RANDOX

# SUPERIOR PERFORMANCE & UNIQUE TESTS

DESIGNED TO MEET THE NEEDS OF YOUR LABORATORY


# HIGH PERFORMANCE & UNIQUE TESTS

Cardiology and Lipids | Diabetes | Renal Function | Antioxidants | Clinical Chemistry

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Key:

UF **UNIQUE FEATURE**

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

NP **NICHE PRODUCT**

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

# 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 over 100 assays, covering over 100 disease markers including: antioxidants, diabetes, cardiology & lipid testing, specific proteins, therapeutic drug monitoring 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 regents) 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.

## Expand routine testing

With speciality assays for 195 of the most common clinical chemistry analysers; assays which usually require dedicated equipment can now be run on automated biochemistry analysers; allowing your laboratory to expand its routine test menu.

## 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).

## Bring testing in-house

With smaller kit sizes and excellent reagent stability you don't have to worry about reagent wastage, allowing testing to be brought in - house.

## Reduce labour

Reduce your time spent on running tests through liquid ready-to-use reagents, automated methods and our easy - fit options.

## 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. Giving you the confidence that you are sending out the correct patient results.

# CARDIOLOGY & LIPIDS

Lipoprotein (a) | Small Dense LDL Cholesterol (sdLDL - C) | Homocysteine

Apolipoprotein C - II | Apolipoprotein C - III | Apolipoprotein E

## Lipoprotein(a) (Lp(a))

Elevated levels of Lipoprotein(a) (Lp(a)), are considered to be both a causal risk factor and independent genetic marker of **atherosclerotic disorders.** The major challenge associated with Lp(a) measurement is the size variation of the apo(a) molecule within Lp(a). Dependent upon the size of the apo(a) in the assay calibrator, many assays under or overestimate apo(a) size in the patient sample. Numerous commercially available products suffer from apo(a) size related bias, resulting in an over estimation of Lp(a) in samples with large apo(a) molecules and an under estimation in samples with small apo(a) molecules. The antibody used in the Randox method detects the complete Lp(a) molecule providing accurate and consistent results. This was proven by the IFCC who developed a gold standard ELISA reference assay and compared 22 commercially available tests. The Randox Lp(a) method displayed the least (minimal) amount of apo(a) size related bias, proving it to be a superior offering.

## Ordering Information

| | | |
|---|---|---|
| Cat. No: | LP2757 ♦ | R1 1 x 30ml |
| | | R2 1 x 15ml |
| | LP3403 ♦ | R1 1 x 10ml |
| | | R2 1 x 6ml |

♦ Indicates liquid option

## Randox Lp(a)

- UF The Randox Lp(a) assay is one of the only methodologies on the market that detects the non - variable part of the Lp(a) molecule and therefore suffers minimal size related bias providing more accurate and consistent results.
- UF The Randox Lp(a) kit is standardised to the WHO/IFCC reference material SRM 2B and is closest in terms of agreement to the ELISA reference method
- UF Five point calibrator with accuracy-based assigned target values is provided which accurately reflects the heterogeneity of isoforms present in the general population
- Measuring units available in nmol/L upon request
- Highly sensitive and specific method for Lp(a) detection in serum and plasma
- Applications available detailing instrument - specific settings for a wide range of clinical chemistry analysers
- Liquid ready-to-use reagents for convenience and ease-of-use
- Lp(a) controls and calibrator available offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

## Small - dense LDL (Low Density Lipoprotein) Cholesterol (sdLDL - C)

Small - dense LDL Cholesterol (sdLDL - C) is a subtype of LDL cholesterol. All LDL transports triglycerides and cholesterol to bodily tissues but their atherogenicity varies according to size. Smaller particles such as sdLDL - C can permeate the inner arterial wall more readily and are more susceptible to oxidation, making sdLDL - C particularly atherogenic. Research has found that individuals with a predominance of sdLDL - C have **a three - fold increased risk of myocardial infarction**, making sdLDL - C measurement extremely valuable. sdLDL - C is a valuable screening tool of Cardiovascular Disease risk.

## Ordering Information

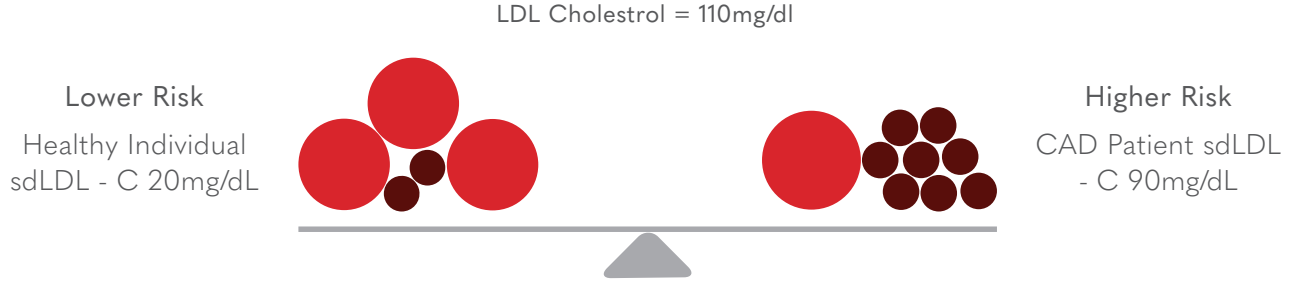
| | | |
|---|---|---|
| Cat. No: | 562616 ♦ | R1 1 x 19.8ml |
| | | R2 1 x 8.6ml |
| | 562760 (U) ♦ | R1 1 x 18ml |
| | | R2 1 x 7ml |
| | 562791*(U) ♦ | R1 5 x 200ml |
| | 562807*(U) ♦ | R2 2 x 200ml |

♦ Indicates liquid option
(U) indicates for use in the USA only!
(*) indicates that both kits must be purchased together!

## Randox sdLDL - C

- **Rapid analysis** as results can be produced in as little as ten minutes, facilitating faster patient diagnosis and treatment plan implementation
- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **Applications available** detailing instrument - specific settings for a wide range of analysers
- **Clearance method**
- **Dedicated sdLDL - C control and calibrator available** offering a complete testing package

Fig 1. Size matters: the true weight of risk in lipid profiling[1]




For specific catalogue numbers, please refer to IFU for full performance details

## Apolipoprotein C - II

NP

Apolipoprotein C - II (Apo C - II) is an amino acid protein synthesised mainly in the liver and to a lesser extent in the intestine. Apo C-II acts as a co - factor for lipoprotein lipase; an enzyme that hydrolyses triglycerides in chylomicrons and VLDL - C. Patients have been identified with **hypertriglyceridemia** due to a deficiency in Apo C - II which leads to an increased risk of the patient developing **coronary artery disease**.

Additional disease states associated with Apo C - II deficiency include **chylomicronemia, xanthomas and recurrent pancreatitis.**

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | LP3866 ♦ | R1 2 x 11ml |
| | | R2 2 x 5ml |

♦ Indicates liquid option

### Randox Apolipoprotein C - II

- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **Excellent sensitivity of 1.48mg/dl**, ensuring depleted levels of Apo C - II are detected
- **Limited interference** from Bilirubin, Haemoglobin, Intralipid® and Triglycerides for truly accurate results
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- Immunoturbidimetric method
- **Dedicated Apolipoprotein controls and calibrator available** offering a complete testing package

## Apolipoprotein C - III

NP

Apolipoprotein C - III (Apo C - III) is an amino acid protein which circulates in plasma in association with triglyceride rich lipoproteins (chylomicrons, VLDL - C and ILDL-C) and HDL-C. Apo C - III modulates the uptake of triglyceride - rich lipoproteins by the LDL receptor related protein through the inhibition of lipoprotein lipase. Elevated levels of Apo C - III are associated with **both primary and secondary hypertriglyceridemia.**

Genetically determined, **Apo C - III deficiency in humans can increase the rate of triglyceride clearance from plasma by up to seven fold.** However, elevated Apo C - III levels can be detected in many pathological conditions including: **type 2 diabetes, hyperbilirubinemia, kidney malfunction and decreased thyroid function.** Factors that can influence Apo C - III levels include: gender, age, menopause and genetic polymorphisms in the Apo C - III gene.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | LP3865 ♦ | R1 2 x 11ml |
| | | R2 2 x 5ml |

♦ Indicates liquid option

### Randox Apolipoprotein C - III

- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **Excellent linearity of 21.7mg/dl** for the comfortable detection of clinically important results
- **Limited interference** from Bilirubin, Haemoglobin, Intralipid® and Triglycerides for truly accurate results
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- Immunoturbidimetric method
- **Apolipoprotein controls and calibrator available** offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

## Apolipoprotein E

NP

Apolipoprotein E (Apo E) is an amino acid protein synthesised mainly in the liver but also in the brain, spleen, lungs, adrenals, ovaries, kidneys, muscle cells and in macrophages. The polymorphism of Apo E has been implicated in several diseases including **cardiovascular disease and neurodegenerative diseases such as Alzheimer's.**

Apo E deficiency causes high serum cholesterol and triglyceride levels and leads to **premature atherosclerosis**. A number of factors can affect Apo E concentrations including: genetic polymorphisms, oral contraceptive intake, puberty, BMI and age.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | LP3864 ♦ | R1 2 x 11ml |
| | | R2 2 x 5ml |

♦ Indicates liquid option

### Randox Apolipoprotein E

- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **Excellent measuring range of 1.04 - 12.3mg/dl**, for the comfortable detection of clinically important results
- **Limited interference** from Bilirubin, Haemoglobin, Intralipid® and Triglycerides for truly accurate results
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Immunoturbidimetric method**
- **Apolipoprotein control and calibrator available** offering a complete testing package

## Homocysteine

Homocysteine is a thiol - containing amino acid produced by the intracellular demethylation of Methionine. Homocysteine is an independent risk factor for cardiovascular disease. High levels of Homocysteine (hyperhomocysteinemia) leads to artery endothelial cell damage and reduced vessel flexibility. Research suggests the negative effect of Hyperhomocysteinemia on the artery cell wall may increase an individual's risk of developing atherosclerosis. Elevated levels of Homocysteine can be associated with various disease states including: **Cardiovascular Disease, Diabetes, Dementia, Osteoporosis, and physical performance and complications during pregnancy**; making homocysteine an essential addition to a laboratory's testing panel.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | HY4036 (C) ♦ | R1 2 x 21.7ml |
| | | R2 2 x 4.6ml |
| | | CAL 2 x 1 x 3ml |

♦ Indicates liquid option
(C) indicates calibrator included in kit

### Randox Homocysteine

UF **Limited interference** from Bilirubin, Haemoglobin, Triglycerides and Intralipid®, producing more accurate and precise results

UF **Two - reagent format** for convenience and ease-of-use

- **Calibrator provided with kit** simplifying the ordering process
- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **Wide measuring range of 1.7 - 47.9µmol/l** enabling the comfortable detection of clinically important results
- **Enzymatic method**
- **Tri-level cardiac control available** offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

# DIABETES

Fructosamine | Non - Esterified Fatty Acids (NEFA) | D - 3 - Hydroxybutyrate (Ranbut)

## Fructosamine (Glycated Serum Protein)

Fructosamine is a mid - term indicator of diabetic control as it can provide information on a person's average blood glucose levels over the preceding 14 - 21 days. After commencing therapy, fructosamine level decrease earlier (within a week) than HbA1c (after 4 - 8 weeks) and so, it is often used to evaluate the effectiveness of **medication changes** and to monitor the **treatment of gestational diabetes**. Fructosamine is also particularly useful in situations where HbA1c cannot be reliably measured when individuals have, for example: **haemolytic anaemia, thalassemia or genetic haemoglobin variants.**

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | FR3133 ♦ | R1 5 x 25ml |
| | | R2 5 x 6.3ml |
| | FR4030 ♦ | R1 4 x 19.8ml |
| | | R2 4 x 6.9ml |

♦ Indicates liquid option

### Randox Fructosamine (Glycated Serum Protein)

UF **Superior performance enzymatic method** which offers improved specificity and reliability compared to conventional NBT - based methods. The Randox enzymatic method does not suffer from non - specific interferences unlike other commercially available fructosamine assays

- **Liquid ready-to-use reagents** convenience and ease-of-use
- **Limited interference** from Bilirubin, Glucose, Haemoglobin, Intralipid® and Triglycerides ensuring truly accurate results are produced
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Dedicated Fructosamine controls and calibrator available** offering a complete testing package

## Non - Esterified Fatty Acids (NEFA) NP

Non - Esterified Fatty Acids (NEFA) are molecules released from triglycerides by the action of the enzyme lipase and are transported in the blood bound to albumin. NEFA are major contributers to the body's energy supply despite representing a small proportion of the body's fat percentage. Measurement of NEFA is particularly important in **diabetes where insulin deficiency results in the metabolism of fat**. Levels are also frequently increased in obese patients. NEFA exerts an inflammatory effect on localised tissues. Consequently NEFA can contribute to the development of atherosclerosis.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | FA115 (C) | R1a 1 x 70ml |
| | | R1b 3 x 10ml |
| | | R2a 3 x 20ml |
| | | R2b 3 x 20ml |
| | | R2c 3 x 20ml |
| | | CAL 1 x 5.5ml |

(C) indicates calibrator included in kit

### Randox NEFA

- **Excellent precision** of <5% CV
- **Standard supplied with kit** simplifying the ordering process
- **Excellent measuring range of 0.072 - 2.24mmol/l** for the comfortable detection of clinically important results
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Colorimetric method**
- **Control available** offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

## Randox D-3-Hydroxybutyrate (Ranbut)

D - 3 - Hydroxybutyrate is the most sensitive ketone for the **diagnosis of ketosis,** in particular **diabetic ketoacidosis**. Ketosis, a metabolic process, occurs when the body switches from glucose to predominantly fat metabolism for energy production when carbohydrate availability reaches low levels. Metabolism of fatty acids in the liver results in the production of 3 ketones: acetone, acetoacetate and D - 3 - Hydroxybutyrate. Levels of ketone bodies in the blood are elevated (ketosis) when synthesis exceeds breakdown.

## Ordering Information

| | | |
|---|---|---|
| Cat. No: | RB1007 (S) | R1a 1 x 105ml |
| | | R1 10 x 10ml |
| | | CAL 1 x 5.5ml |
| | RB1008 (S) | R1a 10 x 50ml |
| | | R2b 10 x 50ml |
| | | CAL 1 x 5.5ml |

♦ Indicates liquid option
(S) Indicates standard included in kit, and is for manual and semi-automated use only

## Randox D-3-Hydroxybutyrate (Ranbut)

- **Superior methodology** when compared to other commercially available ketone detection tests. The nitroprusside method used in semi - quantitative dipstick tests only detects acetone and acetoacetate, not D-3 Hydroxybutyrate. Measuring only D-3-Hydroxybutyrate for ketone analysis provides more accurate, comparable and sensitive results
- **Wide measuring range** for the comfortable detection of clinically important results
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Suitable for use in serum** reducing the risk of false negatives
- **Enzymatic method**
- **Controls and calibrator available** offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

# RENAL FUNCTION

Liquid Enzymatic Creatinine | Microalbumin

## Liquid Enzymatic Creatinine

Creatinine clearance in the kidneys provides a measure of the Glomerular Filtration Rate (GFR) and is the standard marker for renal function. The enzymatic method of Creatinine measurement displays several advantages over the JAFFE method: highly specific, no interferences from endogenous creatinine as it is not involved in the pathway and eliminates the requirement for urea determination. Systemic errors from JAFFE creatinine provides unreliable renal function estimates, resulting in the risk of incorrect drug dosage adjustments, misclassification in Chronic Kidney Disease staging and incomparability of patient data.

## Ordering Information

| | | |
|---|---|---|
| Cat. No: | CR2336 (C) | R1a 4 x 50ml |
| | | R1b 4 x 50ml |
| | | R2 4 x 10ml |
| | | CAL 1 x 5.5ml |
| | CR2337 (C) | R1a 4 x 100ml |
| | | R1b 4 x 100ml |
| | | R2 4 x 20ml |
| | | CAL 1 x 5.5ml |
| | CR8122 ♦ | R1 4 x 65ml |
| | | R2 4 x 32.3ml |
| | CR4037 ♦ | R1 4 x 50ml |
| | | R2 4 x 19.5ml |
| | CR8317 ♦ | R1 4 x 20ml |
| | | R2 4 x 9.5ml |

♦ Indicates liquid option

(C) Indicates standard included in kit, and is for manual and semi-automated use only

## Randox Liquid Enzymatic Creatinine

UF **Enzymatic method** offering superior specificity when compared to traditional Jaffe creatinine assays

- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **Limited interference** from Bilirubin, Haemoglobin, Intralipid® and Triglycerides, for truly accurate results and ensuring it is suitable for use with paediatric samples
- **Extensive measuring range** for the comfortable detection of clinically important results
- **No sample blank required**
- **Controls and calibrator available** offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

## Microalbumin

The Microalbumin assay detects very low levels of albumin in urine. The detection of albumin in urine can be an **indicator of kidney injury** which can result in irreversible damage if left untreated. Low albumin concentrations in urine (20 - 200mg/day) is the **earliest marker of renal damage** and therefore enables preventative measures to be taken. Microalbumin testing can identify individuals with **diabetic nephropathy** approximately 5 - 10 years earlier than proteinuria tests helping reduce the incidence of end stage renal disease.

## Ordering Information

| | | |
|---|---|---|
| Cat. No: | MA2426 (S) ♦ | R1 1 x 60ml |
| | | R2 1 x 7ml |
| | | CAL 6 x 1 x 2ml |
| | MA3828 ♦ | R1 6 x 20ml |
| | | R2 3 x 8ml |
| | MA8056 ♦ | R1 2 x 20ml |
| | | R2 2 x 6.6ml |
| | MA8325 ♦ | R1 1 x 20ml |
| | | R2 1 x 4.6ml |

♦ Indicates liquid option
(S) Indicates standard included in kit

## Randox Microalbumin

(UF) **Standard supplied with kit** simplifying the ordering process

- **Immunoturbidimetric method** enabling sensitive and accurate albumin assessment
- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **Excellent sensitivity** ensuring even low albumin concentrations are detected
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Dedicated Microalbumin controls and calibrators available** offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

# ANTIOXIDANTS

Total Antioxidant Status (TAS) | Glutathione Peroxidase (Randox Ransel) | Glutathione Reductase | Soluble Transferrin Receptor (sTfR) | Superoxide Dismutase (Randox Ransod)

## Total Antioxidant Status (TAS) NP

The antioxidant defence system has many components. A deficiency in any of these components can cause a reduction in the overall antioxidant status of an individual. Reduction in Total Antioxidant Status (TAS) has been implicated in a number of disease states including: **heart disease, rheumatoid arthritis, diabetes and cancer.** TAS analysis is also useful in relation to retinopathy and age - related conditions. These can be monitored to promote supplementation and disease prevention.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | NX2332 (S) | R1 1 x 100ml |
| | | R2 5 x 10ml |
| | | R3 2 x 5ml |
| | | CAL 5 x 1ml |

(S) Indicates standard included in kit, and is for manual and semi-automated use only

### Randox TAS

- **Suitable for automation** whereas 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 - 2.50mmol/l** enabling the comfortable detection of clinically important results
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Colorimetric method**
- **Dedicated TAS control available** offering a complete testing package

## Glutathione Peroxidase (Ransel) NP

Ransel measures Glutathione Peroxidase which has **a direct correlation with selenium levels.** Selenium is an essential trace element involved in the aetiology of a number of diseases. At normal concentrations selenium has a protective effect against several disease states however, this protection is lost at lower concentrations. Conversely selenium can be toxic at high concentrations, therefore, it is important to monitor selenium levels to ensure they are kept within the normal range. The risk factors associated with abnormal selenium concentrations include: age, diet, smoking, stress, autoimmune diseases and chemotherapy.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | RS504 | R1a 8 x 6.5ml |
| | | R1b 1 x 70ml |
| | | R2 1 x 1ml |
| | | R3 2 x 200ml |
| | RS505 | R1a 8 x 10ml |
| | | R1b 1 x 100ml |
| | | R2 1 x 1ml |
| | | R3 2 x 200ml |

### Randox Glutathione Peroxidase (Ransel)

- **Enzymatic method** enabling sensitive and accurate Glutathione Peroxidase assessment
- **Excellent sensitivity** for the comfortable detection of clinically important results
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Dedicated Ransel controls and calibrator available** offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

## Glutathione Reductase

NP

Glutathione Reductase is required for the regeneration of reduced glutathione which is important for normal cellular metabolism. This enzyme is often discussed in association with glutathione peroxidase, which requires reduced glutathione for activation. Glutathione reductase is responsible for maintaining levels of reduced glutathione which has many important intracellular functions within bodily cells. Glutathione plays a role in protein folding and the maintenance of reduced pools of vitamin C and E. Depleted levels of glutathione reductase can lead to **haemolysis.**

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | GR2368 | R1a 1 x 70ml |
| | | R1b 5 x 5ml |
| | | R2 5 x 3ml |

### Randox Glutathione Reductase

- **Lyophilised reagents** for enhanced stability
- **Excellent measuring range of 9.69 - 387U/l** enabling the comfortable detection of clinically important results
- **Suitable for use with a variety of sample types** including: serum, plasma and erythrocytes
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **UV method**
- **Dedicated Glutathione Reductase control and calibrator available** offering a complete testing package

## Soluble Transferrin Receptor (sTfR)

NP

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 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**.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | TF10159 ♦ | R1 1 x 9ml |
| | | R2 1 x 5.8ml |

♦ Indicates liquid option

### Randox sTfR

- **Excellent correlation coefficient of r=0.977** when compared against other commercially available methods
- **Excellent measuring range of 0.5 - 11.77mg/L,** for the comfortable detection of clinically important results
- **Liquid ready-to-use reagent** for convenience and ease-of-use
- **Latex enhanced immunoturbidimetric method**
- **Stable to expiry** when stored at +2°C to +8°C
- **Dedicated sTfR control and calibrator available** offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

## Randox Superoxide Dismutase (Ransod)

Superoxide Dismutase (SOD) catalyses the dismutation of superoxide into oxygen and hydrogen peroxide, consequently providing protection against superoxide which is one of the most common free radicals in the body. The enzyme acts by repairing and/or reducing the amount of damage done to cells. Ransod (Randox Superoxide Dismutase) can be used in the diagnosis of diseases associated with abnormal SOD levels including, neurological disorders such as **Amyotrophic Lateral Sclerosis (ALS).** SOD can also be used to treat various ailments including **arthritis, burns and inflammatory diseases.** Research has shown SOD levels to decrease and levels of free radicals to increase in the body with age, suggesting SOD plays a major role in the aging process.

## Ordering Information

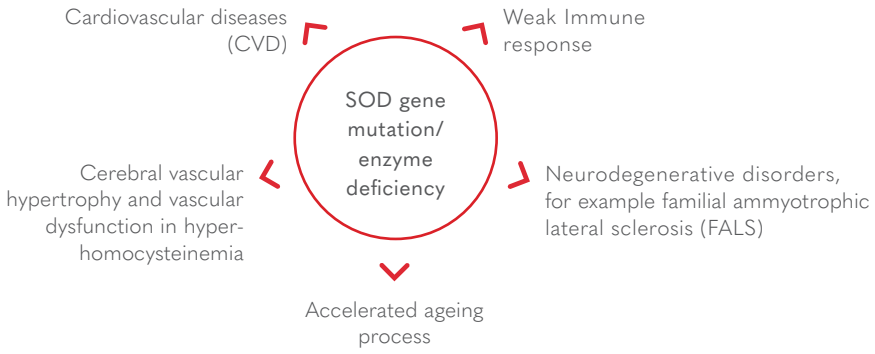
| | | |
|---|---|---|
| Cat. No: | SD125 (S) | R1a 5 x 20ml |
| | | R1b 1 x 105ml |
| | | R2 3 x 10ml |
| | | CAL 5 x 10ml |

(S) Indicates standard included in kit

## Randox Superoxide Dismutase (Ransod)

- **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
- **Dedicated superoxide dismutase (Ransod) control available** offering a complete testing package

Fig 4. Pathological effects associated with SOD gene mutation or SOD deficiency[4]




For specific catalogue numbers, please refer to IFU for full performance details

# CLINICAL CHEMISTRY

Aldolase | Cystatin C | Vanadate Oxidation Bilirubin | 5th Generation Bile Acids
Glucose - 6 - Phosphate Dehydrogenase (G6PDH) | Glutamate Dehydrogenase (GLDH)
Immunoglobulin E (IgE) | Copper | Zinc

## Aldolase

NP

Aldolase is an enzyme responsible for converting glucose into energy. In humans, the approximate normal range for Aldolase is 1 - 7.6U/L. Elevated levels are detectable in the blood of individuals with **skeletal muscle damage and liver disease**. In skeletal muscle diseases, including muscular dystrophy; damaged cells lyse, releasing aldolase into the blood. Levels also rise in conditions such as injury and gangrene, however remain normal in situations where weakness is caused by a neurological disease e.g. multiple sclerosis.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | AD189 | R1 5 x 20ml |
| | | R2 2 x 1ml |
| | | R3 1 vial |

### Randox Aldolase

- **Lyophilised reagents** for enhanced stability
- **Excellent measuring range of 1.73 - 106U/l** for the comfortable detection of clinically important results
- **UV method**
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Dedicated aldolase controls and calibrator available** for a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

## Cystatin C NP

Cystatin C is a small (13 kDa) cysteine proteinase inhibitor produced at a constant rate by all nucleated cells. The small molecular weight of Cystatin C allows it to be completely removed and broken down by the kidneys. Levels therefore remain steady if the kidneys are working efficiently and the Glomerular Filtration Rate (GFR) is normal. Cystatin C is a particularly useful marker of renal function in patients where creatinine measurements are not reliable e.g. individuals who are: obese, malnourished, have liver cirrhosis or reduced muscle mass. Furthermore, unlike Creatinine, Cystatin C does not have a 'blind area' - **up to 50% of renal function can be lost before significant creatinine elevation occurs**. Cystatin C is extremely sensitive to very small changes in GFR and is therefore capable of detecting **early stage kidney dysfunction.**

### Ordering Information

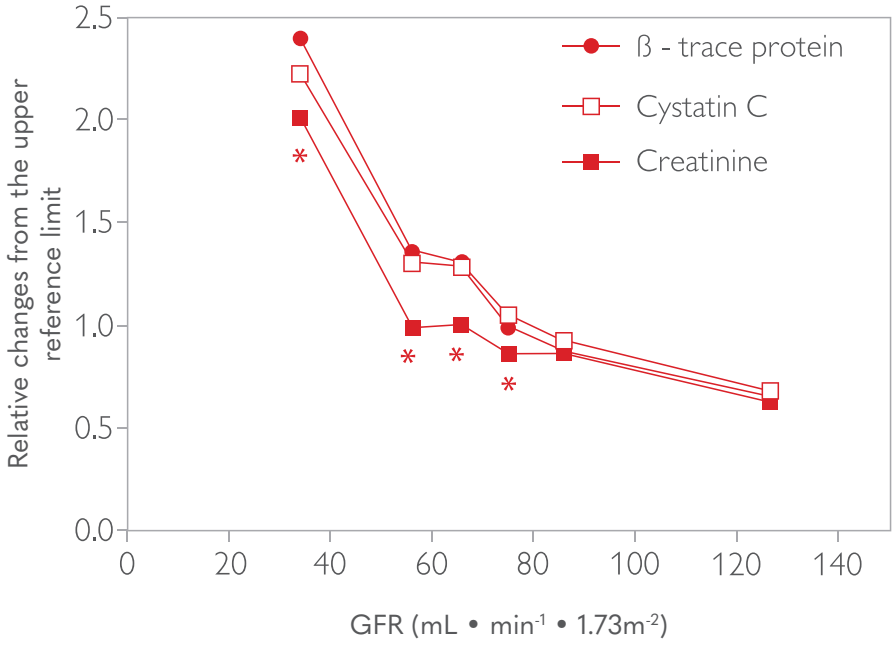
| | | |
|---|---|---|
| Cat. No: | CYS4004 ♦ | R1 2 x 17.6ml |
| | | R2 2 x 6.1ml |

♦ Indicates liquid option

### Randox Cystatin C

- **Liquid ready-to-use reagents** convenience and ease-of-use
- **Extensive measuring range of 0.4 - 10mg/l**, for the comfortable detection of clinically important results
- **Stable until expiry** when stored at +2°C to +8°C
- **Latex enhanced immunoturbidimetric method**
- **Dedicated Cystatin C control and calibrator available** offering a complete testing package

Fig 3. Relative changes of Cystatin C and Creatinine from their upper reference limits in different degrees of renal failure[3]




For specific catalogue numbers, please refer to IFU for full performance details

## Vanadate Oxidation Bilirubin

Bilirubin levels are extremely valuable for the diagnosis and monitoring of **liver diseases including: hepatitis, cirrhosis and gallstones**. Other conditions characterised by elevated Bilirubin concentrations include **haemolytic anaemia and sickle cell disease**. It is vital that Bilirubin levels are tested in new - borns where **jaundice** has not resolved itself within 8 - 14 days, as elevated levels can indicate a problem with the formation of the bile ducts or **irregular metabolism in the liver**.

In a study by Kaumeyer et. al., (2022) the vanadate oxidation method displayed excellent correlation (r= 0.97) and no clinically significant haemolytic interference up to an H Index of 1300, resulting in a significant reduction in rejected paediatric samples due to this common form of interference when compared with the diazo method.

## Ordering Information

| | | |
|---|---|---|
| Cat. No: | BR9765 ♦ | R1 4 x 14ml |
| | | R2 4 x 6ml (Direct) |
| | BR9766 ♦ | R1 4 x 68ml |
| | | R2 4 x 25ml (Total) |
| | BR4060 ♦ | R1 4 x 20ml |
| | | R2 4 x 8ml (Direct) |
| | BR4061 ♦ | R1 4 x 20ml |
| | | R2 4 x 8ml (Total) |
| | BR8377 ♦ | R1 4 x 20ml |
| | | R2 4 x 8ml (Total) |
| | BR8308 ♦ | R1 4 x 20ml |
| | | R2 4 x 8ml (Direct) |
| | BR8132 ♦ | R1 4 x 52.2ml |
| | | R2 4 x 20ml (Total) |
| | BR8133 ♦ | R1 4 x 52.2ml |
| | | R2 4 x 20ml (Direct) |

♦ Indicates liquid option

## Randox Vanadate Oxidation Bilirubin

UF **The Vanadate Oxidation methodology** is a superior method for haemolytic and lipaemic samples

- **Limited interference** from Haemoglobin and Lipids
- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **No pre-step required** whereas 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
- **Stable until expiry** when stored at +2°C to +8°C
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Controls and calibrator available** offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

## Randox 5th Generation Total Bile Acids

Bile Acids is a highly sensitive **marker of liver function**, enabling the early confirmation of liver disease. Bile Acids is also the most accurate method for diagnosing **obstetric cholestasis** in pregnant women, a common liver condition affecting women during the second and third trimester of pregnancy. The condition restricts the flow of bile through the gallbladder resulting in a build - up of bile acids in the liver. Consequently bile acids leak into the bloodstream where they are detected at increased levels.

The 5th generation Bile Acids assay displays impressive precision at both ends of the clinical range (1.1% and 0.9% respectively), excellent linearity and reproducibility, providing improved prognostic and therapeutic value for intrahepatic cholestasis of pregnancy as shown by Masri, et. al., 2020.

## Ordering Information

| | | |
|---|---|---|
| Cat. No: | BI7982 ♦ | R1 6 x 50ml |
| | | R2 6 x 18ml |
| | BI3863 ♦ | R1 2 x 18ml |
| | | R2 2 x 8ml |
| | BI8150 ♦ | R1 2 x 17.7ml |
| | | R2 2 x 8.9ml |

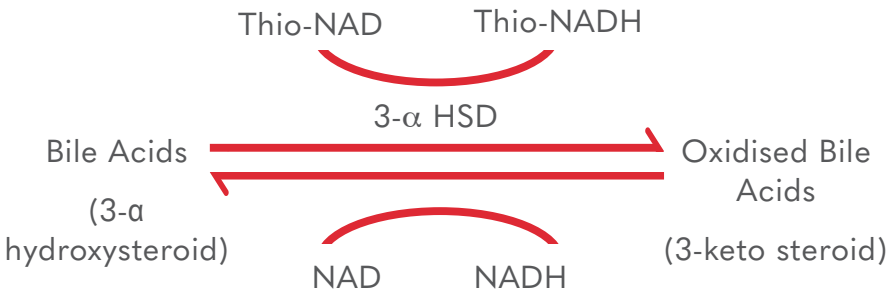
♦ Indicates liquid option

## Randox 5th Generation Total Bile Acids

UF **Superior methodology** utilising an advanced enzyme cycling method which displays outstanding sensitivity and precision when compared to traditional enzymatic based tests

- **Liquid ready-to-use reagents** for convenience and ease-of-use
- **Excellent linearity up to 188µmol/l.** The normal upper range of Bile Acids in a fasting serum sample is 10µmol/l
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Controls and calibrator available** offering a complete testing package

Fig 5. Assay principle




For specific catalogue numbers, please refer to IFU for full performance details

## Glucose - 6 - Phosphate Dehydrogenase (G6PDH) NP

G6PDH is a cytosolic enzyme located on the X - chromosome of bodily cells. G6PDH is involved in the normal processing of carbohydrates. It also plays a critical role in red blood cells (RBC), protecting them from damage and premature destruction. A deficiency in the G6PDH enzyme is not enough to promote the onset of haemolysis, but rather it is triggered by additional factors such as medications to treat malaria and favism which initiates oxidative stress and RBC destruction. If the bone marrow cannot compensate for the reduction of red blood cells, **haemolytic anaemia** can occur.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | PD410 | R1 1 x 100ml |
| | | R2 1 x 2ml |
| | | R3 1 x 2ml |
| | | R4 1 x 20ml |
| | PD2616 | R1a 3 x 25ml |
| | | R1b 1 x 80ml |

### Randox G6PDH

UF **Superior stability** of 4 weeks once reconstituted and stored at +2°C to +8°C. Many other commercially available assays offer just 5 days stability, leading to greater product wastage

UF **Minimal interference** as the sample pre - wash step included in the Randox G6PDH kit serves to purify the sample, leading to no significant interferences being observed

- **Lyophilised reagents** for enhanced stability
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers (PD410)
- **Dedicated G6PDH control available** offering a complete testing package

## Glutamate Dehydrogenase (GLDH)

GLDH measurements can be taken to evaluate the liver function. Elevated blood serum levels indicate liver damage. GLDH also plays an important role in the differential diagnosis of liver disease, especially in combination with aminotransferases. Liver diseases, such as toxic liver damage or hypoxic liver disease, are characterised by high serum levels. In clinical trials, GLDH can also be used as a measurement for the safety of a drug.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | GL441 | R1a 1 x 70ml |
| | | R1b 8 x 6ml |
| | | R2 2 x 20ml |
| | GL442 | R1a 5 x 100ml |
| | | R1b 5 x 100ml |
| | | R2 2 x 20ml |

### Randox GLDH

- Optimised standard method according to the recommendations of the Deutsche Gesellschaft für Klinische Chemie. This procedure measures the non-specific creep reaction
- Lyophilised reagents for enhanced stability
- Excellent correlation of r=0.99 when compared against other commercially available methods
- Open vial stability of 1 week at +2°C to +8°C

For specific catalogue numbers, please refer to IFU for full performance details

## Immunoglobulin E (IgE)

NP

Immunoglobulin E (IgE) is normally found in the blood in trace amounts. IgE is an antibody released by the immune system as a defence mechanism when it believes the body is at risk. IgE is used as a guide in the diagnosis of allergic reactions, including: **asthma, hay fever, dermatitis and food allergies**. It may also be tested in **parasitic infections**. Although testing for IgE will not diagnose a specific allergy, increased concentrations will indicate that an allergic response has occurred, facilitating further investigation.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | IE7308 ♦ | R1 1 x 8ml |
| | | R2 1 x 5ml |
| | IE8152 ♦ | R1 1 x 8.7ml |
| | | R2 1 x 5.7ml |

♦ Indicates liquid option

### Randox IgE

- **Liquid ready-to-use** reagents for convenience and ease-of-use
- **Extensive measuring range of 19.6 - 1007IU/ml**, for the comfortable detection of clinically important results
- **Limited interference** from Bilirubin, Haemoglobin, Intralipid® and Triglycerides producing highly accurate results
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- Immunoturbidimetric method
- **Dedicated IgE calibrator** for automation
- **Controls available** offering a complete testing package

## Copper

NP

Copper is an essential trace element found in human nutrition and is a cofactor for proteins. Copper is important for a number of functions including the creation of connective tissues, production of energy in cells as well as nervous system and brain functions.

Copper testing is predominantly carried out to diagnose **Wilson Disease**, an inherited disorder which is associated with excess copper storage in the brain, liver and other organs. Wilson Disease prohibits the liver from safely storing and excreting copper, resulting in it seeping out of the liver; building up in the eyes, kidneys and brain causing nerve damage, and if left untreated, it can be fatal.

Copper deficiency can also occur, however, this is less common. **Menkes Disease** is a genetic condition which commonly occurs in premature babies, resulting in bone abnormalities and fractures. Menkes Disease is characterised by sparse, kinky hair, developmental problems and seizures as young children with this disorder are unable to absorb enough copper.

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | CU2340 ♦ | R1a 1 x 105ml |
| | | R1b 5 x 20ml |
| | | R2 1 x 30ml |
| | | CAL 1 x 5.5ml |

♦ Indicates liquid option

### Randox Copper

- **Stable for 2 weeks** when stored at +2°C to +8°C, minimising reagent waste
- **Standard supplied with kit** simplifying the ordering process
- **Extensive measuring range of 6.6 - 86µmol/l,** for the comfortable detection of clinically important results
- Colorimetric method
- **Controls available** offering a complete testing package
- **Applications available** detailing instrument-specific settings for a wide range of clinical chemistry analysers

For specific catalogue numbers, please refer to IFU for full performance details

## Zinc

Zinc is an essential trace metal which is required for a number of functions including cell and enzyme production, the metabolism of carbohydrates, fat and protein from dietary intake and wound healing. Zinc deficiency is often the result of a low dietary intake and can lead to a number of problems including: **impaired immune and cognitive functions, foetal growth and development problems during pregnancy, liver and kidney disease, diabetes and malabsorption syndrome.**

### Ordering Information

| | | |
|---|---|---|
| Cat. No: | ZN2341 (S) ♦ | R1 1 x 50ml<br>R2a 2 x 100ml<br>R2b 1 x 50ml<br>CAL 1 x 20ml<br>(with Deproteinisation) |
| | ZN2607 | 6 x 50ml<br>(Deproteinising Solution) |

♦ Indicates liquid option
(S) Indicates standard included in kit, and is for manual and semi-automated use only

### Randox Zinc

- **Limited interference** from Haemoglobin, Bilirubin, Triglycerides and Intralipid®
- **Range of suitable sample types** including: serum, plasma and urine
- **Colorimetric method**
- **Applications available** detailing instrument - specific settings for a wide range of clinical chemistry analysers
- **Controls available** offering a complete testing package

For specific catalogue numbers, please refer to IFU for full performance details

## References


1. Mora. S, 2006. LDL Particle Size: Does It Matter?. Harvard Medical School. Boston, MA

2. Menzaghi, C, et al., 2007, Genetic Influences of Adiponectin on Insulin Resistance, Type 2 Diabetes, and Cardiovascular Disease. Perspectives in Diabetes, vol. 56, p. 1198-1209.

3. B-Trace Protein, Cystatin C, B2-Microglobulin, and Creatinine Compared for Detecting Impaired Glomerular Filtration Rates in Children. Filler, Guido, et al. 5, s.l. : Clinical Chemistry, 2002, Vol. 48.

4. First line defence antioxidants-superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPX): Their fundamental role in the entire antioxidant defence grid. Ighodaro, O.M and Akinloye, O.A. 4, Ibadan : Alexandria Journal of Medicine, 2018, Vol. 54.

5. Kaumeyer BA, Tjota MY, Parker K, et al. Use of a Vanadate Oxidation Conjugated Bilirubin Assay to Reduce Test Cancellations Resulting from Hemolyzed Specimens in Pediatric Patients. American Journal of Clinical Pathology. 2022;159(1):6-9. doi:https://doi.org/10.1093/ajcp/aqac139

6. Masri W, Plouvier E, Sedrati L, Bendaoud M, Costa Y. Acides biliaires: validation de la méthode et intérêt diagnostique en cas de cholestase gravidique [ Bile acids: Method validation and diagnosis of intrahepatic cholestasis of pregnancy ]. International Journal of Innovation and Applied Studies. 2020;29(4):842-847.


Please note: performance information presented was achieved using the Randox RX series of clinical analysers. Results may vary depending on the analyser used.

# Portfolio of Reagents

## HIGH PERFORMANCE & UNIQUE TESTS (DETAILS IN BROCHURE)

| Reagent | Page No |
|---|---|
| Aldolase | 18 |
| Apolipoprotein C - II | 5 |
| Apolipoprotein C - III | 5 |
| Apolipoprotein E | 6 |
| Bile Acids, 5th Gen | 21 |
| Bilirubin, Direct | 20 |
| Bilirubin, Total | 20 |
| Cholesterol sdLDL | 4 |
| Copper | 23 |
| Creatinine | 11 |
| Cystatin C | 19 |
| Fructosamine (Glycated Serum Protein) | 8 |

| Reagent | Page No |
|---|---|
| G6PDH | 22 |
| GLDH | 22 |
| Glutathione Reductase | 15 |
| Homocysteine | 5 |
| D - 3 - Hydroxybutyrate (Ranbut) | 6 |
| IgE | 23 |
| Lipoprotein (a) | 3 |
| Microalbumin | 12 |
| Non - Esterified Fatty Acids (NEFA) | 8 |
| Soluble Transferrin Receptor (sTfR) | 15 |
| Superoxide Dismutase (Ransod) | 16 |
| Total Antioxidant Status (TAS) | 14 |
| Zinc | 24 |

## OTHER ASSAYS AVAILABLE FROM RANDOX

Alanine Aminotransferase (ALT)
Albumin
Alkaline Phosphatase
Ammonia
Amylase
Amylase Pancreatic
Anti - Streptolysin O (ASO)
Apolipoprotein A - I
Apolipoprotein A - II
Apolipoprotein B
Aspartate Aminotransferase (AST)
Bile Acids, 4th Gen
Beta-2 Microglobulin
Calcium
Carbamazepine
Cholesterol, Total
Cholesterol, HDL
Cholesterol, LDL
Cholinesterase (Butyryl)
CK - MB
CK - NAC
CO2 Total
Complement C3
Complement C4
CRP
CRP, Canine
CRP, Full Range
CRP, High Sensitivity
Digoxin
Ethanol
Ferritin
Gamma GT
Glucose
Glutathione Peroxidase (Ransel)
Glycerol
Haptoglobin
HbA1c, Direct
HbA1c, Indirect
IgA
IgG
IgM
Iron
L - Lactate
Lactate Dehydrogenase L - P
Lactate Dehydrogenase P - L
Lipase
Magnesium
Phenobarbital
Phenytoin
Phosphorus
Potassium
Rheumatoid Factor (RF)
Sodium
Syphilis
Total Iron Binding Capacity (TIBC)
Total Protein
Transferrin
Triglycerides
Urea
Uric Acid
Urinary Protein
Valproic Acid

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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.

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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.

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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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