

Kits and Assays for Cell Biology



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Offer valid until 31. December 2009!

Alzheimer's
Antibody Isotyping
Antibody Labeling
Antibody Purification
Antibody Staining
Apoptosis Detection
Caspases
Cell Analysis
Cell Stress
Cell Cycle
Cyclic Nucleotides
Cytoskeleton
Gene Regulation
Kinases
Nitric Oxide Metabolism
PKH and CellVue® Claret
Fluorescent Cell Linker Kits

Alzheimer's Disease

BACE1 ACTIVITY ASSAY KIT (FRET)

Prod. No. CS0010-1KT	Cat. Price 674,00 €	Special Price 539,00 €
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BACE1 is a transmembrane protease responsible for the β site cleavage of the amyloid precursor protein (APP) to produce amyloid β peptide (AB). The accumulation of AB in the brain is a primary cause for the progression of Alzheimer's. BACE1 is a target for inhibitor drug discovery. The kit provides all the reagents required for an efficient detection of BACE1 activity. It contains an enzyme to be used for screening for potential BACE1 inhibitors. The assay is based on the fluorescence resonance energy transfer (FRET) method in which the fluorescence signal enhancement is observed after substrate cleavage by BACE1. 1 kit sufficient for 250 reactions.

Antibody Isotyping

MOUSE MONOCLONAL ANTIBODY ISOTYPING

Prod. No. ISO2-1KT	Cat. Price 296,00 €	Special Price 236,00 €
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Determination of the subclass of a monoclonal antibody is helpful for characterization of the antibody, for choosing detection reagents, and for deciding on a purification scheme.

- May be used in a variety of assay formats
- Suitable for all antibody forms
- Determines all mouse IgG subclasses, IgA, and IgM

ISO-2 contains 0.2 mL vials of subclass specific antibodies to all four mouse IgG subclasses, IgA, and IgM. Directions are included for using these reagents in ELISA and Ouchterlony assays to determine the subclass of monoclonal antibodies in ascites, culture supernatants, or purified preparations. Additional reagents may be required, such as conjugates for ELISA assays or agarose and buffer components for Ouchterlony assays. Sufficient for 1000 tests (clones) (by ELISA) or 40 tests (clones) (by immunodiffusion, ODD)

Antibody Labeling

FLUOROTAG FITC CONJUGATION KIT

Prod. No. FITC1-1KT	Cat. Price 288,50 €	Special Price 230,00 €
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Sigma offers a convenient kit for preparing FITC-labeled antibodies. Fluorescein isothiocyanate (FITC), Isomer 1, is a widely used fluorophore, popular because of its high quantum efficiency and stability when conjugated. FITC is yellow-orange in color with an absorption maximum at 495 nm. Upon excitation it emits a yellow-green color with an emission maximum at 525 nm. Conjugation occurs through free amino groups of proteins or peptides, forming a stable thiourea bond (see reaction). FITC conjugates of antibodies, lectins, hormones, and growth factors have been used in a variety of immunohistochemical and flow cytometry applications. The protocols have been optimized for antibodies, but may be adapted to other proteins by the end user.

- Suitable for both small (1 mg) and large (5 mg) scale conjugations
- Completely aqueous procedure - no DMF needed
- Fast gel filtration separation of conjugate from excess FITC
- Complete protocols for conjugation and F/P ratio determination
- Sufficient reagents for at least 5 conjugations of 5 mg protein each and for optimization of F/P ratio before scale-up
- References for applications and protocols

Antibody Purification

PROTEIN G IMMUNOPRECIPITATION KIT

Prod. No. IP50-1KT	Cat. Price 509,00 €	Special Price 407,00 €
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The kit is designed to allow maximal recovery of immunoprecipitates. It provides all the necessary reagents to perform immunoprecipitation from cell extracts of any protein to which a suitable antibody is available. Based on protein G, the kit binds to most commonly used antibodies. In addition, spin columns are provided to enable quick washes without the loss of protein G resin and thus protein yield is maximized.

- Minimal loss of antigen-antibody bound beads during washing.
- Minimal or no non-specific signals by increasing the stringency of the washing step.

Sufficient for 50 assays

Antibody Purification

Protein A Antibody Purification Kit

Prod. No. PURE1A-1KT	Cat. Price 443,50 €	Special Price 354,00 €
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PURE-1A offers Protein A technology in a prepackaged, easy to use kit form. With this kit, milligram quantities of IgG can be purified from serum, ascites, or cell culture supernatants.

Purification of IgG from other species may be possible, however, the researcher will have to determine the suitability of the kit for their application.

- High capacity - purify up to 8 mg of mouse IgG or 25 mg of human IgG per column run
- Specific - will only bind IgG
- Easy to use - antibody is eluted and desalted in a single step, ready to use
- Gentle - avoids prolonged exposure of the antibody to low pH

Using our cartridge system, antibodies elute as highly purified proteins at physiological pH. Protein A is a powerful tool for isolation of antibodies from mammalian hosts. Protein A exhibits a high degree of specificity for IgG and ensures an antibody preparation virtually free of IgA, IgM and non-immunoglobulin serum proteins such as albumin.

Sufficient for 10 purifications

Antibody Staining

MOUSE EXTRAVIDIN STAINING KIT

Prod. No. EXTRA2-1K	Cat. Price 393,50 €	Special Price 315,00 €
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These kits comprise universal reagents for use with primary antibodies in immunohistology, ELISA, and immunoblotting. ExtrAvidin® is a unique form of avidin, available only from Sigma, that combines the high specificity and affinity of avidin for biotin with low non-specific binding at physiological pH. ExtrAvidin® peroxidase exhibits high sensitivity with low background.

- Use in immunohistology, ELISA, and immunoblotting assays.
- Affinity Isolated Antibodies have been adsorbed with human IgG and IgM to minimize cross-reactivity.
- Biotinylated antibodies contain a spacer which improves accessibility for the ExtrAvidin® conjugates.

Sufficient for 2,000 tests ELISA, Dot blot or 200 tests Immunohistology

Apoptosis Detection

ANNEXIN V-CY3 APOPTOSIS DETECTION KIT

Prod. No. APOAC-1KT	Cat. Price 388,00 €	Special Price 310,00 €
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Sigma's Annexin V-Cy3 kit allows detection of annexin V bound to apoptotic cells by fluorescence microscopy. The Annexin V-Cy3 kit uses the dye Cy3.18 as the fluorochrome conjugated with annexin V. By microscopy, Cy3.18 fluoresces more brightly than the FITC conjugate. The kit includes the non-fluorescent compound 6-carboxyfluorescein diacetate (6-CFDA), which enters the cell and is hydrolyzed by the esterases present in living cells to the fluorescent compound 6-carboxyfluorescein, indicating that the cells are viable. This combination allows the differentiation among early apoptotic cells (annexin V positive, 6-CFDA positive), necrotic cells (annexin V positive, 6-CFDA negative), and viable cells (annexin V negative, 6-CFDA positive).

Sufficient for 200 tests

Apoptosis Detection

APOPTOSIS DETECTION KIT

Prod. No. APOAF-20TST APOAF-50TST	Cat. Price 240,00 € 502,00 €	Special Price 192,00 € 401,00 €
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Annexin V-FITC kit allows fluorescent detection of annexin V bound to apoptotic cells and quantitative determination by flow cytometry. The AnnexinV-FITC kit uses annexin V conjugated with fluorescein isothiocyanate (FITC) to label phosphatidylserine sites on the membrane surface. The kit includes propidium iodide (PI) to label the cellular DNA in necrotic cells where the cell membrane has been totally compromised. This combination allows the differentiation among early apoptotic cells (annexin V positive, PI negative), necrotic cells (annexin V positive, PI positive), and viable cells (annexin V negative, PI negative).

Caspases

CASPASE-3 ASSAY KIT, COLORIMETRIC

Prod. No. CASP3C-1KT	Cat. Price 579,00 €	Special Price 463,00 €
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The Caspase 3 Colorimetric Assay Kit is based on the hydrolysis of acetyl-Asp-Glu-Val-Asp p-nitroanilide (Ac-DEVD-pNA) by caspase 3, resulting in the release of the p-nitroaniline (pNA) moiety. p-Nitroaniline is detected at 405 nm ($\epsilon_{\text{mM}}=10.5$). The concentration of the pNA released from the substrate is calculated from either the absorbance values at 405 nm or from a calibration curve prepared with pNA standards (pNA standard included with the kit).

Sufficient for 1,000 multiwell tests (in 96-well multiwell plates) or for 100 standard tests (1 ml)

Caspases

CASPASE-3 ASSAY KIT, FLUORIMETRIC

Prod. No. CASP3F-1KT	Cat. Price 577,00 €	Special Price 462,00 €
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The Caspase 3 Fluorometric Assay Kit is based on the hydrolysis of acetyl Asp-Glu-Val-Asp 7-amido-4-methylcoumarin (Ac-DEVD-AMC) by caspase 3, resulting in the release of the fluorescent 7-amino-4-methylcoumarin (AMC). The excitation and emission wavelengths of AMC are 360 nm and 460 nm respectively. The concentration of the AMC released can be calculated from a calibration curve prepared with AMC standards (AMC standard included with the kit).

Sufficient for 1,000 multiwell tests or for 100 standard tests (2 ml)

Cell Analysis

GLUTATHIONE ASSAY KIT

Prod. No. CS0260-1KT	Cat. Price 387,00 €	Special Price 309,00 €
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Reduced glutathione (GSH), a tripeptide (g-glutamyl-cysteinylglycine), is the major free thiol in most living cells and is involved in many biological processes such as detoxification of xenobiotics, removal of hydroperoxides, and maintenance of the oxidation state of protein sulfhydryls. It is the key antioxidant in animal tissues. The kit provides all reagents for simple and quick assay to measure the level of total glutathione (GSSG + GSH) in a cell and tissue extracts and in red blood cells or plasma. The sample is first deproteinized with the 5% 5-sulfosalicylic acid solution. Glutathione content of the sample is then assayed using a kinetic assay in which catalytic amounts of glutathione cause a continuous reduction of 5,5'-dithiobis-(2-nitrobenzoic) acid (DTNB) to TNB. The oxidised glutathione formed is recycled by glutathione reductase and NADPH. The product, TNB, is assayed colorimetrically at 412 nm. Sufficient for 700 assays

Cell Analysis

GLUTATHIONE S-TRANSFERASE (GST) ASSAY K

Prod. No. CS0410-1KT	Cat. Price 322,00 €	Special Price 258,00 €
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The Glutathione S-Transferase Assay kit utilizes 1-Chloro-2,4-dinitrobenzene (CDNB), which is suitable for the broadest range of GST isozymes. Upon conjugation of the thiol group of glutathione to the CDNB substrate, there is an increase in the absorbance at 340 nm. The assay is intended for the measurement of the total GST activity in cell and bacterial lysates, tissue homogenates, and plasma and erythrocytes lysates. Glutathione S-transferases (GSTs) are a group of enzymes important in the detoxification of many xenobiotics in mammals. The enzymes protect cells against toxicants by conjugating the thiol group of the glutathione to electrophilic xenobiotics, and thereby defend cells against the mutagenic, carcinogenic, and toxic effects of the compounds. GST activity is present in plants, insects, yeast, bacteria, and most mammalian tissues especially in the liver, which plays a key role in detoxification.

Sufficient for 500 multiwell tests

Cell Analysis

CITRATE SYNTHASE ASSAY KIT

Prod. No. CS0720-1KT	Cat. Price 553,00 €	Special Price 442,00 €
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The Citrate Synthase Assay Kit contains all the required reagents (including a positive control enzyme) for a fast and simple measurement of citrate synthase activity in a whole cell extract or in isolated mitochondria. In addition, the kit enables testing of the intactness of the mitochondrial inner membrane. The activity of the enzyme is measured by following the color of TNB, which is generated from DTNB present in the reaction of citrate synthesis, and caused by the deacetylation of Acetyl-CoA. The overall reaction product, TNB, absorbs at 412 nm. Citrate synthase is the initial enzyme of the tricarboxylic acid (TCA) cycle. The enzyme catalyzes the reaction of 2 carbon acetyl CoA with 4 carbon oxaloacetate to form the 6 carbon citrate. This enzyme is an exclusive marker of the mitochondrial matrix.

1 kit sufficient for 100 reactions (using a 1 ml cuvette)

1 kit sufficient for 480 reactions (using 96 multiwell plates)

Cell Analysis

CATHEPSIN D ASSAY KIT

Prod. No. CS0800-1KT	Cat. Price 449,50 €	Special Price 359,00 €
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The assay is based on the hydrolysis, by the enzyme, of an internally quenched fluorimetric substrate. Cathepsin D, a ubiquitous aspartic protease belonging to the A1 peptidase family, is found intracellularly in lysosomes. The enzyme has been associated with various biological processes such as: apoptotic events (e.g., the release of cytochrome c from mitochondria and the loss of the transmembrane potential ($\Delta\psi$), aging, Alzheimer's disease, and breast cancer. Contains all the reagents required for the measurement of the cathepsin D activity in cell and tissue lysates.

- The bottom limit of detection is 750 pg of protein (or 13 femtomoles of enzyme).
- A single step reaction with direct, real time observation of the degradation product released by the enzyme.
- The kit has been tested on extracts from CHO, HeLa, HEK 293, A431, HepG2, U937, and Jurkat cells on *S. cerevisiae* and on rat brain, kidney and liver tissues.

1 Kit sufficient for 120 assays (100 μ L)

Cell Analysis/Cell Stress

TOTAL ANTIOXIDANT ASSAY KIT

Prod. No. CS0790-1KT	Cat. Price 355,50 €	Special Price 284,00 €
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The kit provides all of the reagents required for an efficient measurement of the total antioxidant capacity of plasma, serum, urine, saliva, cells, and tissue lysates. It was tested on A431 and CHO cell lysates; rat brain, liver, and kidney lysates; human plasma, serum, urine, and saliva. The antioxidant assay is based on the formation of a ferryl myoglobin radical from myoglobin and hydrogen peroxide, which oxidizes the ABTS (2,2'-azino-bis(3-ethylbenzthiazoline-6-sulfonic acid) to produce a radical cation ABTS⁺, a soluble green color chromogen that can be determined at 405 nm. In the presence of antioxidants the radical cation is suppressed to an extent dependent on the activity of the antioxidant and the color intensity is decreased proportionally. TroloxTM, a water-soluble vitamin E analogue, serves as a standard or a control antioxidant.

1 Kit sufficient for 200 tests

Cell Cycle

SENESCENT CELLS STAINING KIT

Prod. No. CS0030-1KT	Cat. Price 194,00 €	Special Price 155,00 €
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Replicative senescence is a growth-arrest state associated with loss of division potential, changes in cell morphology, shape and physical appearance, and the pattern of gene expression in cells. Histochemical staining of β -galactosidase activity is performed at pH 6.0. Under these conditions, β -galactosidase is a biomarker specific for senescent cells, but is not found in quiescent, immortal, or tumor cells.

1Kit sufficient for 100 tests

Cyclic Nucleotides

DIRECT cAMP ENZYME IMMUNOASSAY KIT

Prod. No. CA200-1KT	Cat. Price 556,00 €	Special Price 445,00 €
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Non-radioactive, competitive immunoassay for the quantitation of total cAMP in tissue and cell cultures. Buffer contains 0.1 N HCl that aids in the lysis of cells, inhibits endogenous phosphodiesterases and stabilizes the cyclic nucleotides. This kit uses a polyclonal antibody to cAMP to competitively bind cAMP or cAMP which has been covalently linked to an alkaline phosphatase molecule. The assay is performed in a 96 well plate coated with anti-rabbit IgG antibody. The colored end product, produced by the addition of substrate to the wells, is read at 405 nm on a multiwell plate reader. The intensity of the color is inversely proportional to the concentration of cAMP present in the well.

1 Kit sufficient for 96 assays

Cyclic Nucleotides

DIRECT cGMP ENZYME IMMUNOASSAY KIT

Prod. No. CG200-1KT	Cat. Price 556,00 €	Special Price 445,00 €
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This kit uses a polyclonal antibody to cGMP to competitively bind cGMP or cGMP that has been covalently linked to an alkaline phosphatase molecule. The assay is performed in a 96 well plate coated with anti-rabbit IgG antibody. The colored end product, produced by the addition of substrate to the wells, is read at 405 nm on a multiwell plate reader. The intensity of the color is inversely proportional to the concentration of cGMP present in the well. Non-radioactive, competitive immunoassay for the quantitation of total cGMP in tissue and cell cultures. Buffer contains 0.1N HCl that aids in the lysis of cells, inhibits endogenous phosphodiesterases and stabilizes the cyclic nucleotides.

1Kit sufficient for 96 assays

Cytoskeleton & Extracellular Matrix

CHITINASE ASSAY KIT, FLUOROMETRIC

Prod. No. CS1030-1KT	Cat. Price 397,50 €	Special Price 318,00 €
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The kit assay is based on the enzymatic hydrolysis of chitinase substrates. This enzymatic hydrolysis releases 4-methylumbelliferone (4MU), which upon ionization in basic pH, can be measured fluorimetrically at an excitation wavelength of 360 nm and an emission wavelength of 450 nm. The use of fluorimetric substrates provides a very sensitive detection system. The Chitinase Assay Kit provides all the reagents required for efficient and sensitive detection of chitinase activity in fungal and bacterial growth media, macrophage lysates, and purified enzyme preparations. In addition, the kit provides three different substrates for the detection of the various types of the chitinolytic activity:

- 4-Methylumbelliferyl N,N'-diacetyl-β-D-chitobioside – substrate suitable for exochitinase activity detection (chitobiosidase activity)
- 4-Methylumbelliferyl N-acetyl-β-D-glucosaminide – substrate suitable for exochitinase activity detection (β-N-acetylglucosaminidase activity)
- 4-Methylumbelliferyl β-D-N,N''-triacetylchitotriose - substrate suitable for endochitinase activity detection.

Chitinase catalyzes the hydrolytic cleavage of the β-1-4-glycoside bond present in biopolymers of N-acetylglucosamine, primarily in chitin. Chitinases are widely distributed in living organisms and are found in fungi, bacteria, parasites, plants, and animals. They are classified in families based on amino acid sequence similarities.

The chitinolytic enzymes are also categorized based on their enzymatic action on chitin substrates. Endochitinases are defined as the enzymes catalyzing the random cleavage at internal points in the chitin chain. Exochitinases catalyze the progressive release of acetylchitobiose or N-acetylglucosamine from the non-reducing end of chitin, and are referred to as chitobiosidase and β-N-acetylglucosaminidase, respectively.

Chitinases perform different functions in different organisms. In bacteria, they are mainly involved in nutritional processes. In yeast and various fungi, these enzymes participate in morphogenesis. In animals and plants, chitinases primarily play a role in the defense of the organism against pathogen attack.

1 Kit sufficient for 200 multiwell tests

Gene Regulation & Expression

SIRT1 ASSAY KIT

Prod. No. CS1040-1KT	Cat. Price 382,00 €	Special Price 306,00 €
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The assay procedure is based on a two-step enzymatic reaction. The first step is deacetylation by SIRT1 of a substrate that contains an acetylated lysine side chain. The second step is the cleavage of the deacetylated substrate by the Developing Solution and the release of a highly fluorescent group. The measured fluorescence is directly proportional to the deacetylation activity of the enzyme in the sample. Sirtuins (Sir2) are an evolutionarily conserved family of NAD⁺ dependent histone/protein deacetylases that tightly couple the cleavage of NAD⁺ and the deacetylation of protein substrates. The reaction products are nicotinamide, the deacetylated product, and a novel metabolite, 2'-O-acetyl-ADP-ribose. The proteins within this family are named after the first protein discovered from this family, Sir2 (Silent Information Regulator 2). Besides gene silencing, sirtuin proteins are important in other processes such as cell cycling regulation and fatty acid metabolism. SIRT1 is the human homolog of Sir2 and the one most studied to date. SIRT1 mediates p53 dependent process, transcription regulation, muscle differentiation, adipogenesis, and protection from axonal degeneration. SIRT1 also participates in early embryogenesis, neurogenesis, and cardiogenesis. The kit offers all the reagents required for the fast and easy measurement of purified SIRT1 activity and for screening of inhibitors/activators. Moreover, the kit contains an inhibitor (nicotinamide) and an activator (resveratrol) as negative and positive controls, respectively.

1 Kit sufficient for 100 assays

Gene Regulation & Expression

NUCLEI ISOLATION KIT: NUCLEI EZ PREP

Prod. No. NUC101-1KT	Cat. Price 176,00 €	Special Price 141,00 €
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For rapid isolation of nuclei from mammalian cells. The protocol provides a high yield of nuclei from commonly used mammalian cells, including both adherent (e.g., HEK293 and COS7) and non-adherent (e.g., Jurkat and HFN7.1) cell lines and peripheral blood mononuclear cells (PBMCs). The preparations are suitable for many cell biology applications, e.g., as a source of nuclear components such as chromatin, genomic DNA, histones and nuclear RNA/RNP, produces nuclei for in vitro apoptosis assays, and functional studies such as examination of the transcriptional status of cells. Sufficient for 25 nuclei preparations (~1-10×10⁷ cells/preparation)

Kinase Assays

P38 MAPK ACTIVITY ASSAY KIT

Prod. No. CS0250-1KT	Cat. Price 658,00 €	Special Price 526,00 €
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The mitogen-activated protein kinase (MAPK) p38 pathway is a signaling cascade activated by proinflammatory stimuli and cellular stresses, playing a critical role in the translational regulation of proinflammatory cytokine synthesis. The p38 MAPK Assay Kit provides an easy method to assay p38 MAPK activity and explore new p38MAPK stimuli, inhibitors, and activators. The kit provides all the reagents required for the straightforward detection and measurement of p38 MAPK activity in cell lysates, tissue homogenates, column fractions, or the purified enzyme. In addition, the kit provides a specific p38 MAPK inhibitor to enable the verification of the specificity of the kinase activity observed.

The assay is based on immunoprecipitation of the active form of p38α kinase and detection of its phosphorylation activity on the substrate ATF2 by immunoblotting, without the need for a secondary antibody. An alternative protocol for radioactive measurement of p38 MAPK activity is also provided.

1 Kit sufficient for 50 determinations

Nitric Oxide Metabolism

SUPEROXIDE ANION ASSAY KIT

Prod. No. CS1000-1KT	Cat. Price 454,00 €	Special Price 563,00 €
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The kit method is based on the oxidation of luminol by superoxide anions resulting in the formation of chemiluminescence light. This method utilizes a specific, non-toxic enhancer that amplifies the chemiluminescent signal. The Superoxide Anion assay kit provides a useful qualitative cell-based assay for the measurement of O₂^{•-} anion status in cells. The kit can be used to test changes in superoxide anion levels following oxidative stress directly in whole cells. In addition, the kit can be also used for the detection of superoxide dismutase (SOD) activity. This activity was tested on erythrocytes, leucocytes, and plasma. The superoxide anion (O₂^{•-}) is a short-lived radical generated by the addition of an electron to oxygen. It is formed in response to environmental factors such as UV light, cigarette smoke, environmental pollutants, and γ-radiation, or by oxidases like xanthine oxidase or NADPH oxidase. Once formed, O₂^{•-} attacks cellular components causing damage to lipids, proteins, and DNA. This can initiate numerous diseases, including cancer, atherosclerosis, rheumatoid arthritis, diabetes, liver damage, and central nervous system disorders.

1 Kit sufficient for 100 assays (96 well plates)

PKH and CellVue® Claret Fluorescent Cell Linker Kits

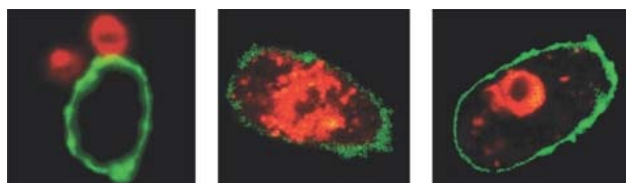
PKH and CellVue® Fluorescent Cell Linker Kits provide fluorescent labeling of live cells over an extended period of time, with no apparent toxic effects. Fluorescent linker kits are effective for a variety of cell types and exhibit no significant leaking, or transfer from cell to cell. They provide stable, clear, intense, accurate and reproducible fluorescent labeling of cells. Patented cell linker technology incorporates aliphatic reporter molecules into the cell membrane lipid bilayer by selective partitioning.

Four fluorescent linkers are available. PKH2 and PKH67 are green fluorochromes with excitation (490 nm) and emission (504 nm) similar to fluorescein, while PKH26 is a red fluorochrome, has excitation (551 nm) and emission (567 nm) characteristics compatible with rhodamine or phycoerythrin detection systems. PKH26 may also be excited by the 488 nm emission of an argon-ion laser. CellVue® Claret is a far-red fluorochrome which is independent of pH in physiologic ranges, and has excitation (655 nm) and emission (675 nm) characteristics compatible with a red diode laser. The linkers are physiologically stable and show little to no toxic side-effects on cell systems. Labeled cells retain both biological and proliferative activity, and are ideal for cell tracking and cell-cell interaction studies.

Due to the non-specific labeling mechanism of the cell linkers, a wide variety of cell types have been labeled successfully. The linkers have been applied to both animal and plant cells as well as other membrane containing particles. The pattern of staining is dependent upon the cell type being labeled and the membrane of the cells. Although most applications center around general labeling (GL) methods involving membrane incorporation of the probes, the linkers may also be used for selective phagocytic cell labeling (PCL). Appearance of labeled cells may vary from bright "immunofluorescence" labeling to a punctate or patchy appearance. Since the labeling is not a saturation reaction, but rather a function of both dye and cell concentration, it is essential that the amount of dye available for incorporation be limited. Overlabeling of the cells will result in loss of membrane integrity and cell recovery.

Features

- Fluorescent labeling of **live** cells
- Stable for up to 100 days on live cells *in vivo*
- Intense and easy-to-use
- Non-cytotoxic - no effect on biological or proliferative activity
- Versatile - labels various eukaryotic cells and cell lines, bacteria, and parasites
- Uniform and reproducible
- No significant dye leakage or transfer from cell to cell
- Different dyes permit multi-color analysis
- Compatible with other fluorescent labels
- Technology that works, with hundreds of literature references to prove it



Confocal Assay for Phagocytosis using PKH labeling

CellVue® Claret Far Red Fluorescent Cell Linker MIDI Kit

Prod. No.	Cat. Price	Special Price
MIDCLARET-1KT	227,00 €	193,00 €

CellVue Claret kit fluoresces in the far red and may be used for general cell membrane labeling including *in vitro* cell labeling, *in vitro* lymphocyte proliferation studies, *in vivo* cytotoxicity assays, and also as a second color for monitoring cell-cell membrane transfer. The CellVue Claret Fluorescent Cell Linker kit uses a proprietary membrane labeling technology to stably incorporate a far red fluorescent dye with long aliphatic tails (CellVue Claret) into lipid regions of the cell membrane.

Kit contains CellVue® Claret Dye 2x0.1 mL

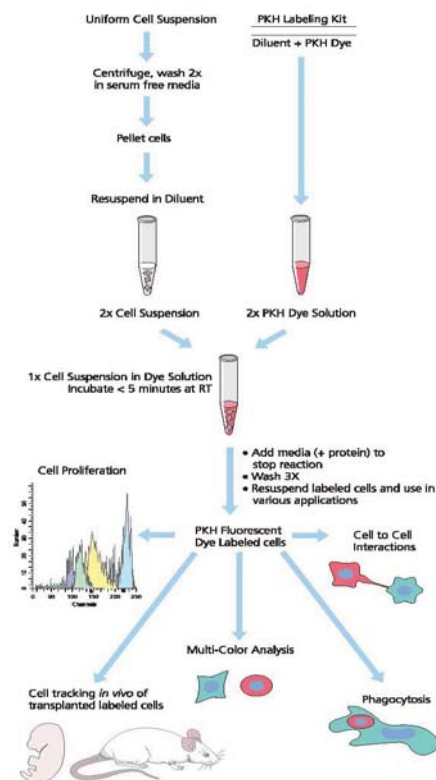
CellVue® Claret Far Red Fluorescent Cell Linker MINI Kit

Prod. No.	Cat. Price	Special Price
MINCLARET-1KT	135,00 €	115,00 €

CellVue Claret kit fluoresces in the far red and may be used for general cell membrane labeling including *in vitro* cell labeling, *in vitro* lymphocyte proliferation studies, *in vivo* cytotoxicity assays, and also as a second color for monitoring cell-cell membrane transfer. The CellVue Claret Fluorescent Cell Linker kit uses a proprietary membrane labeling technology to stably incorporate a far red fluorescent dye with long aliphatic tails (CellVue Claret) into lipid regions of the cell membrane.

Kit contains CellVue® Claret Dye 0.1 mL

Standard Protocol for PKH labeling with Sigma Kits:



For additional technical details on Fluorescent Cell Linker Dyes including a comprehensive bibliography, please visit www.sigma-aldrich.com/pkh

PKH2 Green Fluorescent Cell Linker Kit for General Cell Membrane Labeling

Prod. No. PKH2GL	Cat. Price 654,00 €	Special Price 556,00 €
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This kit is for general cell membrane labeling. It has been characterized in a number of model systems and has been found to be useful for *in vitro* cell labeling, *in vitro* proliferation studies and short term, *in vivo* cell tracking. The half-life for elution of PKH2 from labeled rabbit red blood cells is 10-11 days. This slow elution may complicate interpretation of experiments assessing *in vivo* proliferation.

PKH67 Green Fluorescent Cell Linker Kit for General Cell Membrane Labeling

Prod. No. PKH67GL	Cat. Price 772,00 €	Special Price 656,00 €
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This kit is for general cell membrane labeling. PKH67 has a longer aliphatic carbon tail than PKH1 and PKH2, two other green dyes previously described for *in vitro* and *in vivo* cell tracking. Based on the longer tail length, in-house studies have consistently shown reduced cell-cell transfer for PKH67 as compared to PKH2.

Slow loss of fluorescence has been observed in *in vivo* studies using PKH1 and PKH2. PKH67 may exhibit similar properties since this behavior appears to be characteristic of green cell linker dyes, but not red cell linker dyes. Correlation of *in vitro* cell membrane retention with *in vivo* fluorescence half life in non-dividing cells predicts an *in vivo* fluorescence half life of 10-12 days for PKH67. Other green cell linker dyes with similar half lives have been used to monitor *in vivo* lymphocyte and macrophage trafficking over periods of 1-2 months, suggesting that PKH67 will also be useful for *in vivo* tracking studies of moderate length.

PKH26 Red Fluorescent Cell Linker Kit for General Cell Membrane Labeling

Prod. No. PKH26GL	Cat. Price 772,00 €	Special Price 656,00 €
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This kit is for general cell membrane labeling. It has been characterized in a number of model systems and has been found to be useful for *in vitro* cell labeling, *in vitro* proliferation studies and long term, *in vivo* cell tracking. The half-life for elution of PKH26 from labeled rabbit red blood cells is greater than 100 days. This enhanced stability is favorable for long term *in vivo* studies.

PKH26 Red Fluorescent Cell Linker Mini Kit for General Cell Membrane Labeling

Prod. No. MINI26	Cat. Price 236,50 €	Special Price 201,00 €
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This kit is for general cell membrane labeling, including for *in vitro* cell labeling, *in vitro* proliferation studies, and long term *in vivo* cell tracking.

PKH67 Green Fluorescent Cell Linker Midi Kit for General Cell Membrane Labeling

Prod. No. MIDI67	Cat. Price 219,50 €	Special Price 187,00 €
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This kit is for general cell membrane labeling. PKH67 has a longer aliphatic carbon tail than PKH1 and PKH2, two other green dyes previously described for *in vitro* and *in vivo* cell tracking. Based on the longer tail length, in-house studies have consistently shown reduced cell-cell transfer for PKH67 as compared to PKH2.

Slow loss of fluorescence has been observed in *in vivo* studies using PKH1 and PKH2. PKH67 may exhibit similar properties since this behavior appears to be characteristic of green cell linker dyes, but not red cell linker dyes.

Correlation of *in vitro* cell membrane retention with *in vivo* fluorescence half life in non-dividing cells predicts an *in vivo* fluorescence half life of 10-12 days for PKH67. Other green cell linker dyes with similar half lives have been used to monitor *in vivo* lymphocyte and macrophage trafficking over periods of 1-2 months, suggesting that PKH67 will also be useful for *in vivo* tracking studies of moderate length.

PKH67 Green Fluorescent Cell Linker Mini Kit for General Cell Membrane Labeling

Prod. No. MINI67	Cat. Price 225,00 €	Special Price 191,00 €
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Slow loss of fluorescence has been observed in *in vivo* studies using PKH1 and PKH2. PKH67 may exhibit similar properties since this behavior appears to be characteristic of green cell linker dyes, but not red cell linker dyes. Correlation of *in vitro* cell membrane retention with *in vivo* fluorescence half life in non-dividing cells predicts an *in vivo* fluorescence half life of 10-12 days for PKH67. Other green cell linker dyes with similar half lives have been used to monitor *in vivo* lymphocyte and macrophage trafficking over periods of 1-2 months, suggesting that PKH67 will also be useful for *in vivo* tracking studies of moderate length.

PKH2 Green Fluorescent Cell Linker Kit for Phagocytic Cell Labeling

Prod. No. PKH2PCL	Cat. Price 649,00 €	Special Price 552,00 €
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The labeling occurs through the formation of dye aggregates or particulates. The aggregate formation significantly inhibits the uptake of dye by non-phagocytic cells, such as lymphocytes, but facilitates dye uptake by phagocytic cells. Labeled cells appear patchy or spotted because the dye is localized in phagocytic compartments of the cells. The dye appears to be resistant to metabolic attack and has been found to remain with the cells for more than 21 days *in vivo*. Intraperitoneal or intravenous injections of the PKH2 labeling solution will successfully label phagocytic cells *in vivo*, while cells of interest which have been isolated may be stained using *in vitro* labeling methods.

PKH26 Red Fluorescent Cell Linker Kit for Phagocytic Cell Labeling

Prod. No. PKH26PCL	Cat. Price 772,00 €	Special Price 656,00 €
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This kit is for phagocytic cell labeling. It is used to selectively label cells with phagocytic capabilities such as monocytes, macrophages or neutrophils. The labeling occurs through the formation of dye aggregates or particulates. The aggregate formation significantly inhibits the uptake of dye by non-phagocytic cells, such as lymphocytes, but facilitates dye uptake by phagocytic cells. Labeled cells appear patchy or spotted because the dye is localized in phagocytic compartments of the cells. The dye appears to be resistant to metabolic attack and has been found to remain with the cells for at least 21 days *in vivo*.

Labeling of phagocytic cells by this methodology may be conducted either *in vitro* or *in vivo*. Intraperitoneal or intravenous injections of the PKH26 labeling solution will successfully label phagocytic cells *in vivo*, while cells of interest which have been isolated may be stained using *in vitro* labeling methods.

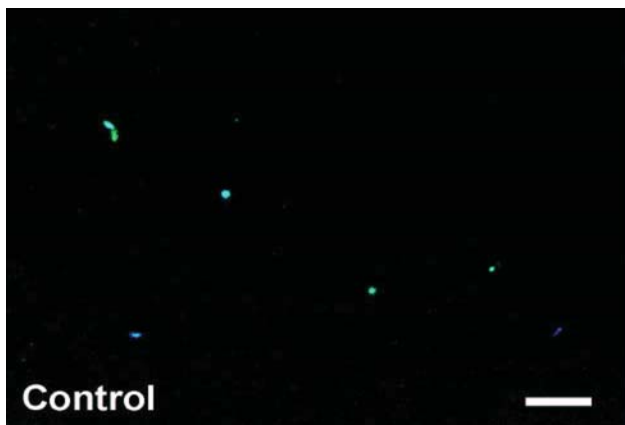
New Solutions for Apoptosis Research: Apo-TRACE™ Kits

Apo-TRACE®, Apoptotic Cell Staining Kit

Prod. No. CS1110-1KT	Cat. Price 284,00 €	Special Price 227,00 €
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Apo-TRACE, Apoptotic Cell Staining Kit is designed to be used for the detection of apoptotic cells after apoptosis induction by observing the accumulation of Apo-TRACE in the cytoplasm of the apoptotic cells. Apo-TRACE staining can be visualized under a fluorescence microscope or alternatively, the molecule can be extracted from the cells for a quantitative evaluation. Apo-TRACE stained apoptotic cells can be separated from the rest of the cells using flow cytometry. A propidium iodide (PI) solution is supplied with the kit to enable staining of non-viable cells. Propidium iodide binds to double-stranded DNA, but it can only cross the plasma membrane of non-viable cells. Thus, a double staining (Apo-TRACE and PI) allows distinguishing between apoptotic and non-viable cells. The kit was tested on various cell lines (i.e., Jurkat, HeLa, C26, Balb/3T3, CHO, and A-431) using various apoptosis inducers (i.e., anti-Fas antibody, BCNU, and Staurosporine).

Apoptosis, a form of programmed cell death, is a biological process important in normal development as well as pathological states. Apo-TRACE is a small, non-toxic, organic molecule, which is a member of the ApoSense® family of low molecular weight compounds suitable for imaging cell death in vivo as well as in vitro.1,2 The ApoSense compounds respond to alterations in plasma membrane potential and phospholipid scrambling, which are hallmarks of apoptotic cells. Apo-TRACE has inherent fluorescent properties (excitation at 328 nm and emission at 563 nm) and accumulates in the cytoplasm of apoptotic cells. Sufficient for 350 assays



Example:
Apo-TRACE detection of induced apoptosis in mice bearing C26 colon carcinoma.

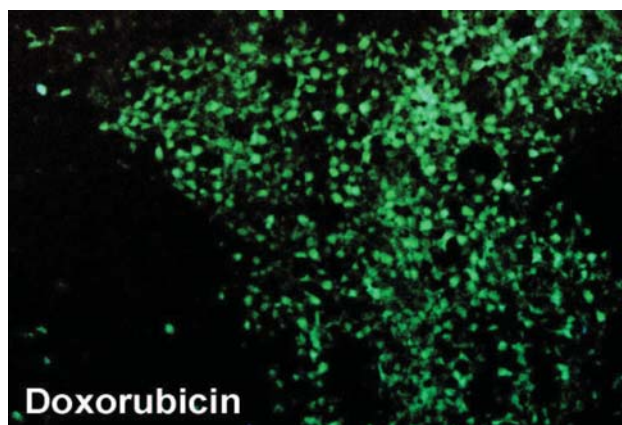
Apo-TRACE® In Vivo Apoptosis Detection Kit

Prod. No. CS1120-1KT	Cat. Price 331,50 €	Special Price 265,00 €
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Apo-TRACE In Vivo Apoptosis Detection Kit is designed for in vivo apoptotic cell staining and quantitative analysis of Apo-TRACE accumulation. Apo-TRACE uptake into apoptotic cells can be evaluated quantitatively by measuring the level of accumulation of the fluorescent dye within the cells of the organ or tissue. The detection of apoptosis by fluorescent methods depends on the labeling efficiency, which varies among cell/tissue types, cell number, or tissue weight, and the sensitivity of the detection instrument used.

Apoptosis, a form of programmed cell death, is a biological process important in normal development as well as pathological states. Apo-TRACE is a small, non-toxic, organic molecule, which is a member of the ApoSense™ family of low molecular weight compounds used for imaging cell death in vivo. The ApoSense compounds respond to alterations in plasma membrane potential and phospholipid scrambling, which are hallmarks of apoptotic cells. Upon systemic administration, the compounds can mark apoptotic cells from the early stages of cell death.1,2,3 The Apo-TRACE compound has inherent fluorescent properties (excitation at 328 nm and emission at 563 nm) and accumulates in the cytoplasm of apoptotic cells in the living body. Since most anticancer treatments act by inducing apoptosis, staining with Apo-TRACE can give a good indication for the efficiency of the treatment.

Sufficient for 25 injections



The extent of green fluorescence and intensity of Apo-TRACE accumulation in apoptotic foci represents the increased cell death induced by doxorubicin.

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