

**RANDOX**

# ANTIOXIDANTS



A COMPREHENSIVE RANGE OF ANTIOXIDANT TESTING KITS

# ANTIOXIDANTS

Glutathione Peroxidase | Glutathione Reductase | Superoxide Dismutase Total  
Antioxidant Status | Albumin | Bilirubin | Ferritin | Soluble Transferrin Receptor  
Transferrin | Total Iron Binding Capacity | Uric Acid



**RANDOX**  
REAGENTS

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#### KEY



#### NICHE PRODUCT

When you see this symbol you will know that Randox have one of the only automated biochemistry assays available on the market



#### UNIQUE FEATURE

When you see this symbol you will know that this feature is unique to the Randox product

# BENEFITS OF RANDOX REAGENTS

Randox offers an extensive range of third party diagnostic reagents which are internationally recognised as being of the highest quality; producing accurate and precise results.

We have an extensive test menu of more than 100 assays, covering over 100 disease markers including specific proteins, lipids, therapeutic drug monitoring, drugs of abuse, antioxidants, coagulation, diabetes and veterinary testing.

A wide range of formats and methods are available providing greater flexibility and choice for any laboratory size.

In addition to flexible pack sizes and a comprehensive list of analyser applications, we can also provide dedicated reagent packs (Randox Easy Read and Easy Fit reagents) for a wide range of chemistry analysers providing you with freedom of choice from an independent manufacturer.



## EXPAND YOUR TEST MENU WITHOUT EXPANDING YOUR LAB

There is no need to buy any extra equipment in order to expand your test menu. Our reagents can be programmed onto the majority of the most common biochemistry analysers.



## BRING TESTING IN-HOUSE

With smaller kit sizes and excellent reagent stability (most are stable for 28 days on-board the analyser), you don't have to worry about reagent wastage, allowing testing to be brought in-house.



## EXPAND ROUTINE TESTING

With speciality assays for 195 of the most common clinical chemistry analysers; assays which usually require dedicated equipment (or was previously only available as an ELISA) can now be run on automated biochemistry analysers, allowing your laboratory to expand its routine test menu. For example Glutathione peroxidase, glutathione reductase, and many more.



## REDUCE LABOUR

Reduce your time spent on running tests through liquid ready-to-use reagents, automated methods (compared to the traditional laborious ELISA methods used for some tests such as cystatin C or adiponectin), and our easy-fit options.



## REDUCE COSTS

We can help create cost-savings for your laboratory through excellent reagent stability; by eliminating the need for costly re-runs through the excellent quality of products; and by offering a range of kit sizes (including smaller kit sizes for niche tests to reduce waste).



## REDUCE THE RISK OF ERRORS AND HAVE CONFIDENCE IN PATIENT RESULTS

Our traceability of material and extremely tight manufacturing tolerances ensure uniformity across reagent batches reducing lot-to-lot variability and our assays are validated against gold-standard methods; giving you the confidence that you are sending out the correct patient results.

# Antioxidants

## *A Comprehensive Range of Antioxidant Testing Kits*

### What are antioxidants?

- » An antioxidant is a molecule that prevents oxidation occurring in other molecules
- » Antioxidants can be present as vitamins in food, polyphenols in wine or even enzymes in the body
- » Oxidative stress and inflammation associated with it are the cause of most human illnesses
- » Free radicals produced by oxidation are groups of very reactive molecules that can interrupt important cellular processes
- » Antioxidants function to protect cells against free radical damage

### Why test antioxidants clinically?

Testing of antioxidant levels is beneficial for patients who are concerned that they do not get enough antioxidants in their diet, or who believe that their lifestyle exposes them to greater free radical damage through smoking, heavy exercise, stress or sun exposure.

There is an ever-increasing body of evidence to suggest that oxidative stress is involved in a wide range of disease states, including:

- Rheumatoid arthritis
- Asthma
- Cancer
- Macular degeneration
- Inflammatory Bowel Disease (IBD)
- Neurodegenerative diseases such as Parkinson's and Alzheimer's
- Arthritis
- Diabetes mellitus
- Atherosclerosis
- Chronic fatigue syndrome

Antioxidants are also believed to play an important role in the aging process.

Testing of antioxidants will help to clarify whether a patient's levels are within the recommended range.



# Glutathione Peroxidase

Glutathione peroxidase is a family of enzymes designed to protect the body against oxidative damage.

They are scavenging antioxidants and work by cleansing the free radicals that have formed in the body.

Measuring glutathione peroxidase allows the analysis of selenium levels as glutathione peroxidase correlates well with selenium. Selenium is a very important trace mineral. It supports the immune system and thyroid function and acts as an antioxidant.

## Applications

### Clinical

- Harmful effects of selenium deficiency include an increased risk of recurrent miscarriage, muscular degeneration and male infertility.
- Selenium provides protective effects against tumours, arthritis and cardiovascular dysfunction.
- Excess selenium is toxic, so it is important to have a balanced level.
- Selenium measurement also allows the evaluation of the effectiveness of medicines used for treatment.

### Research

- To determine the therapeutic efficacy and antioxidant potential of newly developed drugs.
- To research the association of glutathione peroxidase with a number of disease states.

### Sports

- Identifying and treating sports professionals at risk of selenium deficiency.

## Randox Glutathione Peroxidase

- **Enzymatic method** enabling sensitive and accurate glutathione peroxidase assessment
- **Excellent sensitivity** of 75 U/l ensuring even low glutathione peroxidase concentrations are detected
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers
- **Glutathione peroxidase (Randox Ransel) control and calibrator available**



# Glutathione Reductase

Glutathione reductase (GR) is an enzyme found in red blood cells. It helps to protect cells against the effects of oxidative stress.

It is an extremely important antioxidant. It is so widespread that it can interact with free radicals in every single cell.

There are two forms:

- Reduced Glutathione
- Oxidised Glutathione

Glutathione reductase works with G-6-PDH to relieve oxidative stress in erythrocytes. This enzyme is specifically responsible for reducing oxidised glutathione molecules and allowing them to act as an antioxidant.

## Applications

### Clinical

- Testing of glutathione reductase deficiency – a rare genetic disease. Clinical manifestations of this deficiency are very similar to that of G-6-PDH deficiency.

### Research

- To research the association of glutathione reductase with a number of disease states.

### Sports

- Can help with the assessment of nutrition (riboflavin status).

## Randox Glutathione Reductase

- **Excellent correlation** coefficient of  $r=0.988$  when compared against other commercially available methods
- **Excellent linearity** of 387U/l, removing the need for sample dilution
- **Working reagent stable for 2 days** when stored at +2 to +8°C
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers



# Superoxide Dismutase

## NP

Superoxide dismutase is one of the body's primary internal antioxidant defences, and plays a critical role in reducing the oxidative stress implicated in atherosclerosis and other life-threatening diseases.

Superoxide dismutase catalyses the dismutation of superoxide into oxygen and hydrogen peroxide.

Superoxide is one of the most dangerous free radicals present in the human body and by destroying it, the superoxide dismutase is performing a vital function.

Superoxide dismutase is involved in lipid peroxidation (the process in which free radicals steal an electron from lipids in the cell membrane, resulting in cellular damage). Most aerobic cells contain the superoxide dismutase enzyme.

Hydrogen peroxide SOD is then linked to glutathione peroxidase, which breaks the peroxide of hydrogen peroxide.

Ferritin is also involved in the free radical neutralisation process, as it is important that iron molecules are bound by ferritin and not free from plasma. Blood iron ions would react with hydrogen peroxide and produce a dangerous hydroxyl product.

Superoxide dismutase is considered part of the natural defense mechanism against oxidative damage as a scavenger for the toxic superoxide radical.

## Applications

### Clinical

- Superoxide dismutase deficiency is associated with diseases such as the familial dominant form of amyotrophic lateral sclerosis (ALS) and Alzheimer's disease
- Superoxide dismutase can be used to treat various ailments including arthritis, burns and inflammatory diseases. Its measurement can help to evaluate the efficiency of treatment targeting superoxide dismutase levels.

### Research

- To determine the therapeutic efficacy and antioxidant potential of newly developed drugs.
- To research the association of superoxide dismutase with a number of disease states.

### Sports

- The superoxide dismutase test allows for research into the effects of sport on free radical damage and the protective effects of SOD.

## Randox Superoxide Dismutase

- **Lyophilised reagents** for enhanced stability
- **Standard supplied with kit** simplifying the ordering process
- **Multiple analytical uses** including: clinical, veterinary, sports, cosmetics and pharma
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers
- **Colorimetric method**
- **Superoxide dismutase (Randox Ransod) control** available





# Total Antioxidant Status (TAS)

TAS is the measurement of non-quantitative antioxidant function. Considering the total level of antioxidants in the human body, provides a good overall view of antioxidants in a single measurement and can provide more relevant information to individually measure components.

Total antioxidant measurement considers the cumulative effect of all antioxidants present.

Measuring TAS takes into account reactions between antioxidants and contributions from unknown factors or components that are not normally recognised as antioxidants from the diet.

## Applications

### Clinical

- Measurement of the combined non-enzymatic antioxidant capacity of biological fluids and other samples provides an indication of the overall capability to counteract reactive oxygen species (ROS), resist oxidative damage and combat oxidative stress-related diseases.
- TAS has been associated with several disease states such as cancer, heart disease, rheumatoid arthritis, diabetes and retinopathy. Therefore its measurement can help to evaluate the effectiveness of treatment targeting TAS levels.

### Research

- To research the association of TAS with a number of disease states.

### Sports

- To measure the effects of sport on levels of TAS.

## Randox Total Antioxidant Status

- **Suitable for automation** as other commercially available products are based on ELISA technology which does not offer the same level of convenience and efficiency as the Randox TAS assay
- **Standard supplied with kit** simplifying the ordering process
- **Excellent measuring range** of 0.21-2.94 mmol/l
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers
- **Colorimetric method**
- **Total antioxidant status control** available

## ASSOCIATED PRODUCTS BY RANDOX

### Albumin

Albumin is the most abundant protein in serum representing 55-65% of the total protein. Its main biological functions are to maintain the water balance in serum and plasma and to transport and store a wide variety of ligands e.g. fatty acids, calcium, bilirubin and hormones such as thyroxine. Recent evidence suggests albumin may exert antioxidant properties by functioning as a serum peroxidase in the presence of reduced glutathione. Low albumin levels (Hypoalbuminaemia) have been associated with liver disease, kidney disease, intestinal disease, cardiovascular disease and cancer.

### Randox Albumin

- BCG method
- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **Stable for 3 months** when stored at +15 to +25°C
- **Measuring range** of 1.58-87.2 g/l
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers
- **Complementary controls and calibrators available**

### Bilirubin

Bilirubin is formed by the breakdown of haemoglobin in the spleen, liver and bone marrow. It can be conjugated with glucuronic acid or unconjugated (albumin bound). An increase in bilirubin concentration in the serum or tissue is called jaundice and can occur in toxic or infectious diseases of the liver. High levels of conjugated or direct bilirubin indicate that bile is not being properly excreted; indicating an obstruction may be present in the bile duct or gall bladder. High levels of unconjugated bilirubin indicate that too much haemoglobin is being destroyed or that the liver is not actively treating the haemoglobin it is receiving. Bilirubin can be referred to as a scavenging antioxidant and acts by removing harmful peroxy radicals from the body.

### Randox Bilirubin

- **UF Superior Vanadate Oxidation methodology** as this method does not suffer from interference from non-conjugated bilirubin, unlike the diazo-based methods
- **Modified Jendrassik method also available**
- **Limited interference** from Haemoglobin and Lipids
- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **No pre-step required** as other commercially available bilirubin assays may involve a pre-step, requiring two assay components to be mixed together. The Randox Vanadate Oxidation method eliminates this step, increasing testing efficiency
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers
- **Stable up to expiry** when stored at +2°C to +8°C
- **Complementary controls and calibrators available**

## Ferritin

Ferritin is a protein which contains iron and acts as the primary source of stored cellular iron. The basic isoforms are present in the liver, spleen and bone marrow and are concerned mainly with the long-term storage of iron while the acidic isoforms are found in the placenta, tumour tissues and myocardium. Ferritin contributes to the body's antioxidant defence by sequestering iron and preventing it from catalyzing the production of free radicals in the cell.

## Soluble Transferrin Receptor (sTfR)

Transferrin transports iron around the body, donating it to bodily cells by interacting with a specific membrane receptor, the transferrin receptor (TfR). A soluble form of the TfR (sTfR) has been identified in animal and human serum, circulating freely in the blood.

sTfR is a marker of iron status. In iron deficiency anaemia, sTfR levels are significantly increased, however, remain normal in the anaemia of inflammation. As such, sTfR measurement is useful in the differential diagnosis of microcytic anaemia.

## Transferrin

Transferrin is a protein responsible for the binding to iron and transporting it around the body. Plasma levels of transferrin are regulated by the availability of iron and increase when plasma levels of iron are low. Transferrin levels are also known to increase during pregnancy and are often associated with a range of conditions including anaemia, iron deficiency, inflammation, malignancy, liver disease, malnutrition and protein loss. Like ferritin, transferrin can be described as a preventative antioxidant and acts by binding iron in a redox inactive form. This process is extremely important as free iron is capable of stimulating the production of harmful free radicals.

## Radox Ferritin

- **Latex enhanced immunoturbidimetric**
- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **Stable to expiry date** when stored at +2 to +8°C
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers
- **Measuring range** of 5.78–434 ng/ml

## Radox Soluble Transferrin Receptor

- **Excellent correlation** coefficient of  $r=0.977$  when compared against other commercially available methods
- **Excellent measuring range** of 0.5 - 11.77mg/L, comfortably detecting levels outside of the normal healthy range
- **Liquid ready to-use-reagents** for convenience and ease of use
- **Latex enhanced immunoturbidimetric**
- **Stable to expiry** when stored at +2 to +8°C

## Radox Transferrin

- **Immunoturbidimetric method**
- **Liquid ready-to-use reagents** for convenience and ease of use
- **Stable to expiry date** when stored at +2 to +8°C
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers
- **Measuring range** of 21–550 mg/dl



## **Total Iron Binding Capacity (TIBC)**

Total Iron Binding Capacity (TIBC) measures the blood's capacity to bind iron with transferrin and is therefore an indirect measurement of transferrin. As previously mentioned, iron is capable of stimulating the production of harmful free radicals.

## **Uric Acid**

Uric acid measurement is used in the diagnosis and treatment of numerous renal and metabolic disorders including renal failure, gout, leukaemia and psoriasis. Uric acid is a potent antioxidant contributing to around half the antioxidant capacity of blood plasma. It is a scavenging antioxidant that acts by inactivating free radicals such as HO and HOCl.

### **Randox TIBC**

- **Colorimetric method**
- **Liquid ready-to-use reagents** for convenience and ease of use
- **Stable to expiry date** when stored at +2 to +8°C
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers
- **Measuring range** of 57.7-672 µg/dl

### **Randox Uric Acid**

- **Enzymatic colorimetric method**
- **Liquid and lyophilised reagents available** offering choice and flexibility
- **Standard included in some kits** simplifying the ordering process
- **Stable to expiry date** when stored unopened protected from light
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers
- **Measuring range** of 20.8-1375 µmol/l

## ORDERING INFORMATION

Description	Method	Size	Cat. No.
Glutathione Peroxidase (Ransel)	Enzymatic	8 × 6.5ml	RS504
Glutathione Peroxidase (Ransel)	Enzymatic	8 × 10ml	RS505
Glutathione Reductase	UV	R1 5 × 5ml, R2 5 × 3ml	GR2368
Superoxide Dismutase (Ransod)	Colorimetric	5 × 20ml (S)	SD125
Total Antioxidant Status (TAS)	Colorimetric	5 × 10ml (S)	NX2332
Albumin	BCG	6 × 100ml (S) ♦	AB362
Albumin	BCG	9 × 51ml ♦	AB3800
Albumin	BCG	4 × 68ml ♦	AB8000
Albumin	BCG	4 × 20ml ♦	AB8301
Bilirubin (Direct)	Jendrassik	2 × 250ml ♦	BR2362
Bilirubin (Direct)	Jendrassik	R1 2 × 30ml, R2 8 × 4ml ♦	BR3807
Bilirubin (Direct)	Jendrassik	R1 4 × 16ml, R2 8 × 4ml ♦	BR8035
Bilirubin (Direct)	Vanadate Oxidation	R1 4 × 14ml, R2 4 × 6ml ♦	BR9765
Bilirubin (Direct)	Vanadate Oxidation	R1 4 × 20ml, R2 4 × 8ml ♦	BR4060
Bilirubin (Direct)	Vanadate Oxidation	R1 4 × 52.2ml, R2 4 × 20ml ♦	BR8133
Bilirubin (Direct)	Vanadate Oxidation	R1 4 × 20ml, R2 4 × 8ml ♦	BR8376
Bilirubin (Total)	Jendrassik	2 × 250ml ♦	BR2361
Bilirubin (Total)	Vanadate Oxidation	R1 4 × 20ml, R2 4 × 8ml ♦	BR8308
Bilirubin (Total)	Vanadate Oxidation	R1 4 × 68ml, R2 4 × 25ml ♦	BR9766
Bilirubin (Total)	Vanadate Oxidation	R1 4 × 20ml, R2 4 × 8ml ♦	BR4061
Bilirubin (Total)	Vanadate Oxidation	R1 4 × 52.2ml, R2 4 × 20ml ♦	BR8132
Bilirubin (Total)	Vanadate Oxidation	R1 4 × 20ml, R2 4 × 8ml ♦	BR8377
Bilirubin (Total & Direct)	Vanadate Oxidation	1 × 225ml ♦	BR4111
Ferritin	LEI	R1 1 × 40ml, R2 1 × 20ml ♦	FN3452
Ferritin	LEI	R1 4 × 40ml, R2 4 × 20ml ♦	FN3453
Ferritin	LEI	R1 3 × 20ml, R2 3 × 11ml ♦	FN3888
Ferritin	LEI	R1 4 × 16.2ml, R2 4 × 10.2ml ♦	FN8037
Soluble Transferrin Receptor (sTfR)	Latex Enhanced Immunoturbidimetric	R1 1 × 9ml, R2 1 × 5.8ml ♦	TF10159
Transferrin	Immunoturbidimetric	R1 6 × 20ml, R2 3 × 14ml ♦	TF3831
Total Iron Binding Capacity	Colorimetric	R1 4 × 9ml, R2 4 × 4ml ♦	TI4064
Total Iron Binding Capacity	Colorimetric	R1 4 × 8.7ml, R2 4 × 4.9ml ♦	TI8065
Total Iron Binding Capacity	Colorimetric	R1 4 × 10ml, R2 4 × 5.1ml ♦	TI8375
Uric Acid	Enzymatic Colorimetric	6 × 15ml (S)	UA230
Uric Acid	Enzymatic Colorimetric	R1 6 × 51ml, R2 4 × 20ml ♦	UA3824
Uric Acid	Enzymatic Colorimetric	9 × 51ml ♦	UA3870
Uric Acid	Enzymatic Colorimetric	R1 6 × 56ml, R2 6 × 20ml ♦	UA8069
Uric Acid	Enzymatic Colorimetric	R1 4 × 20ml, R2 4 × 7ml ♦	UA8333

### KEY

- ♦ Indicates liquid option
- (C) Indicates calibrator included in kit
- (S) Indicates standard included in kit, and is for manual and semi-automated use only
- LEI Latex Enhanced Immunoturbidimetric

To place an order, please contact [order.entry@randox.com](mailto:order.entry@randox.com)

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# RANDOX - A GLOBAL DIAGNOSTIC SOLUTIONS PROVIDER

Randox has been supplying laboratories worldwide with revolutionary diagnostic solutions for over 40 years. Our experience and expertise allow us to create a leading product portfolio of high quality diagnostic tools which offer reliable and rapid diagnosis. We believe that by providing laboratories with the right tools, we can improve health care worldwide.



## RX SERIES

Renowned for quality and reliability, the RX series combines robust hardware and intuitive software with the world leading RX series test menu comprising an extensive range of high quality reagents including routine chemistries, specific proteins, lipids, therapeutic drugs, drugs of abuse, antioxidants and diabetes testing. The RX series offers excellence in patient care delivering unrivalled precision and accuracy for results you can trust, guaranteeing real cost savings through consolidation of routine and specialised tests onto one single platform.



## INTERNAL QUALITY CONTROL

Acusera third party quality controls are made using the highest quality material of human origin, ensuring they react like a real patient sample. With more than 390 analytes available across the Acusera range we can uniquely reduce the number of controls required while reducing costs and time. Our product range includes clinical chemistry, immunoassay, urine, immunology and more. Qnostics molecular controls for infectious disease testing are designed to meet the demand of today's molecular diagnostics laboratory while effectively monitoring the entire testing process. Our whole pathogen molecular controls comprise hundreds of characterised viral, bacterial and fungal targets.



## EXTERNAL QUALITY CONTROL

RIQAS is the world's largest international EQA scheme with more than 45,000 participants worldwide. 33 comprehensive, yet flexible programmes cover a wide range of clinical diagnostic testing including chemistry, immunoassay, cardiac, urine, serology and more. Our programmes benefit from a wide range of concentrations, frequent reporting, rapid feedback and user-friendly reports. The QCMD range of molecular infectious disease EQA programmes feature a whole pathogen matrix ensuring a true test of patient sample analysis. With access to over 90 programmes including blood borne viruses, respiratory diseases, multi-pathogen infections and more, there is something for every laboratory.



## EVIDENCE SERIES

In 2002, Randox invented the world's first, Biochip Array Technology, offering highly specific tests, coupled to the highly sensitive chemiluminescent detection, providing quantitative results instantly changing the landscape of diagnostic testing forever. The Randox Evidence Series of multi-analyte immunoanalyser's provide an unrivalled increase in patient information per sample offering diagnostic, prognostic and predictive solutions across a variety of disease areas with a highly advanced clinical and toxicology immunoassay test menu including cardiac, diabetes, drugs of abuse, metabolic and renal markers.

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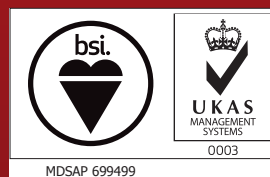
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**RANDOX**  
REAGENTS



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