



# Solutions for Research & Drug Discovery

## Convenient, Safe and Versatile

BIOASSAY SYSTEMS offers assay kits that are simple, convenient to use and superior in performance. With our assay kits, researchers need little-to-no time for assay optimization. We specialize in biochemical and cell-based assays for both routine laboratory tests and for high-throughput drug discovery applications with a focus on safe, non-radioactive assay formats such as absorbance, fluorescence and luminescence detection techniques. Key features of our assays include simplicity, high-throughput, sensitivity, accuracy and low interference. Our product portfolio consists of kits and analytical services for a broad range of research areas including:

- ▶ Enzyme Activity
- ▶ Energy Metabolism
- ▶ Blood/Urine Chemistry
- ▶ Ion Assays
- ▶ Oxidative Stress
- ▶ HTS Reagents

For more information, please contact

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BioAssay Systems offers

- ▶ Assay kits and reagents
- ▶ Analytical services
- ▶ Assay design and development services

By offering kits that require as little as 5  $\mu$ L samples, BioAssay Systems has developed a portfolio of highly convenient and compatible assay kits.



Assay Kit Name	Cat #	Tests	Assay Kit Name	Cat #	Tests	Assay Kit Name	Cat #	Tests
Acetylcholine	EACL-100	100	Creatinine	DICT-500	500	Lactate Dehydrogenase	DLDH-100	100
Acetylcholinesterase	DACE-100	100	Cytotoxicity (luminescent)	ECTX-100	100	Lactose	ELAC-100	100
Adipolysis	EAPL-200	200	Cytotoxicity Reagent (Saponin)	CTTX-050	(50mg)	Lipase	DLPS-100	100
ADP	EADP-100	100	DNA	QFDN-250	250	Luciferase Reporter Gene	SLLU-200	200
ADP/ATP Ratio	ELDT-100	100	Ethanol (chemical)	DIET-500	500	Magnesium	DIMG-250	250
Albumin (BCG)	DIAG-250	250	Ethanol (enzymatic)	ECET-100	100	NAD/NADH	ECND-100	100
Albumin (BCP)	DIAP-250	250	Free Fatty Acid	EFFA-100	100	NADP/NADPH	ECNP-100	100
Alkaline Phosphatase	DALP-250	250	Fructose	EFRU-100	100	Nitric Oxide	D2NO-100	100
Ammonia/Ammonium	ENH3-100	100	Galactose	EGAL-100	100	Peroxidase	DPOD-100	100
$\alpha$ -Amylase (chemical)	DAMY-100	100	Glucose (chemical)	DIGL-100	100	Peroxide	DIOX-250	250
$\alpha$ -Amylase (enzymatic)	ECAM-100	100	Glucose (enzymatic)	EBGL-100	100	Phosphatase	POPN-01K	1,000
Antioxidant (TAC)	DTAC-100	100	$\alpha$ -Glucosidase	DAGD-100	100	Phosphatase	POPN-500	500
Arginase	DARG-200	200	$\beta$ -Glucosidase	DBGD-100	100	Phosphate	DIPI-500	500
Ascorbic Acid	EASC-100	100	Glutathione Peroxidase	EGPX-100	100	Phosphate	POMG-25H	2,500
ATP	EATP-100	100	Glutamate	EGLT-100	100	Pyruvate	EPYR-100	100
ATPase/GTPase	DATG-200	200	Glutamine	EGLN-100	100	Saccharide Removal Kit	DSRK-500	500
Bilirubin	DIBR-180	180	Glutathione	DIGT-250	250	Sialic Acid (chemical)	DSLA-100	100
Calcium	DICA-500	500	Glycerol	EGLY-200	200	Sialic Acid (enzymatic)	ESLA-100	100
Catalase	ECAT-100	100	Glycogen	E2GN-100	100	Starch	E2ST-100	100
Cell Viability (fluorimetry)	CQBL-05K	5,000	HDL and LDL/VLDL	E2HL-100	100	Sucrose	ESUC-100	100
Cell Viability (MTT)	CQMT-500	500	Heme	DIHM-250	250	Sulfate	DSFT-200	200
Chloride	DICL-250	250	Hemoglobin	DIHB-250	250	TBARS	DTBA-100	100
Cholesterol	E2CH-100	100	Iron	DIFE-250	250	Total Protein	QCPR-500	500
Choline	ECHO-100	100	Ketone Body	EKBD-100	100	Triglyceride	ETGA-200	200
Copper	DICU-250	250	Kinase	EKIN-400	400	Urea (BUN)	DIUR-500	500
Creatine	ECRT-100	100	L-Lactate	ECLC-100	100	Uric Acid	DIUA-250	250
Creatine Kinase	ECPK-100	100	D-Lactate	EDLC-100	100	Zinc	DIZN-250	250

# Solutions for Research and Drug Discovery: Convenient, Safe and Versatile

## Blood/Urine Chemistry Kits

### QuantiChrom™ Hemoglobin Assay Kit (DIHB-250)

*Colorimetric Determination of Total Hemoglobin at 400 nm*  
Quantitation of blood hemoglobin has been a key diagnostic parameter for various diseases such as anemia, polycythemia and dehydration. BioAssay Systems' hemoglobin assay kit is based on an improved Triton/NaOH method, in which the hemoglobin is converted into a uniform colored end product. The intensity of color is directly proportional to hemoglobin concentration in the sample. The optimized formulation exhibits high sensitivity and substantially reduces interference by substances in the raw samples.

### QuantiChrom™ Urea Assay Kit (DIUR-500)

*Quantitative Colorimetric Urea Determination at 520 nm*  
UREA determination is very useful for the medical clinician to assess kidney function of patients. In general, increased urea levels are associated with nephritis, renal ischemia, urinary tract obstruction, and certain extrarenal diseases. Decreased levels indicate acute hepatic insufficiency or may result from over-vigorous parenteral fluid therapy. BioAssay Systems' urea assay kit is designed to measure urea directly in biological samples without any pretreatment. The improved Jung method utilizes a chromogenic reagent that forms a colored complex specifically with urea. The intensity of the color, measured at 520 nm, is directly proportional to the urea concentration in the sample. The optimized formulation substantially reduces interference by substances in the raw samples.

### EnzyChrom™ Cholesterol Assay Kit (E2CH-100)

*Quantitative Determination of Cholesterol at 570 nm*  
Elevated levels of cholesterol have been associated with cardiovascular diseases such as atherosclerosis; whereas, low levels may be linked to depression, cancer and cerebral hemorrhage. BioAssay Systems' cholesterol assay uses a single working reagent that combines cholesterol ester hydrolysis, oxidation and color reaction in one step. The color intensity of the reaction product at 570 nm or fluorescence intensity at  $\lambda_{em}/\lambda_{ex} = 585/530$  nm is directly proportional to total cholesterol concentration in the sample.

### EnzyChrom™ HDL and LDL/VLDL Kit (E2HL-100)

*Quantitative Determination of HDL and LDL/VLDL CHOLESTEROL concentrations in High-Density Lipoprotein (HDL) and Low-Density (LDL)/Very-Low-Density (VLDL) Lipoproteins are strong predictors for coronary heart disease. Functional HDL offers protection by removing cholesterol from cells and atheroma. Higher concentrations of LDL and lower concentrations of functional HDL are strongly associated with cardiovascular disease due to higher risk of atherosclerosis. BioAssay Systems' HDL and LDL/VLDL kit is based on an improved PEG precipitation method in which HDL and LDL/VLDL are separated, and cholesterol concentrations in the HDL and LDL/VLDL fractions are determined colorimetrically at 570 nm or fluorimetrically at  $\lambda_{em}/\lambda_{ex} = 585/530$  nm.*

## Enzyme Activity Kits

### QuantiChrom™ Arginase Assay Kit (DARG-200)

*Colorimetric Determination of Arginase Activity*  
ARGINASE is present in mammals and plants. In humans, arginase is expressed predominantly in the liver, and to lesser degrees in breast, kidney, testes, salivary glands, and erythrocytes. Arginase catalyzes the conversion of arginine to ornithine and urea, completing the last step in the urea cycle. Arginase activity is a key diagnostic indicator. Increased levels of arginase activity in blood have been associated with liver damage while arginase deficiency is due to an inherited autosomal recessive disease. BioAssay Systems' arginase assay kit provides a sensitive and convenient method for arginase activity determination. The method utilizes a chromogen that forms a colored complex specifically with urea produced in the arginase reaction. The intensity of the color is directly proportional to the arginase activity in the sample.

### QuantiChrom™ Lipase Assay Kit (DLPS-100)

*Colorimetric Determination of Lipase Activity at 412 nm*  
Human pancreatic lipase and its related protein 2 are the main lipases secreted by the pancreas. In acute pancreatitis, lipase levels can rise 5 to 10-fold within 24 to 48 hours. Increased activities have also been associated with pancreatic duct obstruction, pancreatic cancer, kidney disease, salivary gland inflammation, and other pancreatic diseases. Decreased levels may indicate permanent damage to lipase-producing cells in the pancreas. BioAssay Systems' lipase assay is based on an improved dimercaptopropanol tributryrate method, in which SH groups formed from lipase cleavage of dimercaptopropanol tributryrate react with 5,5'-dithiobis (2-nitrobenzoic acid) to form a yellow colored product. The color intensity, measured at 412 nm, is proportionate to the enzyme activity in the sample.

### EnzyChrom™ Creatine Kinase Assay Kit (ECPK-100)

*Colorimetric Determination of Creatine Kinase Activity*  
CREATINE KINASE is an enzyme expressed predominantly in skeletal muscle, smooth muscle and the brain and catalyzes the conversion of creatine to phosphocreatine, consuming ATP and generating ADP. Creatine kinase is often determined routinely in emergency patients with chest pain and acute renal failure. Elevation of creatine kinase is an indication of damage to muscle and has been associated with injury, rhabdomyolysis, myocardial infarction, myositis, myocarditis, malignant hyperthermia and neuroleptic malignant syndrome. Lower levels can be an indication of alcoholic liver disease and rheumatoid arthritis. BioAssay Systems' creatine kinase assay kit is based on enzyme coupled reactions in which creatine phosphate and ADP is converted to creatine and ATP by creatine kinase, the generated ATP is used to phosphorylate glucose by hexokinase to generate glucose-6-phosphate, which is then oxidized by NADP by glucose-6-phosphate dehydrogenase. The produced NADPH, measured at 340 nm, is proportionate to the enzyme activity in the sample.

## Energy Metabolism Assay Kits

### EnzyChrom™ L-Lactate Assay Kit (ECLC-100)

*Colorimetric Determination of L-Lactate at 565 nm*  
LACTATE is generated by lactate dehydrogenase (LDH) under hypoxic or anaerobic conditions. Monitoring lactate levels is, therefore, a good indicator of the balance between tissue oxygen demand and utilization and is useful when studying cellular and animal physiology. BioAssay Systems' lactate assay kit is based on lactate dehydrogenase catalyzed oxidation of lactate, in which the formed NADH is coupled to the formazan (MTT)/phenazine methosulfate (PMS) Reagent. The intensity of the product color, measured at 565 nm, is directly proportionate to the lactate concentration in the sample. This room temperature assay involves adding a single working reagent to the sample, and reading the optical density at time zero and at 20 min.. Assay detects as low as 50  $\mu$ M L-lactate in serum, plasma, and cell media samples.

### EnzyChrom™ NADP<sup>+</sup>/NADPH Assay Kit (ECNP-100)

*Colorimetric Determination of NADP<sup>+</sup>/NADPH at 565 nm*  
Pyridine nucleotides play an important role in metabolism, thus, there is continual interest in monitoring their concentration levels. Quantitative determination of NADP<sup>+</sup>/NADPH has applications in research pertaining to energy transformation and redox state of cells or tissue. BioAssay Systems' NADP<sup>+</sup>/NADPH assay kit is based on a glucose dehydrogenase cycling reaction, in which a tetrazolium dye (MTT) is reduced by NADPH in the presence of phenazine methosulfate (PMS). The intensity of the reduced product color, measured at 565 nm, is proportionate to the NADP<sup>+</sup>/NADPH concentration in the sample. This assay is highly specific for NADP<sup>+</sup>/NADPH and is not interfered by NAD<sup>+</sup>/NADH. Our assay is a convenient method to measure NADP, NADPH and their ratio. Direct Assays: NADP<sup>+</sup>/NADPH concentrations and ratios in cell or tissue extracts. This high-throughput assay detects as low as 0.1  $\mu$ M NADP<sup>+</sup>/NADPH in 96-well format.

## Oxidative Stress Assay Kits

### QuantiChrom™ Nitric Oxide Assay Kit (DINO-250)

*Quantitative Colorimetric Determination of Nitric Oxide*  
NITRIC OXIDE is a reactive radical that plays an important role in many key physiological functions. Nitric oxide, an oxidation product of arginine by nitric oxide synthase, is involved in host defense and development and activation of regulatory proteins. BioAssay Systems' nitric oxide assay kit is designed to accurately measure nitric oxide production following reduction of nitrate to nitrite using an improved Griess reagent. The procedure is simple and the time required for sample pretreatment and assay is reduced to only 40 min. Linear detection range 0.1 - 50  $\mu$ M nitric oxide in 96-well plate assay. This improved assay can be used to determine nitric oxide in plasma, serum, urine, tissue and cellular extracts.

## Ion Assay Kits

### QuantiChrom™ Calcium Assay Kit (DICA-500)

*Quantitative Colorimetric Calcium Determination at 612 nm*  
Increased calcium levels in serum are reported in hyperparathyroidism, metastatic bone lesions and hypervitaminosis, while decreased levels are observed in hypoparathyroidism, nephrosis, rickets, steatorrhea, nephritis and calcium losing syndromes. BioAssay Systems' calcium assay kit is designed to measure calcium directly in biological samples without any pretreatment. A phenolsulphonphthalein dye in the kit forms a very stable blue colored complex specifically with calcium. The intensity of the color, measured at 612 nm, is directly proportional to the calcium concentration in the sample. The optimized formulation minimizes any interference by substances such as magnesium, lipid, protein and bilirubin.

## High-throughput Assay Reagents

### SuperLight™ Luciferase Reporter Gene Assays

#### *Bioluminescent Assay for Luciferase Reporter Expression*

This bioluminescent reporter gene assay is extremely sensitive and is especially suitable for quantifying luciferase expression in recombinant cells. This ultra-sensitive, homogeneous cell-based assay only requires adding a single reagent to the cells and measuring the light intensity after a short incubation step (2 minutes). Assays can be performed in tubes, cuvettes or multi-well plates. All kit components are compatible with culture media and with all liquid handling systems. With an extended luminescence emission kinetics (half-life 40 min), the SuperLight™ luciferase assays are especially suitable for high-throughput screening in 96-well, 384-well and 1536-well plates. In addition, the reagent provided in the kits has been formulated for maximum sensitivity, reproducibility and long shelf-life. Applications for this kit include gene regulation studies and high-throughput screening of gene modulators.

### EnzyChrom™ Kinase Assay Kit (EKIN-400)

#### *Fluorimetric High-throughput Kinase Assay*

KINASES, also known as phosphotransferases, constitute a large family of enzymes that transfer phosphate groups from the high-energy donor molecule ATP to their specific substrates. Kinases are known to regulate the majority of cellular processes. The largest group of this family is the protein kinases. So far, 518 different kinases have been identified in humans and up to 30% of human proteins are modified by these kinases. The enormous diversity and their key role in cellular signaling make them ideal targets for drug developments. BioAssay Systems' EnzyChrom™ Kinase Assay Kit provides a simple and rapid method for assaying kinase activity and high-throughput screening for kinase inhibitors. This homogeneous microplate-based assay involves incubating the kinase with a single working reagent, in which ADP is enzymatically converted to ATP and pyruvate, which is quantified using a fluorimetric assay (530nm/590nm) method.