10-100 fold.

Total GSH dose responses were measured with ab138881 in a black 96-well plate using a fluorescence microplate reader. 50 µl of GSSG standards (0.01 to 5 µM), GSH-containing samples or blank control were added into each well, and then 50 µl of Total GSH Reaction Mixture was added. Fluorescence intensity was measured at Ex/Em = 490/520 nm after 30 minutes incubation.
Reduced GSH dose responses were measured in a black 96-well plate with ab138881 using a fluorescence microplate reader. 50 µl of GSH standards (0.01 to 5 µM) or blank control was added into each well, and then 50 µl of GSH Assay Mixture was added. The fluorescence intensity was measured at Ex/Em = 490/520 nm after 30 minutes incubation.

Please note: All products are "FOR RESEARCH USE ONLY AND ARE NOT INTENDED FOR DIAGNOSTIC OR THERAPEUTIC USE"

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