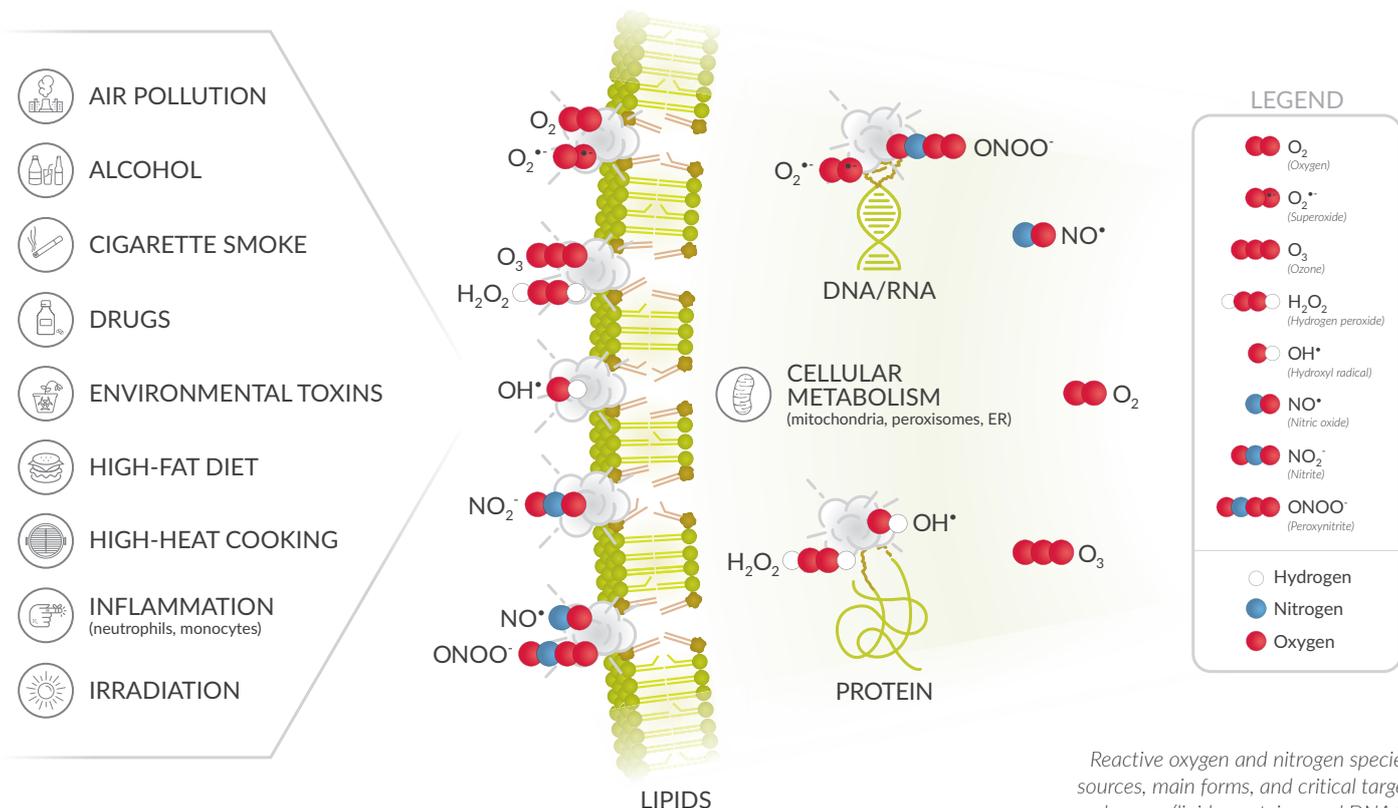


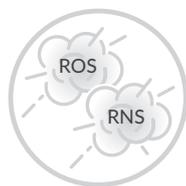
# Oxidative Stress Assays

Oxidative stress occurs when there is an imbalance between the production of chemically reactive species such as reactive oxygen, nitrogen, and sulfur species (ROS, RNS, RSS) and antioxidant defense mechanisms. Uncontrolled oxidation can disrupt redox signaling and cause injury to cellular components like lipids, proteins, and DNA/RNA, resulting in irreparable damage and eventual cell death. Cayman offers a collection of assays for both the direct measurement of reactive species as well as markers of oxidative stress.

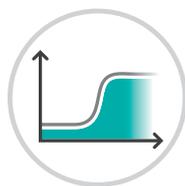


Reactive oxygen and nitrogen species: key sources, main forms, and critical targets for damage (lipids, proteins, and DNA/RNA).

## Explore Cayman's Oxidative Stress Assays



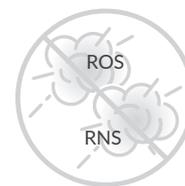
ROS & RNS



Enzyme Activity



Markers of Oxidative Stress



Antioxidant Detection & Activity

A Guide to Oxidative Stress:  
**Markers & Detection Tools**



Download the Guide  
[www.caymanchem.com/oxstress-guide](http://www.caymanchem.com/oxstress-guide)

# ROS & RNS Assays

## ROS Assays

ROS are produced from molecular oxygen during normal cellular processes or in response to harmful exogenous factors. ROS have central roles in redox regulation and cell signaling, but excessive ROS production triggers oxidative stress.

Item No.	Product Name
600050	Hydrogen Peroxide Assay Kit
701600	Mitochondrial ROS Detection Assay Kit
601520	ROS Detection Cell-Based Assay Kit (DCFDA)
601290	ROS Detection Cell-Based Assay Kit (DHE)

## Assay Kits for ROS-producing Enzymes

Item No.	Product Name
700160	Myeloperoxidase Peroxidation Fluorometric Assay Kit
600620	Neutrophil Myeloperoxidase Activity Assay Kit
10010895	Xanthine Oxidase Fluorometric Assay Kit

## RNS Assays

RNS are also produced during oxidative stress. Nitric oxide synthase (NOS) uses L-arginine and O<sub>2</sub> to produce nitric oxide (NO•). Nitrate and nitrite are degradation products of NO that can be used as an indirect measure of NO production.

Item No.	Product Name
780001	Nitrate/Nitrite Colorimetric Assay Kit
760871	Nitrate/Nitrite Colorimetric Assay Kit (LDH method)
780051	Nitrate/Nitrite Fluorometric Assay Kit
781001	NOS Activity Assay Kit

## Assay Kits for ROS-detoxifying Enzymes

Item No.	Product Name
707002	Catalase Assay Kit *
703102	Glutathione Peroxidase Assay Kit
706002	Superoxide Dismutase Assay Kit

\*Item No. 700910 is available without H<sub>2</sub>O<sub>2</sub> to our international customers with shipping restrictions.

# Cellular Metabolism Assays & Reagents

Cellular metabolism generates energy that is essential cellular processes, but may also result in the formation of ROS.

## MitoCheck® Assays

Measure mitochondrial function with Cayman's MitoCheck® assays.

Item No.	Product Name
701040	MitoCheck® Citrate Synthase Activity Assay Kit
700930	MitoCheck® Complex I Activity Assay Kit
700940	MitoCheck® Complex II Activity Assay Kit
700950	MitoCheck® Complex II/III Activity Assay Kit

Item No.	Product Name
700990	MitoCheck® Complex IV Activity Assay Kit
701000	MitoCheck® Complex V Activity Assay Kit
502880	MitoCheck® Extracellular OCR Assay Kit
701010	MitoCheck® Mitochondria (Tissue) Isolation Kit

## BSA-Fatty Acid Complexes

Monitor fatty acid oxidation or similar processes in various cellular metabolic studies.

### Featured Product

#### BSA-Palmitate Reagent Set (5 mM)

Item No. 44698

A BSA-fatty acid complex and control that can be used in fatty acid oxidation assays.

Over 30 BSA-fatty acid complexes available online at [www.caymanchem.com/fatty-acid-complexes](http://www.caymanchem.com/fatty-acid-complexes)



# Assay Kits for Markers of Oxidative Stress

Oxidative stress can be measured indirectly by assessing the associated damage to proteins, lipids, and DNA/RNA. Cayman offers a broad range of assays to detect oxidation of these biomolecules.

## Protein Modification Kits

Item No.	Product Name
10005020	Protein Carbonyl Colorimetric Assay Kit
10010721	S-Glutathionylated Protein Detection Kit
600160	Methionine Sulfoxide Immunoblotting Kit
10006518	S-Nitrosylated Protein Detection Kit (Biotin Switch)
600320	Sulfenylated Protein Cell-Based Detection Kit

## Lipid Peroxidation Assay Kits

Item No.	Product Name
516351	8-Isoprostane ELISA Kit
516360	8-Isoprostane Express ELISA Kit
500431	STAT-8-Isoprostane ELISA Kit
501140	DHN-MA EIA Kit
705002	Lipid Hydroperoxide (LPO) Assay Kit
10009055	TBARS Assay Kit
700870	TBARS (TCA Method) Assay Kit

## Tools to Measure DNA Damage

### DNA/RNA Oxidative Damage (High Sensitivity) ELISA Kit

Item No. 589320

Measure the major oxidative damage markers 8-hydroxy-2'-deoxyguanosine, 8-hydroxyguanosine, and 8-hydroxyguanine in a variety of sample types.

### DNA/RNA Oxidative Damage (Clone 7E6.9) ELISA Kit

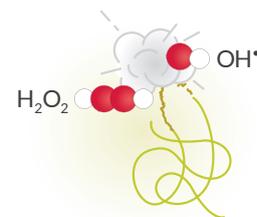
Item No. 501130

Measure the DNA oxidative damage marker 8-hydroxy-2'-deoxyguanosine and the RNA damage marker 8-hydroxyguanosine with equal selectivity and sensitivity.

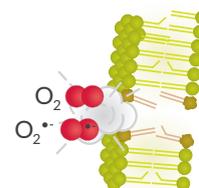
## Protein Normalization Kits

Total protein normalization allows the comparison of relative protein levels between samples.

Item No.	Product Name
760200	Micro BCA Protein Assay Kit
701780	Protein Determination (BCA) Kit



**Protein Modifications.** ROS, RNS, and RSS react with proteins, resulting in modifications to various amino acid residues that can alter the structure and/or function of cellular proteins.



**Lipid Peroxidation.** Lipid peroxidation is most often initiated by ROS like OH•, which target polyunsaturated fatty acids (PUFAs). This initiates a chain reaction that results in the formation of highly reactive and unstable lipid hydroperoxides (LPOs).



**DNA/RNA Damage.** Guanine is the base most prone to oxidation when DNA and RNA are damaged. The repair processes that are initiated to correct this damage result in the excretion of oxidized guanine species into the urine.



## Stressed about Picking an Oxidative Damage Assay?

Get dependable results with reliable assays. Explore trusted methods used in Cayman's oxidative damage assays.

[www.caymanchem.com/oxidativedamage](http://www.caymanchem.com/oxidativedamage)

# Antioxidant Detection & Activity

Enzymatic and cellular antioxidants protect vital cell functions by scavenging reactive species and preventing irreversible injury.

## Glutathione Assay Kits

The ratio of GSH:GSSG is frequently used as a marker of oxidative stress. Determine total, GSH, and/or GSSG levels with this assay kit.

### Featured Product

#### Glutathione Assay Kit

Item No. 703002

- **Assay range:** 0.25-8  $\mu\text{M}$  (GSSG) or 0.5-16  $\mu\text{M}$  (GSH)
- **Detection method:** colorimetric (405-414 nm)

Item No.	Product Name
600360	Glutathione Cell-Based Detection Kit (Blue Fluorescence)

### Featured Product

#### Nrf2 Transcription Factor Assay Kit

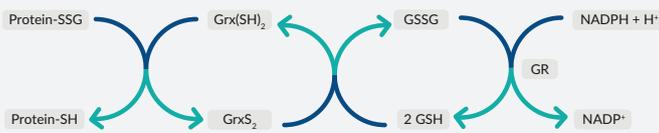
Item No. 600590

Nuclear factor E<sub>2</sub>-related factor 2 (Nrf2) is a transcription factor that induces the expression of several genes encoding cytoprotective proteins, including antioxidative enzymes and anti-inflammatory mediators.

- Sensitive, non-radioactive method of detecting Nrf2 from whole cell lysates
- Detect the dsDNA-bound transcription factor with specific antibodies in an ELISA format

## Glutaredoxin System

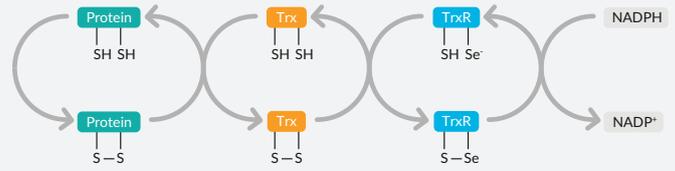
The glutaredoxin system catalyzes the deglutathionylation of glutathionylated proteins and the reduction of protein disulfides.



Item No.	Product Name
500239	Glutaredoxin Fluorometric Activity Assay Kit
703202	Glutathione Reductase Assay Kit

## Thioredoxin System

The thioredoxin system is responsible for the reduction of protein disulfides.



Item No.	Product Name
500228	Thioredoxin Fluorometric Activity Assay Kit
10007892	Thioredoxin Reductase Colorimetric Assay Kit

### New Assay Kit

#### NADPH/NADP Ratio Assay Kit

Item No. 702450

A colorimetric assay for the quantification of NADP<sup>+</sup>, NADPH, and their ratio in cell lysates.

#### Features:

- Simple and convenient assay for quantifying pyridine nucleotides
- Room temperature, endpoint colorimetric 96-well plate method

