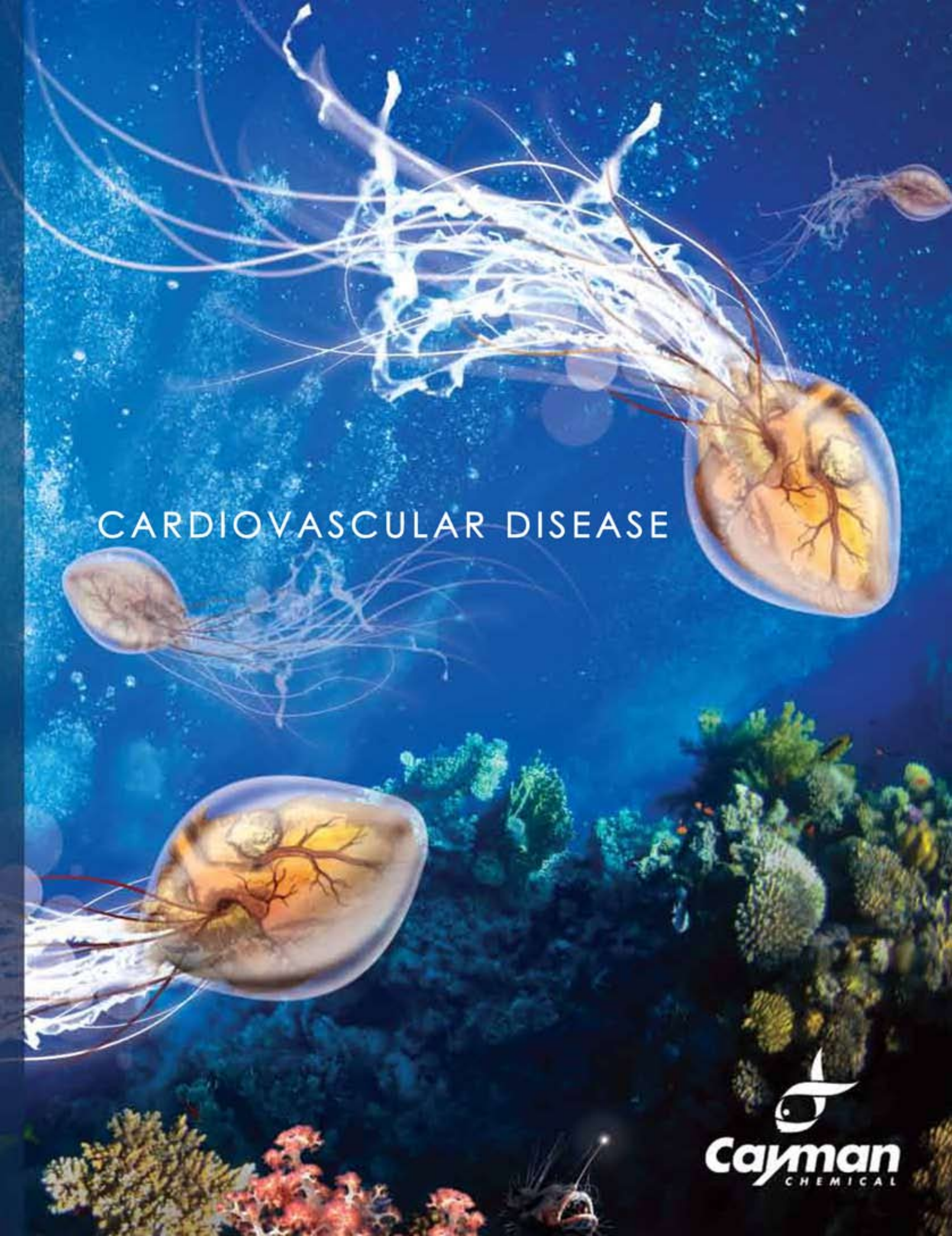
CARDIOVASCULAR DISEASE
Cayman
CHEMICAL

Thomas G. Brock, Ph.D..

Introduction to

Cardiovascular Disease

Of course, we've taken liberties on the cover: jellyfish don't have hearts. The surface of the bell-shaped body is used for gas exchange, so even respiratory and vascular systems are unneeded. Digestion involves only a simple cavity, lined with a gastrodermis, for both food intake and waste expulsion. Some jellyfish move by contracting muscles that line the bell, expelling water and propelling the body forward. For these jellies, such movement is largely for repositioning in the water column, guided by rudimentary sensors for light and gravity. However, the box jellyfish, of the class *Cubozoa*, is another beast altogether. These hunters have an umbrella-shaped body with true eyes, complete with retinas, corneas, and lenses. Improved vision, combined with neural and structural modifications of the body, allows rapid, directional (and, presumably, intentional) movement. Perhaps most importantly, box jellyfish tentacles are studded with cells containing barbed, pressurized nematocysts that inject venom into the victim. The venom of the most dangerous box jelly, *Chironex fleckeri*, has dermonecrotic, myotoxic, cardiotoxic, hemodynamic, and hemolytic effects. Envenomation, particularly in smaller children, can be lethal. More commonly, symptoms include severe localized pain, marked redness of the skin, and collapse due to respiratory failure or cardiac arrest.

Compared to an encounter with a *Chironex*, cardiovascular disease might seem relatively mild. However, statistics from the American Heart Association indicate that in 2006, 6,161,000 Americans were discharged from short hospital stays with a first listed diagnosis of cardiovascular disease. Roughly 40% of men and women in the 40 to 59 year old age group have cardiovascular disease. This increases to 73% percent of men and women in the 60-79 year old age group. For both men and women, black, white, or Asian, cardiovascular diseases caused more deaths than cancer in 2006. More than 800,000 people died from cardiovascular diseases in the United States in 2006, while some 70 people have died from *Chironex* poisoning in recorded history.

The statistics on deaths due to cardiovascular disease are startling, but the overall cost, in terms of treatment and diminished quality of life, must be staggering. Cayman is dedicated to helping make research possible, by making quality reagents available at affordable prices. Our product line extends well beyond the contents of this topical catalog. Please look at our website, caymanchem.com, or call us to find out how we can work together to understand cardiovascular disease.

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Cd

CARDIOVASCULAR DISEASE

warranty and limitation of remedy

ordering information

Ordering Information
Orders are accepted by telephone, fax, mail, e-mail, or *via* the Cayman Chemical website. We will accept telephone orders Monday through Friday from 8 AM to 6 PM EST. All orders received by 1 PM EST will be shipped the same day if stock is available (Monday through Thursday only). Confirming purchase orders must be clearly marked as such to avoid possibility of duplication.

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In most instances we ship FedEx Standard Overnight Delivery (not available to all locations), with delivery by 3:30 PM of the next business day. Product availability may vary. Local delivery is available for the Ann Arbor area only. Other shipping options will be considered upon request, but can be granted only under conditions that will ensure the quality of the product. Freight is prepaid and added to the invoice. Please inquire at the time of order for an estimate of the freight charges. If you wish us to ship collect, please supply a valid account number when ordering. Please address all orders to:

Cayman Chemical Company
1180 E. Ellsworth Road
Ann Arbor, MI 48108 USA
Phone: (734) 971-3335

Toll-free Phone: (800) 364-9897
Fax: (734) 971-3640
E-mail: custserv@caymanchem.com
www.caymanchem.com

Include the following information with your order:
1. Catalog number, description, size, and quantity desired.
2. Complete shipping address. (Delivery is not available to post office box numbers.)
3. A complete billing address.
4. A purchase order number or major credit card (Visa, MasterCard, or American Express), account number, and expiration date.
5. Name of the end user.

Terms
1. U.S. funds only, drawn on a U.S. bank.
2. Net 30 days.
3. F.O.B. Ann Arbor, Michigan, U.S.A.
4. Bank fees and wire transfer fees are not to be deducted from the invoice amount.

Prices
All prices listed are in U.S. dollars. The prices in this catalog are effective as of May 1, 2011. Prices are subject to change without notice.

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Products cannot be returned without prior authorization from Cayman Chemical Company. Please contact our Customer Service Department for return shipping instructions. Custom orders and radioactive material cannot be accepted for return credit if due to a customer's error.

Technical Assistance
Technical assistance is available from 8 AM to 5:30 PM EST. If inquiring about a purchased product, please provide the catalog number, lot number, and date of purchase to our technical staff so they may answer your questions quickly. Technical assistance may be reached toll free at 888-526-5351, *via* e-mail at techserv@caymanchem.com, or on the web at www.caymanchem.com/techserv.

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Patent Disclaimer
The end-user assumes full responsibility for appropriate licensing and/or non-infringement for any proprietary claim or patent.

NOTE: For Laboratory Research Use Only. Not for human or veterinary diagnostic or therapeutic use.

abbreviations

ACAT	Acyl-coenzyme A:Cholesterol Acyltransferase
ACE	Angiotension-Converting Enzyme
ADHP	10-Acetyl-3,7-Dihydroxyphenoxazine
ADP	Adenosine Diphosphate
AEA	Arachidonoyl Ethanolamide; Anandamide
Apo	Apolipoprotein
ApoAI	Apolipoprotein AI
ATP	Adenosine Triphosphate
BGD	β-Glucosidase
cAMP	Adenosine 3′, 5′-Cyclic Monophosphate
Cdk	Cyclin-Dependent Kinase
cGMP	Guanosine 3′,5′-cyclic monophosphate
CK	Casein Kinase
CNS	Central Nervous System
CoA	Coenzyme A
COX	Cyclooxygenase
CREB	cAMP Response Element Binding Protein
CYP	Cytochrome P
DTNB	5,5′-Dithio-bis-(2-nitrobenzoic acid); Ellman's Reagent
DTT	Dithiothreito
DGAT	Diglyceride Acyltransferase
DIO	Diet Induced Obesity
DNA	Deoxyribonucleic Acid
DMSO	Dimethyl Sulfoxide
EDTA	Ethylenediaminetetraacetic Acid
EET	Epoxyeicosatrienoic Acid
EGFR	Epidermal Growth Factor Receptor
EIA	Enzyme Immunoassay
ELISA	Enzyme-Linked Immunosorbent Assay
EP	Prostaglandin E Receptor
EPA	Eicosapentaenoic Acid
ER	Estrogen Receptor Endoplasmic Reticulum
ERK	Extracellular Signal-Regulated Kinase
FABP	Fatty Acid Binding Protein
FC	Flow Cytometry
FITC	Fluorescein Isothiocyanate
FRET	Fluorescent Resonant Energy Transfer
FXR	Farnesoid X Receptor
GC	Gas Chromatography
GCS	glucosylceramide synthase
GPCR	G Protein-Coupled Receptors
GSK	Glycogen Synthase Kinase
GST	Glutathione-S-Transferase
GTP	Guanosine Triphosphate
HAT	Histone Acetyltransferase
HDAC	Histone Deacetylases
HDL	High-Density Lipoprotein
HIF	Hypoxia Inducible Factor
His	Hexahistidine
HMG	3-Hydroxy-3-Methyl-Glutaryl
HMT	Histone methyltransferases
HRP	Horseradish Peroxidase
Hsp	Heat-Shock Protein
ICC	Immunocytochemistry
IF	Immunofluorescence
IHC	Immunohistochemistry
IL	Interleukin
IP	Prostaglandin I_2 Receptor
KLH	Keyhole Limpet Hemocyanin
LBD	Ligand Binding Domain
LC-MS	Liquid Chromatography-Mass Spectrometry
LDL	Low-Density Lipoprotein
LO	Lipoxygenase
LPA	Lysophosphatidic Acid
LPS	Lipopolysaccharide
LSD	Lysine-Specific Demethylase
LT	Leukotriene
LXR	Liver X Receptor
MAPK	Mitogen Activated Protein Kinase
MBD	Methyl binding domain
MHC	Myosin Heavy Chain
MMP	Matrix Metalloproteinase
MS	Mass Spectrometry
NADPH	Nicotinamide Adenine Dinucleotide Phosphate
NOS	Nitric Oxide Synthase
oxLDL	Oxidized Low-Density Lipoprotein
PAF	Platelet-activating Factor
PAF-AH	Platelet-activatingFactor Acetylhydrolase
PBS	Phosphate Buffered Saline
PE	Phycoerythrin
PG	Prostaglandin
PGES	Prostaglandin E Synthase
PGIS	Prostaglandin I Synthase
PI3K	Phosphoinositide 3-Kinase
PKA	Protein Kinase A
PL	Phospholipase
PP	Protein Phosphatase
PPAR	Peroxisome Proliferator-activated Receptor
PRMT	Protein Arginine Methyltransferases
PRP	Platelet-rich Plasma
PUFA	Polyunsaturated Fatty Acid
RNA	Ribonucleic Acid
RTK	Receptor tyrosine kinases
SAMe	S-Adenosyl-L-Methionine
sEH	Soluble Epoxide Hydrolase
sGC	Soluble Guanylate Cyclase
SIP	Sphingosine-1-Phosphate
SIRT	Silent Information Regulator
SPHK	Sphingosine Kinase
SREBP	Sterol Regulatory Element-Binding Protein
TG	Triglyceride
TNF-α	Tumor Necrosis Factor-α
TP	T Prostanoid Receptor
TX	Thromboxane
VEGF	Vascular Endothelial Growth Factor
WB	Western Blot

vol. 12 Cd

Thomas G. Brock, Ph.D.

Cardiovascular Disease, Pulmonary Hypertension, and Prostacyclins

The term 'cardiovascular disease' can be confusing. Commonly, it centers on atherosclerosis, focusing on cholesterol levels, plaque formation, and the narrowing and hardening of the arteries. From here, it is necessarily linked to the other diseases that lead to and result from these changes, including hypercholesterolemia, diabetes, hypertension, and stroke. This broadens the scope of the relevant pathophysiology tremendously. Atherosclerosis can be further linked with metabolic syndrome, which is not so much a disease as a group of risk factors (obesity, insulin resistance, aging, genetic predisposition) that increase the risk for coronary artery disease, stroke, and type 2 diabetes. Cardiovascular disease, in this broad sense then, is not so much a single disease as an extensive web of interconnected diseases.

A different approach is given by the International Classification of Diseases (ICD), maintained by the World Health Organization. Originally called the International List of Causes of Death, it was created in the 1850s to standardize the classification of causes of morbidity worldwide. Now in its tenth revision, the ICD codes over 14,000 diseases, symptoms, complaints, social circumstances, and external causes of injury or diseases. These are divided into 22 broad categories, including the diseases of the circulatory system. Circulatory system diseases span several hundred subcategories, ranging from ischemic, rheumatic, and pulmonary heart diseases to diseases of veins and arteries to subcerebral hemorrhage and stroke. In this system of classification, several types of atherosclerosis are categorized within the Diseases of Arteries, Arterioles, and Capillaries. According to ICD-10, then, the diseases of the cardiovascular system can be neatly divided into numerous diverse and relatively distinct entities.

Pulmonary Hypertension

Hypertension is an important topic under both approaches. Hypertension is simply the technical term for high blood pressure. Blood pressure is affected, physiologically, by such factors as water and salt content, condition of kidneys, nervous system, or blood vessels, and hormone levels. Hypertension is a risk factor for severe adverse events, such as heart attack, stroke, heart failure, kidney disease, and early death. Pulmonary hypertension is specifically an increase in blood pressure in the lung vasculature and is characterized, physiologically, by dyspnea (shortness of breath), dizziness, and fainting. The right ventricle of the heart pumps blood through the lungs, where it can receive oxygen (Figure 1). When the small vessels within the lungs become narrow, the resistance to blood flow through the lungs increases, raising pulmonary blood pressure. If the narrowing is due to non-inflammatory processes, then it is called pulmonary hypertension. Because the heart works harder to move blood through the narrowed vessels, the right ventricle may become enlarged. Persistent pulmonary hypertension inevitably leads to heart failure.

A decade or more ago, pulmonary hypertension was divided into primary (essential) pulmonary hypertension, which by definition was idiopathic, and hypertension that was secondary to, commonly, other cardiac or pulmonary disorders. More recently, pulmonary hypertension has been further classified, by the World Health Organization, into five types, including arterial, venous, hypoxic, thromboembolic, and miscellaneous. Pulmonary arterial hypertension (PAH) is characterized by abnormally high blood pressure in the pulmonary artery, the blood vessel that carries blood from the heart to the lungs (Figure 1).

Lipid Mediators in Pulmonary Hypertension

In the older literature, primary pulmonary hypertension (PPH) was reported to be commonly associated with lipid mediator dysregulation.[1] An overabundance of thromboxanes during PPH was described as indicative of persistent platelet activation, while an underproduction of PGI_2 indicated

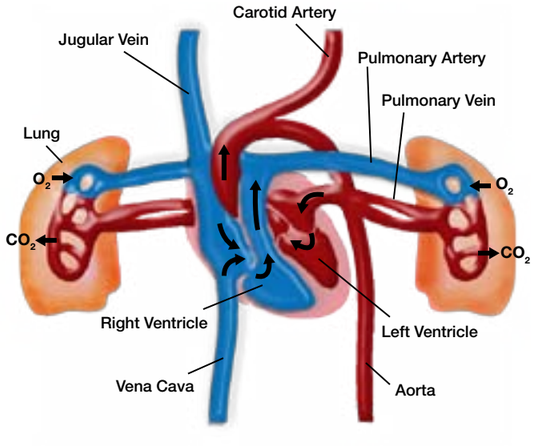

Figure 1. Deoxygenated blood returning to the heart is pumped through the right ventricle to the lungs. The smallest vessels of the lungs, which are crucial for gas exchange, are key points of resistance to blood flow and modulate pulmonary blood pressure.

an inadequate endothelial response. In addition, PPH often featured an increase in PGD_2, indicating activation of tissue macrophages. In terms of the newer disease classification, these changes are featured primarily in PAH. Analogs of PGI_2 are effective, either alone or in combination therapy, in the treatment of pulmonary hypertension (PPH or PAH).[2,3] In part, this results from their ability to relax pulmonary arterial smooth muscle. Moreover, PGI_2 and its analogs may also suppress the overproduction of thromboxane and PGD_2, since they can potently inhibit macrophage function, including their production of inflammatory mediators.[4]

The synthesis of PGI_2 from arachidonic acid is initiated by the cyclooxygenases, COX-1 and COX-2 (Figure 2). Both enzymes are membrane-bound homodimers, found predominantly on the perinuclear membranes. COX-1 is commonly described as ubiquitous and constitutively expressed. COX-2, on the other hand, is normally absent from most cell types, its expression is induced by inflammatory mediators like TNF-α and IL-1β, and both its mRNA and protein have short half-lives. Both COX isoforms produce the intermediate PGH_2, which is then converted to the final prostanoid products by specific, terminal enzymes. For example, PGH_2 is isomerized to PGI_2 by PGIS (also known as CYP8A1), a single-pass membrane-bound protein that is abundant in endothelium, ovary, heart, skeletal muscle, lung, and prostate. While the expression of PGIS is constitutive, the production of PGI_2 can be dramatically increased by the induced expression of COX-2, particularly in vascular cells and macrophages. PGI_2 is rapidly secreted from source cells, presumably through an ATP-binding cassette (ABC) transporter. PGI_2 activates neighboring cells which bear the specific I-prostanoid (IP) receptor, a GPCR that signals through Gαs to activate adenylate cyclase (AC) and elevate intracellular cAMP levels (Figure 2). Through this pathway, PGI_2 relaxes vascular and bronchial smooth muscle, inhibits platelet aggregation, and suppresses the production of proinflammatory cytokines, angiogenic cytokines, and mediators of extracellular matrix remodeling (*e.g.*, IL-1, IL-6, VEGF, TGF-β, thromboxane). In the circulation, PGI_2 is non-enzymatically hydrated to 6-keto $PGF_{1\alpha}$ ($t_{1/2}$ = 2-3 minutes), and then converted to the major metabolite, 2,3-dinor-6-keto $PGF_{1\alpha}$ ($t_{1/2}$ = 30 minutes).

Analogs of PGI_2

Epoprostenol is another name for PGI_2. The sodium salt, epoprostenol sodium, is marketed for therapeutic use in the formulation called Flolan™. Used in the treatment of PAH, it must be given intravenously because of its very short physiologic half-life. Carbaprostacyclin (originally called carbacyclin) is a first generation analog of PGI_2 with a simple carbon-for-oxygen substitution. While it is about 30 times less potent than PGI_2 as an inhibitor of induced platelet aggregation, it is more chemically stable.[5] Surprisingly, carbaprostacyclin has been shown to be an effective activator of peroxisome proliferator-activated receptor δ (PPARδ), which is involved in adipocyte regulation and modulates monocyte/macrophage function.[6] This suggests that PGI_2 may be an endogenous ligand for PPARδ, which might be particularly relevant when COX-2 is induced and elevated levels of PGI_2 are generated.Cicaprost is a PGI_2 analog that is orally active with prolonged availability *in vivo*, having a terminal half life in plasma of one hour.[7] Importantly, cicaprost has been shown to strongly reduce lung and lymph node metastasis in rats, suggesting that it might be useful in cancer therapy.[8]

Beraprost, like cicaprost, is an orally active PGI_2 analog. Marketed as an ingredient in the formulations Dorner™ and Procyclin™, it has a half-life in plasma of several hours, effectively improves pulmonary hemodynamics in patients with pulmonary hypertension, and inhibits platelet aggregation. In clinical trials, beraprost has been found to be safe and well-tolerated.[9] It is now being tested for efficacy in peripheral vascular disease, Buerger's disease, arteriosclerosis obliterans, and reduction of reperfusion injury, as well as in PAH. Iloprost (ingredient of Ventavis™), a second generation analog of PGI_2, is used in aerosolized form. It binds with equal affinity to the human IP and EP_1 (PGE_2) receptors, a K_i value of 11 nM.[10] In whole animals, iloprost acts as a vasodilator, hypotensive, antidiuretic, and prolongs bleeding time. It has been demonstrated to be effective in the treatment of PAH and is well-tolerated in long-term usage.[11,12] Intravascular iloprost has mixed utility in the treatment of Raynaud's syndrome.[13]

Treprostinil is one of the newer stable PGI_2 analogs and is currently used for the treatment of PAH, formulated for infusion, either subcutaneous or intravenous (Remodulin™), and inhalation (Tyvaso™) are available. In addition to its direct vasodilatory effects, it also potently inhibits macrophage function, preventing NF-κB activation, phagocytosis, and production of pro-inflammatory cytokines.[4,13]

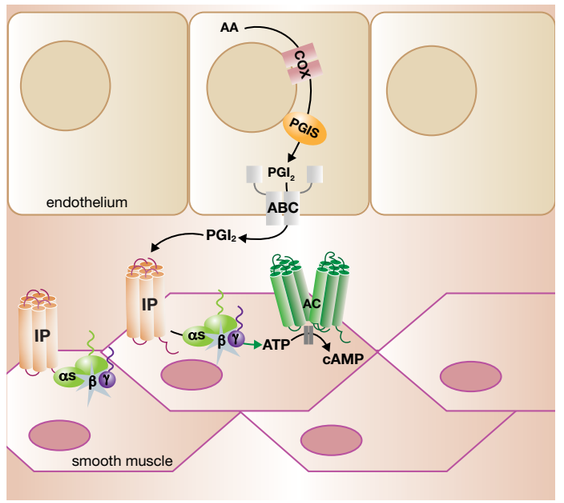

Figure 2. PGI_2 is synthesized from AA by the COX pathway *via* PGIS. Secreted PGI_2 activates the IP receptor, which induces cAMP synthesis from ATP by AC. In the vascular system, PGI_2 from the endothelium causes relaxation of vascular smooth muscle.

A common test for effectiveness of treatment is the 'six minute walk', performed in the pulmonary function facility. The test provides information on how far the patient can walk in six minutes and what happens to blood oxygen levels during exertion. With these data, treatments can be assessed and optimized. Because each of the prostacyclin analogs is distinctive in its mode of delivery, stability in plasma, and additional actions, the choice for treatment must be matched to the patient's needs.

Prostacyclin and Analogs for Research Use

Item No.	Product Name	
16831	**Cicaprost**	Taken orally; half life in plasma of one hour
18230	**Beraprost**	Orally active (Dorner™, Procyclin™); half life of several hours in plasma
18215	**Iloprost**	Inhaled (Ventavis™)
10162	**Treprostinil**	Injected (Remodulin™) or inhaled (Tyvaso™)
18220	**Prostaglandin I_2 (Sodium Salt)**	Injected (Flolan™)
18210	**Carbaprostacyclin**	Taken orally; rapidly metabolized

For a full product listing, please visit www.caymanchem.com

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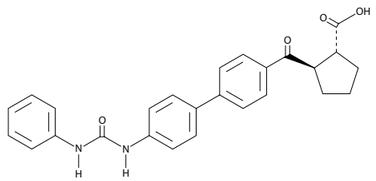
A-922500 10012708

[959122-11-3] (1R,2R)-2-(4'-(3-phenylureido)biphenylcarbonyl)-Cyclopentane Carboxylic Acid)
MF: $C_{26}H_{24}N_2O_4$ **FW:** 428.5 **Purity:** ≥95%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A potent inhibitor of DGAT-1 (IC_{50}s = 7 and 24 nM, for human and murine, respectively); confers significant weight loss within seven days and significantly reduces plasma and liver triglycerides when administered at 3 mg/kg to DIO mice

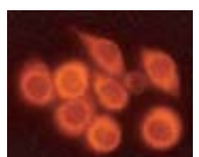
1 mg
5 mg
10 mg
25 mg



ACAT-1 Polyclonal Antibody 100028

Acyl-coenzyme A:Cholesterol Acyltransferase-1, Sterol O-Acyltransferase 1
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human ACAT-1 amino acids 6-23 • Host: rabbit • Cross Reactivity: (+) murine, rat, porcine, and human ACAT-1 • Application(s): ICC, IHC, and WB • ACAT-1 catalyzes the formation of cholesterol esters from cholesterol and long chain fatty acyl-CoA, and may play a role in the development of atherosclerosis.

500 µl



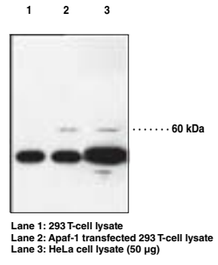
Immunofluorescent staining of RAW 264.7 cells with anti-human ACAT-1 polyclonal antibody. The positive staining was visualized with an anti-rabbit secondary antibody conjugated to Cy3. Note the very intense perinuclear staining.

•Also Available: **ACAT-1 Blocking Peptide** (10005090)

ACAT-2 Polyclonal Antibody 100027

Acyl-coenzyme A:Cholesterol Acyltransferase-2, Sterol O-Acyltransferase 2
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human ACAT-2 amino acids 3-20 • Host: rabbit • Cross Reactivity: (+) human, murine, rat, porcine, and ovine ACAT-2 • Application(s): ICC, IHC, and WB • ACAT-2 catalyzes the formation of cholesterol esters from cholesterol and long chain fatty acyl-CoA.

500 µl



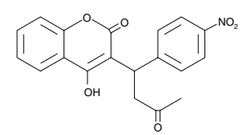
Lane 1: 293 T-cell lysate
Lane 2: Apaf-1 transfected 293 T-cell lysate
Lane 3: HeLa cell lysate (50 µg)

•Also Available: **ACAT-2 Blocking Peptide** (10005091)

Acenocoumarol 10010569

[152-72-7] Acenocoumarin, G-23350, Nicoumalone, Sinthrome, Sintron
MF: $C_{19}H_{15}NO_6$ **FW:** 353.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An analog of the oral anticoagulant warfarin; functions as a vitamin K antagonist and has a half-life in plasma of about eight hours

10 mg
50 mg
100 mg
250 mg

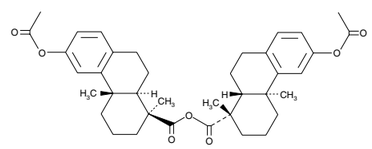


•Also Available: **(R)-(+)-Acenocoumarol** (9000336)
(S)-(-)-Acenocoumarol (9000337)

Acetyl Podocarpic Acid Anhydride 10007686

[344327-48-6] APD
MF: $C_{38}H_{46}O_7$ **FW:** 614.8 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent, semi-synthetic LXR agonist derived from extracts of the mayapple; induces the expression of the ABCA1 reverse cholesterol transporter to increase the efflux of cholesterol from enterocytes and thus inhibits the overall absorption of cholesterol (ED_{50} = 1 nM)

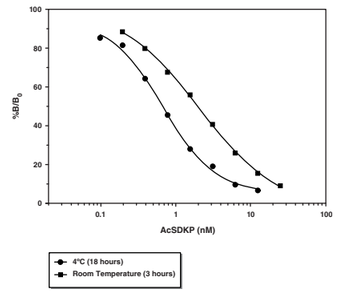
1 mg
5 mg
10 mg
50 mg



AcSDKP EIA Kit+ 589451

N-Acetyl Ser-Asp-Lys-Pro
Stability: ≥6 months at -20°C
Limit of Detection: 1.5 pg/ml
Sensitivity: 50% B/B_0: 2.0 nM after 3 hour immunological reaction • 0.5 nM after 18 hour immunological reaction • 80% B/B_0: 0.2 nM after 18 hour immunological reaction
Summary: AcSDKP is a tetrapeptide growth regulatory hormone which inhibits the proliferation of hematopoietic stem cells. The dipeptidase angiotensin converting enzyme (ACE) actively metabolizes circulating AcSDKP, giving it a brief plasma half-life of 4 to 5 minutes. ACE inhibition is a major therapeutic end point in the treatment of hypertension management. A further consequence of ACE inhibition is the accumulation of AcSDKP in plasma and urine. This accumulation may have physiological effects, which are manifested as the anemia of chronic ACE inhibitor toxicity. More commonly, plasma and urine AcSDKP levels can be used as a biomarker of ACE inhibition and an index of patient compliance with therapy. Measurement of AcSDKP in human urine or plasma can be readily accomplished by EIA.

96 wells

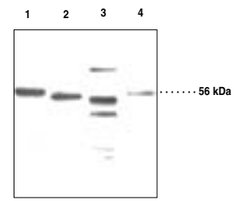


+ *SPI-BIO Assays are available through Cayman Chemical only within North & South America and Asia; elsewhere contact SPI-BIO.*

Adipose Triglyceride Lipase Polyclonal Antibody 10006409

ATGL, Desnutrin, $PLA_2\zeta$
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human adipose triglyceride lipase (ATGL) amino acids 382-400 • Host: rabbit • Cross Reactivity: (+) human, murine, and rat ATGL • Application(s): IHC (paraffin-embedded sections) and WB • ATGL is one of the key enzymes involved in the mobilization of fatty acids from triglyceride stores in adipose tissue, catalyzing the conversion of triacylglycerols to diacylglycerols.

500 µl



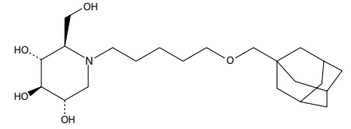
Lane 1:Human liver microsome (50 µg)
Lane 2: HepG2 cell lysate (50 µg)
Lane 3: Rat brown fat homogenate (50 µg)
Lane 4: Murine liver 100,000 x g pellet (50 µg)

•Also Available: **Adipose Triglyceride Lipase Blocking Peptide** (10010569)

AMP-Deoxynojirimycin 10010332

[216758-20-2] Adamantane-pentyl-dNM, AMP-dNM, N-(5-adamantane-1-yl-methoxy-pentyl)-Deoxynojirimycin
MF: $C_{22}H_{39}NO_5$ **FW:** 397.6 **Purity:** ≥95%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A hydrophobic derivative of deoxynojirimycin that potently inhibits BGD (IC_{50} = 0.3 nM), less potently antagonizes GCS (IC_{50} = 25 nM), but only poorly inhibits other GCase isoforms; suppresses hapten-induced colitis, enhances insulin sensitivity, and induces SREBP-regulated gene expression and cholesterol synthesis

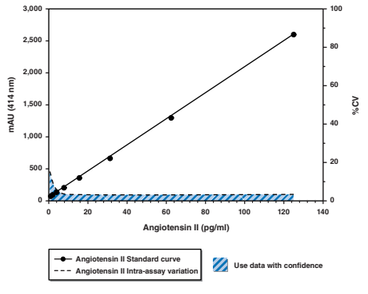
500 µg
1 mg
5 mg
10 mg



Angiotensin II EIA Kit+ 589301

Stability: ≥6 months at -20°C
Limit of Detection: 1.5 pg/ml
Summary: Angiotensin II is a primary reactive vasoconstrictor, the main stimulus for aldosterone release, and one of the causative factors of chronic hypertension. The active angiotensin II octapeptide is released *via* a tightly controlled series of prohormones and proteases. The unique, patented 'Immobilized Antigen' technology of this angiotensin II immunometric assay allows reliable detection of 1-2 pg/ml, or as little as 10% of the normal human plasma concentration.

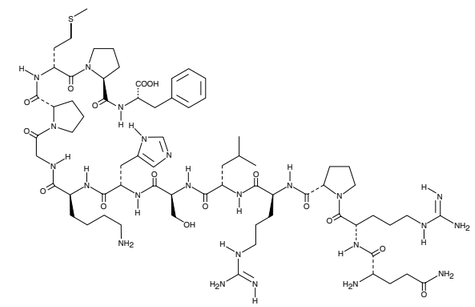
96 wells



Apelin-13 13523

[217082-58-1]
MF: $C_{69}H_{111}N_{23}O_{16}S$ **FW:** 1,550.8 **Purity:** ≥95%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: Endogenous ligand of the APJ receptor, with an EC_{50} value of 0.37 nM; acts primarily in the periphery and CNS, playing important roles in regulating cardiovascular function, fluid homeostasis, hypertension, and insulin sensitivity

1 mg
5 mg
10 mg
25 mg



ApoAI Monoclonal Antibody (Clone CC3821C4) 13042

Lyophilized IgG_1 **Stability:** ≥1 year at 4°C
Summary: Antigen: human ApoAI amino acids 188-199 • Host: mouse, clone CC3821C4 • Cross Reactivity: (+) human ApoAI, (-) ApoB • Application(s): WB • ApoAI is a major protein component of HDL. It acts as an acceptor for sequential transfers of phospholipids and free cholesterol from peripheral tissues and transports cholesterol to the liver and other tissues for excretion and steroidogenesis.

1 ea

ApoAI Polyclonal Antibody 10008463

Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human ApoAI protein amino acids 188-199 • Host: rabbit • Cross Reactivity: (+) human, murine, and rat ApoAI protein • Application(s): ICC and WB • ApoAI is a major protein component of HDL. It acts as an acceptor for sequential transfers of phospholipids and free cholesterol from peripheral tissues and transports cholesterol to the liver and other tissues for excretion and steroidogenesis.

500 µl

•Also Available: **ApoAI Blocking Peptide** (13079)

ApoAI Western Ready Control 10009751

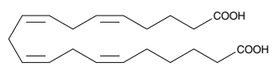
M_r: 28 kDa
Stability: ≥6 months at -80°C
Summary: Source: human recombinant protein • Application(s): positive control for WB

1 ea

20-carboxy Arachidonic Acid 10007912

[79551-84-1] 20-COOH-AA
MF: $C_{20}H_{30}O_4$ **FW:** 334.5 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A major metabolite of 20-HETE produced in renal tubular epithelial, endothelial, and microvascular smooth muscle cells; inhibits ion transport in the kidneys and has vasodilatory activity

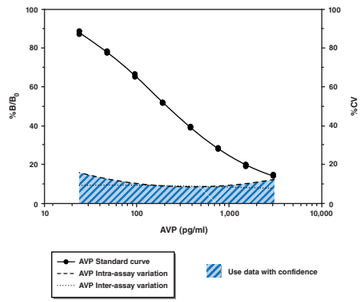
25 µg
50 µg
100 µg
500 µg



Arginine Vasopressin EIA Kit 583951

ADH, Antidiuretic Hormone, Argipressin, AVP , Vasopressin
Stability: ≥1 year at -20°C
Sensitivity: 50% B/B_0: ~220-380 pg/ml • 80% B/B_0: ~45-60 pg/ml
Summary: AVP is a nine amino acid peptide hormone that plays a primary role in the regulation of renal water excretion and a secondary role in the regulation of cardiovascular function in mammals. Cayman's AVP EIA is a competitive assay that can be used for the measurement of AVP from plasma and serum.

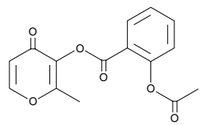
96 strip/solid wells
480 strip/solid wells



Aspalatone 13644

[147249-33-0] Acetylsalicylic Acid Matol ester
MF: $C_{15}H_{12}O_6$ **FW:** 288.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An anti-platelet aggregator (IC_{50} = 180 µM, *in vitro*) that prolongs bleeding time significantly in a rodent model of thromboembolism; at 24 mg/kg, generates antioxidant and neuroprotective effects against kainic acid-induced epilepsy in rat hippocampus

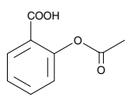
5 mg
10 mg
50 mg
100 mg



Aspirin 70260

[50-78-2] Acetylsalicylic Acid
MF: $C_9H_8O_4$ **FW:** 180.2 **Purity:** ≥99%
A crystalline solid **Stability:** ≥2 years at room temperature
Summary: A non-selective, irreversible COX inhibitor with IC_{50} values of 0.75 and 1.25 mM for ovine COX-1 and COX-2, respectively

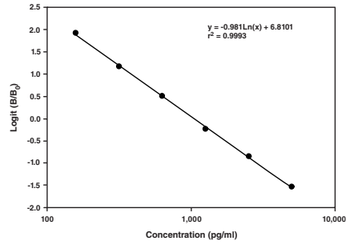
5 g
25 g
50 g
100 g



Aspirin™ Effect-Detection Kit 10010153

Stability: ≥1 year at 4°C
Summary: Cayman's Aspirin™ Effect-Detection assay is a 510K, clinically-approved diagnostic kit for the measurement of 11-dehydro TXB_2. It is intended to help physicians assess the effectiveness of their patients' Aspirin™ regime, and to help identify the high-risk group who are inadequately controlled on an 80 mg aspirin dose. This assay can be completed in 3 hours and utilizes urine as the sample matrix. The assay exhibits intra-assay %CV values of <11% with sensitivity sufficient to detect the lower levels of 11-dehydro TXB_2 in patients that respond well to Aspirin™.

1 ea



Atherosclerosis Product Pack 10005292

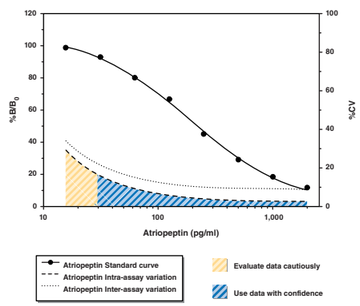
Stability: ≥6 months at -20°C
Summary: Contains ACAT-1 polyclonal antibody and blocking peptide, cholesteryl linoleate hydroperoxides, POV-PC, and PGPC

1 ea

Atriopeptin (rat) EIA Kit+ 589401

Stability: ≥6 months at -20°C
Sensitivity: 50% B/B_0: 190 pg/ml • 80% B/B_0: 60 pg/ml
Summary: Atriopeptin is a 28 amino acid peptide synthesized primarily in cardiac atria. This peptide hormone acts in opposition to angiotensin II in regulating renal, hemodynamic, and endocrine function. Atriopeptin is released in response to the increased pressure and mechanical stretch of the right atrium due to blood volume overload. Atriopeptin then acts at the nephron to increase salt and water excretion, lowering blood volume and blood pressure.

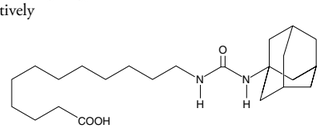
96 wells



AUDA 10007927

[479413-70-2]
MF: $C_{23}H_{40}N_2O_3$ **FW:** 392.6 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An inhibitor of sEH exhibiting IC_{50} values of 18 and 69 nM for the murine and human enzymes, respectively

5 mg
10 mg
50 mg
100 mg

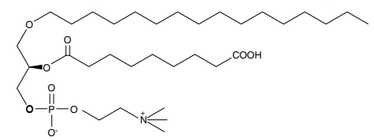


+ *SPI-BIO Assays are available through Cayman Chemical only within North & South America and Asia; elsewhere contact SPI-BIO.*

Azelaoyl PAF 60924

MF: $C_{33}H_{66}NO_9P$ **FW:** 651.9 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A PAF analog isolated and purified from oxLDL; acts as a potent PPARγ agonist

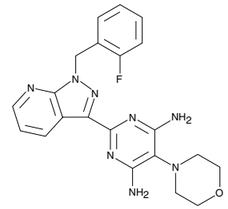
500 µg
1 mg
5 mg
10 mg



BAY-41-8543 10011131

[256498-66-5]
MF: $C_{21}H_{21}FN_8O$ **FW:** 420.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A stimulator of sGC, increasing the activity of recombinant sGC dose-dependently, from 0.1 nM to 100 µM, up to 92-fold; *in vitro*, relaxes vessels and inhibits platelet aggregation at nM concentrations; *in vivo*, decreases blood pressure dose-dependently, prolongs bleeding time, and reduces thrombosis

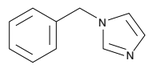
1 mg
5 mg
10 mg
25 mg



1-Benzylimidazole 70510

[4238-71-5]
MF: $C_{10}H_{10}N_2$ **FW:** 158.2 **Purity:** ≥99%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A selective inhibitor of TX synthase

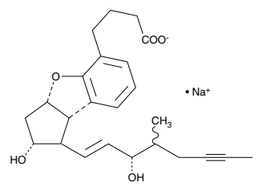
1 g
5 g
25 g
100 g



Beraprost (sodium salt) 18230

[88475-69-8] ML 1129, Procylin, TRK 100
MF: $C_{24}H_{29}O_5$ • Na **FW:** 420.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An analog of prostacyclin in which the unstable enol-ether moiety has been replaced by a benzofuran ether function; exhibits a plasma half-life of several hours; improves survival and pulmonary hemodynamics in patients with primary pulmonary hypertension

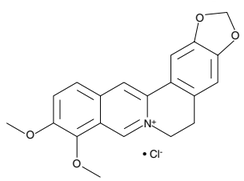
1 mg
5 mg
10 mg
50 mg



Berberine 10006427

[633-65-8] BBR, Umbellatine
MF: $C_{20}H_{18}ClNO_4$ **FW:** 371.8 **Purity:** ≥95%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An alkaloid natural product that reduces total cholesterol, LDL cholesterol, and triglycerides in humans and hamsters; enhances LDL-receptor protein and mRNA levels in hepatocytes

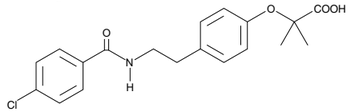
1 g
5 g
10 g
25 g



Bezafibrate 10009145

[41859-67-0] Benzofibrate, BM 15075, Bezalip, Bezatrol, Difaterol
MF: $C_{19}H_{20}ClNO_4$ **FW:** 361.8 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A well-established pan PPAR agonist; activates human PPARα, PPARδ, and PPARγ with EC_{50} values of 50, 20, and 60 µM, respectively; helps lower LDL cholesterol and triglycerides while raising HDL cholesterol levels

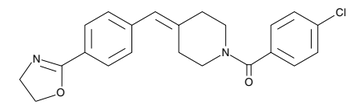
500 mg
1 g
5 g
10 g



BIBB 515 10010517

[156635-05-1]
MF: $C_{22}H_{21}ClN_2O_2$ **FW:** 380.9 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A selective and potent inhibitor of 2,3-oxidosqualene cyclase (OSC) *in vivo* with an ED_{50} value of 0.2-0.5 and 0.36-33.3 mg/kg in rats and mice, respectively; reduced total cholesterol by 19% in normolipemic hamsters at a dose of 55 mg/kg/day for 11 days and 25% in hyperlipemic hamsters at a dose of 148 mg/kg/day for 25 days

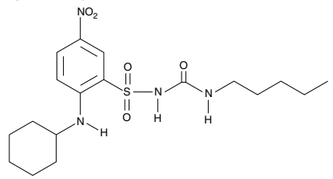
1 mg
5 mg
10 mg
25 mg



BM 567 10155

[284464-77-3]
MF: $C_{18}H_{28}N_4O_5S$ **FW:** 412.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A dual acting antithrombogenic agent; inhibitor of TXA_2 synthase (IC_{50} = 12 nM); acts as a TP receptor antagonist (IC_{50} = 1.1 nM)

1 mg
5 mg
10 mg
50 mg

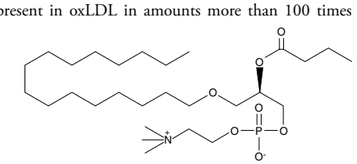


NOTE: Sold under license from Université of Liège

Butanoyl PAF 60928

MF: $C_{28}H_{58}NO_7P$ **FW:** 551.7 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A PAF analog isolated from oxLDL; retains at least 10% of the agonist potency of PAF itself but is present in oxLDL in amounts more than 100 times greater than PAF

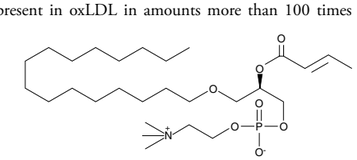
1 mg
5 mg
10 mg
50 mg



Butenoyl PAF 60929

MF: $C_{28}H_{56}NO_7P$ **FW:** 549.7 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A PAF analog isolated from oxLDL; retains at least 10% of the agonist potency of PAF itself but is present in oxLDL in amounts more than 100 times greater than PAF

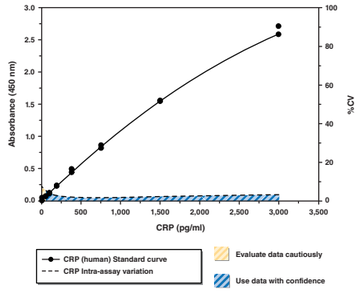
1 mg
5 mg
10 mg
50 mg



C-Reactive Protein (human) EIA Kit 10011236

CRP
Stability: ≥6 months at 4°C
Limit of Detection: 46.9 pg/ml
Summary: CRP is a 224 amino acid protein that is synthesized primarily by hepatocytes, and to a lesser extent adipocytes. CRP plasma levels increase ~1,000-fold in response to acute and chronic inflammatory conditions, making it a useful gauge of inflammation in a wide range of physiological and pathological conditions. Cayman's CRP (human) EIA is a sensitive immunometric assay which can be used to measure CRP in plasma without prior sample purification.

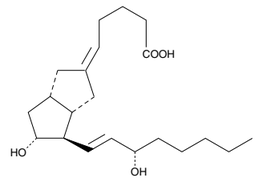
96 wells



Carbaprostacyclin 18210

[69552-46-1] Carbacyclin, cPGI
MF: $C_{21}H_{34}O_4$ **FW:** 350.5 **Purity:** ≥99%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A stable analog of PGI_2 with reduced potency; inhibits ADP-induced platelet aggregation in human PRP (ED_{50} = 47 nM)

500 µg
1 mg
5 mg
10 mg

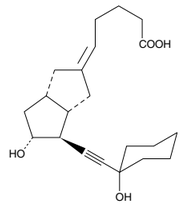


•Also Available: **Carbaprostacyclin-biotin** (18213)
Carbaprostacyclin methyl ester (9000183)
5-*cis* Carbaprostacyclin (18211)

13,14-dehydro-15-cyclohexyl Carbaprostacyclin 18212

[145375-81-1]
MF: $C_{21}H_{30}O_4$ **FW:** 346.5 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A chemically stable analog of PGI_2; inhibits the ADP-induced aggregation of human platelets with an ED_{50} value of about 40 nM in PRP and 77 nM in washed platelets

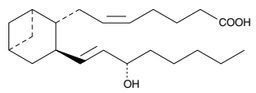
50 µg
100 µg
500 µg
1 mg



Carbocyclic Thromboxane A_2 19010

[74034-56-3] Carbocyclic TXA_2, CTA_2
MF: $C_{22}H_{36}O_3$ **FW:** 348.5 **Purity:** ≥98%*
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A stable analog of TXA_2 with potent coronary vasoconstrictor activity; inhibits arachidonic acid-induced aggregation (IC_{50} = 4-5 µM); inhibits TXB_2 synthesis in rabbit platelets

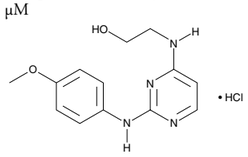
100 µg
500 µg
1 mg
5 mg



Cardiogenol C (hydrochloride) 13187

[671225-39-1]
MF: $C_{13}H_{16}N_4O_2$ • HCl **FW:** 296.8 **Purity:** ≥97%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: Induces the differentiation of MHC-positive cardiomyocytes from embryonic stem cells with an EC_{50} value of 0.1 µM

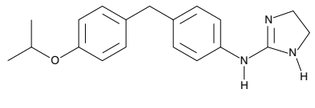
1 mg
5 mg
10 mg
50 mg



CAY10441 10005186

[221529-58-4] RO1138452
MF: $C_{19}H_{23}N_3O$ **FW:** 309.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent IP receptor antagonist; inhibits the binding of tritiated iloprost to rodent neuroblastoma cells with a K_i value of about 1.5 nM

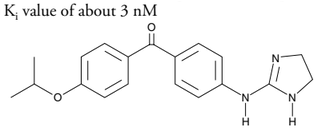
1 mg
5 mg
10 mg
25 mg



CAY10449 10005913

MF: $C_{19}H_{21}N_3O_2$ **FW:** 323.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent IP receptor antagonist; inhibits the binding of tritiated iloprost to rodent neuroblastoma cells with a K_i value of about 3 nM

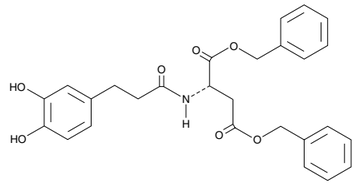
1 mg
5 mg
10 mg
25 mg



CAY10485 10006482

[615264-62-5] 3,4-dihydroxy Hydrocinnamic Acid (L-Aspartic Acid dibenzyl ester) amide
MF: $C_{27}H_{27}NO_7$ **FW:** 477.1 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An inhibitor of human ACAT-1 and ACAT-2 with IC_{50} values of 95 and 81 µM, respectively; inhibits copper-mediated oxidation of LDL by 91% at a concentration of 2 µM

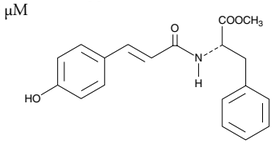
5 mg
10 mg
50 mg
100 mg



CAY10486 10006452

[615264-52-3] 4-Hydroxycinnamic Acid (L-phenylalanine methyl ester) amide
MF: $C_{19}H_{19}NO_4$ **FW:** 325.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An inhibitor of human ACAT-1 and ACAT-2 with an IC_{50} value of approximately 60 µM for both enzymes; also inhibits copper-mediated oxidation of LDL by about 28% at a concentration of 3 µM

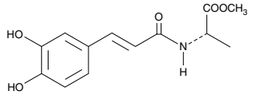
5 mg
10 mg
50 mg
500 mg



CAY10487 10006480

[778624-05-8] 3,4-Dihydrocinnamic Acid (L-alanine methyl ester) amide
MF: $C_{13}H_{15}NO_5$ **FW:** 265.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An inhibitor of fatty streak lesion formation; also inhibits copper-mediated oxidation of LDL by about 75% at a concentration of 2 µM

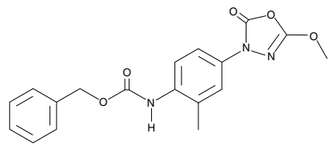
5 mg
10 mg
50 mg
500 mg



CAY10499 10007875

[359714-55-9]
MF: $C_{18}H_{17}N_3O_5$ **FW:** 355.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent inhibitor of human hormone sensitive lipase (IC_{50} = 90 nM)

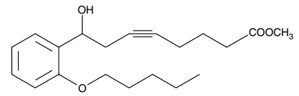
1 mg
5 mg
10 mg
25 mg



CAY10514 10009017

[868526-38-9] Methyl-8-hydroxy-8-(2-pentyl-oxyphenyl)-oct-5-ynoate
MF: $C_{20}H_{28}O_4$ **FW:** 332.4 **Purity:** ≥98%
A solution in methyl acetate **Stability:** ≥1 year at -20°C
Summary: An aromatic analog of 8(S)-HETE; acts as a dual agonist of PPARα and PPARγ with EC_{50} values of 0.17 and 0.64 µM, respectively

1 mg
5 mg
10 mg
50 mg



CD36 Monoclonal Antibody (Clone JC63.1) 188150

GPIIIb, GPIV, Hexarelin Receptor, oxLDL Receptor, Thrombospondin Receptor
Purified mouse anti-CD36 IgA **Stability:** ≥1 year at -20°C
Summary: Antigen: adenovirus expressing full-length recombinant murine CD36 • Host: CD36 null mouse, clone JC63.1 • Isotype: IgA • Cross Reactivity: (+) murine, rat, and human CD36 • Application(s): FC and functional blocking • CD36 is a type-B scavenger receptor that is necessary for the formation of foam cells in atherosclerotic lesions.

100 µg
500 µg

CD36 Monoclonal Antibody (Clone JC63.1) (azide free) 10009893

GPIIIb, GPIV, Hexarelin Receptor, oxLDL receptor, Thrombospondin Receptor
IgA **Stability:** ≥1 year at 4°C
Summary: Antigen: recombinant adenovirus expressing full-length mouse CD36 • Host: CD36 null mouse, clone JC63.1 • Cross Reactivity: (+) human, murine, and rat CD36 • Application(s): FC, functional blocking, and ICC • CD36 is a type-B scavenger receptor that is necessary for the formation of foam cells and thereby atherosclerotic lesions.

100 µg
500 µg

CD36 Monoclonal FITC Antibody (Clone JC63.1) 10009870

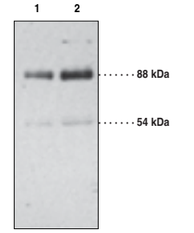
GPIIIb, GPIV, Hexarelin Receptor, oxLDL Receptor, Thrombospondin Receptor
IgA-FITC **Stability:** ≥1 year at -20°C
Summary: Antigen: recombinant adenovirus expressing full-length mouse CD36 • Host: CD36 null mouse, clone JC63.1 • Cross Reactivity: (+) murine, rat, and human CD36 • Application(s): FC and ICC • CD36 is a type-B scavenger receptor that is necessary for the formation of foam cells and thereby atherosclerotic lesions.

1 ea

CD36 Polyclonal Antibody 100011

GPIIIb, GPIV, Hexarelin Receptor, oxLDL Receptor, Thrombospondin Receptor
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human CD36 amino acids 99-114 • Host: rabbit • Cross Reactivity: (+) human, murine, and rat CD36 • Application(s): WB • CD36 is a type-B scavenger receptor that is necessary for the formation of foam cells in atherosclerotic lesions.

500 µl



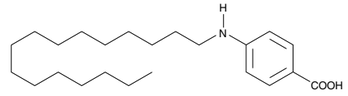
Lane 1: Human platelet lysate (15 µg)
Lane 2: Human platelet lysate (30 µg)

•Also Available: **CD36 Blocking Peptide** (300011)

Cetaben 10007171

[55986-43-1] Hexadecylamino-p-amino Benzoic Acid
MF: $C_{23}H_{39}NO_2$ **FW:** 361.6 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A unique, PPARα-independent peroxisome proliferator with hypolipidemic activity characterized by reduction in serum triglyceride and cholesterol concentrations in rats

5 mg
10 mg
50 mg
100 mg



+ *SPI-BIO Assays are available through Cayman Chemical only within North & South America and Asia; elsewhere contact SPI-BIO.*

vol. 12 Cd

Thomas G. Brock, Ph.D.

Epigenetics: The New Frontier for Vascular Diseases

In the world of personal healthcare, there aren't many things that seem as personally adjustable as cardiovascular health. There are 'heart smart' foods, suggesting that simple changes in diet can reap benefits for your heart. A regular schedule of aerobic exercise will strengthen your cardiovascular system. Adjust your sleep patterns, get a pet, find a spouse, eat less, or listen to classical music and you might enjoy a long life of vascular bliss. The ways you can manipulate the system seem almost endless.

Naturally, there is the genetic side of vascular diseases. Genetic defects in such diverse parameters as lipid metabolism, arterial structure, endothelial and smooth muscle function, platelet adhesiveness, and fibrinolysis can clearly contribute to the development of atherosclerosis, for example. The phenotypic consequences of such defects may range from subtle to pronounced. Superficially, genetic problems seem so much more refractory to treatment than the personal, everyday lifestyle options.

Now, everything is about to get a lot more complicated as well as very interesting. The ways that all those adjustable, personal factors impact gene expression in prolonged, meaningful ways is part of the field of epigenetics. Technically, 'epigenetics' refers to heritable changes in gene expression that do not involve changes in DNA sequence or copy number. The cell biologist uses epigenetic events to help explain how pluripotent stem cells differentiate into diverse cell types, while developmental biologists see epigenetic processes at work in the morphogenesis of an embryo into discrete organs. Similarly, epigenetic signaling that is put in place in response to prenatal or early life events can contribute to disease development much later in life.

Epigenetics: The Basics

In molecular terms, epigenetic changes commonly involve adding or removing various "marks" on chromatin. The basic structural unit of chromatin is the nucleosome, which consists of a short stretch of DNA wrapped twice around a protein octamer composed of two sets of the core histones, H2A, H2B, H3, and H4 (Figure 1). The C-termini of the histones are highly conserved and form the protein core of each nucleosome, while the N-terminal tails project from the nucleosome. These tails can interact with DNA or with other proteins. For example, each tail is rich in regularly spaced, positively-charged residues (lysine (K), arginine (R)), which can associate with the anionic backbone of DNA. Acetylation or methylation of these residues alters their charge and size, affecting DNA binding. Phosphorylation, often on sites adjacent to basic residues, puts a large negatively-charged moiety on the histone. These types of chemical marks also lead to structural changes in the histone tail, providing binding sites for proteins or protein complexes, which in turn modulate further protein or histone changes. Histone marks can be reversed enzymatically, or they can persist for longer periods, extending through multiple cell divisions to maintain cell phenotype. A much more stable modification involves methylation of cytosine residues on DNA, most notably on 'CpG islands', genomic regions that are rich in CG pairs. Methylation of DNA is particularly stable and often results in the suppression of transcription of specific genes by physically interfering with the transcriptional machinery. Methylated DNA, like marked histones, provides binding sites for proteins and the establishment of protein complexes that can modify histones and alter gene expression. These are some of the basic ways that phenotype can be stably altered without changing DNA sequence or copy number.

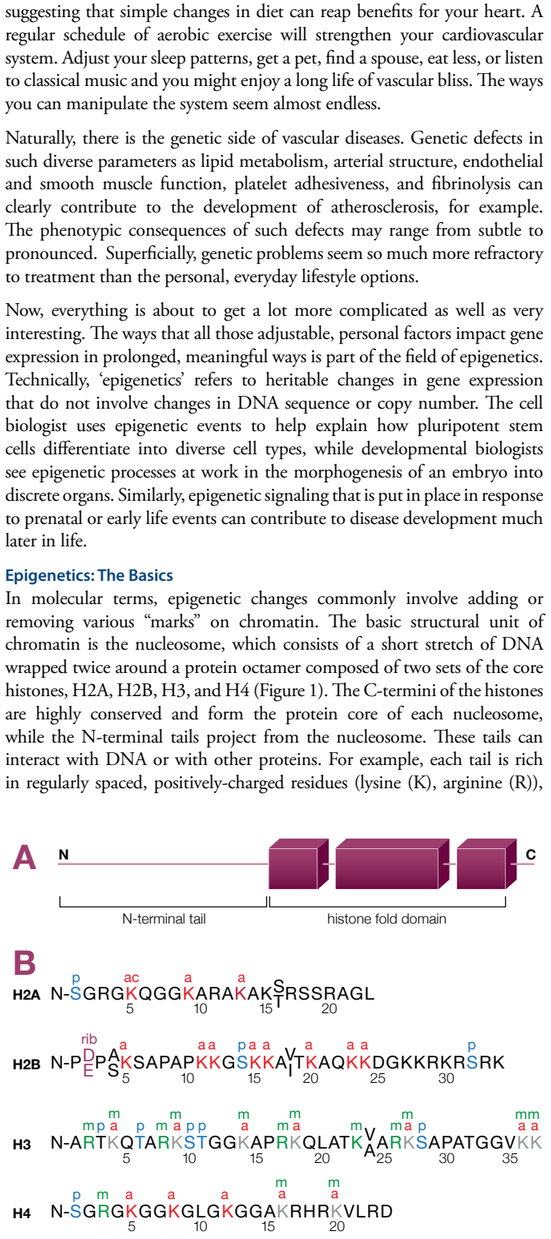


Figure 1. Histone tails. A.) Positioning of the histone tail relative to the C-terminal folded region. B.) Amino acid sequences of core histone N-terminal tails, indicating sites of phosphorylation (p), acetylation (a), ADP ribosylation (rib), and methylation (m).

Food For Thought

You are what you eat, but does your diet affect your children's health? About ten years ago, Bygren and colleagues studied a cohort of individuals born in 1905 in the Överkalix parish in northernmost Sweden, where annual harvests are heavily impacted by the weather.[1] County records provided birth and death dates for the 1905 cohort, their parents and their grandparents. Additional records indicated years of poor, moderate, or superior availability of crop food during the preceding century. Was the lifespan of the individuals born in 1905 affected by the nutritional experience of their predecessors? To focus this question, the authors hypothesized that, in order for famine or food surplus to have persistent effects, the dietary impact must occur in a sexually formative period. Interestingly, they found a significant correlation between food availability for paternal grandfathers when they were 9-12 years old and the survival of their grandchildren. Perhaps more remarkably, grandchild lifespan shortened if there was an excess of food for the paternal grandfather and increased if the grandfather experienced famine during this critical developmental stage. The effect was not trivial: the difference in survival for grandchildren averaged 32 years!

A follow-up study by the same group expanded the study to include cohorts from 1890, 1905, and 1920 and examined cause of death data.[2] They reported that a father experiencing famine during the critical 9-12 years of age passed protection against cardiovascular disease to his children. To restate: famine for the father meant less cardiovascular disease for his children. No significant correlations were found for mothers, grandmothers, or grandparents and offspring cardiovascular disease. These correlative studies anticipated a decade of studies into the now popular concept that the diet of the mother might reprogram the genes of the fetus, without mutation, leading to persistent effects in health and development of the child.[3]

Case in Point: Epigenetics in Hypertension

Aldosterone is a corticosteroid hormone that, through mineralocorticoid receptors, alters the uptake and secretion of salts by collecting ducts of the kidneys, thus altering water uptake, blood volume, and blood pressure. Excess aldosterone contributes to arterial hypertension, congestive heart failure, chronic kidney disease, coronary artery disease, and stroke.[4] Clearly, the mechanism of action of aldosterone at the kidney collecting duct must be important.

One enzyme serves to hypermethylate the lysine residue 79 on histone 3 (H3K79). In yeast, ablation of this methyltransferase causes disruption of telomere silencing, leading to the name DOT1. A mouse DOT1 homolog, DOT1L, also hypermethylates H3K79 in mice, but this serves to repress the expression of a subset of genes. DOT1L binds to AF9, a DNA-binding protein which positions DOT1L only on those nucleosomes whose associated DNA has a sequence that is recognized by AF9. This confers selectivity for which nucleosomes are targeted for hypermethylation of H3K79 and which genes are consequently repressed. One such gene encodes a sodium channel subunit, epithelial Na^+ channel subunit α (ENaCα).

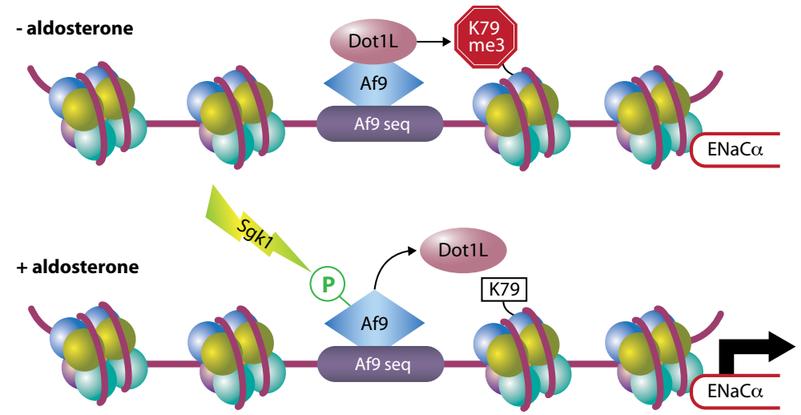


Figure 2. Aldosterone promotes the phosphorylation of Af9 by Sgk1, dissociating DOT1L from Af9, allowing demethylation of H3K79 and the expression of ENaCα.

Aldosterone alters the expression of ENaCα by modulating the DOT1L/AF9 repressive complex (Figure 2). Aldosterone induces the expression of serum- and glucocorticoid-induced kinase 1 (Sgk1), which phosphorylates AF9 and disrupts the complex.[5] Aldosterone also inhibits the expression of both DOT1L and AF9.[6,7] These steps are necessary and sufficient to increase ENaCα expression in the presence of the hormone-receptor complex.

It is worth noting that this pathway involves a short term and reversible mechanism involving histone modification. Such transient changes are the hallmark of the 'signaling model' of epigenetic modifications. These contrast with other pathways where histone modifications are inherited through cell division, the so-called 'histone code hypothesis' of epigenetic signaling.

Classical Epigenetic Studies

The Dutch Famine Birth Cohort Studies relate to babies born around a 5-month period of extreme food shortage during the winter of 1944-1945. Numerous characteristics of mothers and offspring were obtained around birth and the offspring have been followed since. In one study, exposure to famine during gestation led to a higher cumulative incidence of coronary artery disease, as well as an earlier age at onset, than was found for those not exposed to famine during gestation.[8] Moreover, these effects were found only if exposure to famine occurred early in gestation. Such correlative studies leave us to wonder: what could have happened during those first few months of development that became evident only years later?

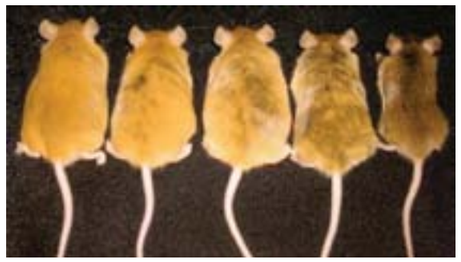


Figure 3. Genetically identical week 15 littermates representing coat colors ranging from agouti (left) to pseudoagouti (right); Note differences in size

A series of recent studies have come closer to demonstrating epigenetics in action. While obviously the diet of a pregnant mother can affect fetal development, these studies indicate that dietary supplements, taken by the mother, may mark the genome of the fetus and affect adult health. In the viable yellow agouti (Avy) mouse, expression of the agouti gene leads to a switch from brown to yellow coat color (Figure 3). Moreover, adult agouti mice suffer from obesity, hyperlipidemia, and hypertension. The expression of the agouti gene is initiated from a cryptic promoter in a retrotransposon inserted in agouti pseudoexon 1A (PS1A).[9] It's known that cytosine methylation on the transposable element prevents agouti gene expression, producing a brown-coated mouse that is referred to as 'pseudoagouti'.[10] Waterland and Jirtle demonstrated that supplementing normal chow given to pregnant mice with methyl donors (folic acid, betaine, vitamin B12, choline) produced an increase in methylation of CpG sites within PS1A in the offspring and shifted the coat color distribution toward the brown (pseudoagouti) phenotype.[9] These methylation patterns were found in cells from diverse tissues, showing that Avy methylation is determined in the early embryo and maintained with high fidelity throughout development.

In another study, genistein, an isoflavonoid naturally found in soy, increased both PS1A methylation and frequency of pseudoagouti expression in offspring when added to the mother's diet.[11] Importantly, ectopic agouti expression is associated with adult-onset obesity, diabetes, and cancer.[12] Hypermethylation of PS1A, in mice from genistein-fed mothers, persisted into adulthood, decreasing agouti expression, and, remarkably, protecting mice from obesity.[11] Conversely, hypomethylation of PS1A, following exposure to the common chemical bisphenol A (BPA), increased agouti expression;[13] BPA is known to promote obesity, hyperlipidemia, and hypertension in mice. Taken together, these results demonstrate that maternal diet has in utero effects on the epigenome of the early embryo that can alter susceptibility to disease into adulthood.

References

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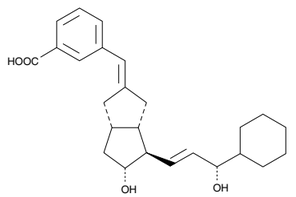
Cholesterol Synthesis Inhibitors			
Item No.	**Item Name**	**Target Enzyme**	**K_i**
10010337	Fluvastatin (sodium salt)	HMG-CoA Reductase	0.3 nM
10010338	Lovastatin	HMG-CoA Reductase	0.6 nM
10010339	Lovastatin Hydroxy Acid (sodium salt)	HMG-CoA Reductase	0.6 nM
10010340	Mevastatin	HMG-CoA Reductase	1 nM
10010343	Pravastatin (sodium salt)	HMG-CoA Reductase	2.3 nM
10006415	Ro 48-8071	Oxidosqualene Cyclase	IC_{50} = 1.5-6.5 nM
10010334	Simvastatin	HMG-CoA Reductase	0.12 nM

For a full product listing, please visit www.caymanchem.com

CG 4305 10012447

MF: $C_{25}H_{32}O_4$ **FW:** 396.5 **Purity:** ≥95%
A solution in methyl accetate **Stability:** ≥1 year at -20°C
Summary: A stable carbacyclic PGI_2 analog that inhibits ADP-induced platelet aggregation 25% at a concentration of 50 nM; 10 mg/kg (oral) or 1 mg/kg (intraduodenal) prevents thrombotic arterial occlusion

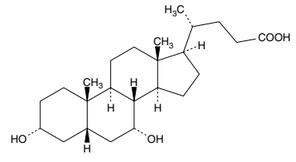
100 µg
500 µg
1 mg
5 mg



Chenodeoxycholic Acid 10011286

[474-25-9] Anthropodeoxycholic Acid, CDCA, Fluibil, Hekbilin, Kebilis, Ulmenide
MF: $C_{24}H_{40}O_4$ **FW:** 392.6 **Purity:** ≥95%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A bile acid and farnesoid X receptor (FXR) ligand (EC_{50} = 13-34 µM) that is a key regulator of cholesterol homeostasis; exhibits toxicity that is linked to increased glutathione and increased oxidative stress; excess CDCA contributes to liver and intestinal cancers

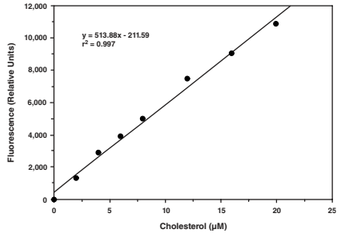
1 g
5 g
10 g
25 g



Cholesterol Assay Kit 10007640

Stability: ≥1 year at -20°C
Summary: Cholesterol, particularly in the form of LDLs, is well understood to be associated with increased risk of coronary heart disease. The measurement of cholesterol is one of the most common tests performed in the clinical laboratory setting. However, simple and easy assays for cholesterol in the research lab have not been readily available. Cayman's Cholesterol Assay provides a simple fluorometric method for the sensitive quantitation of total cholesterol in plasma or serum.

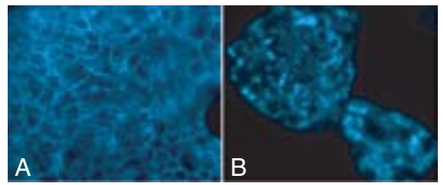
96 wells
480 wells



Cholesterol Cell-Based Detection Assay Kit 10009779

Stability: ≥6 months at -20°C
Summary: The mechanism for the movement of cholesterol from intracellular sites to their ultimate cellular destination is an unresolved question of fundamental importance to cell biology and medicine. Cayman's Cholesterol Cell-based Detection Assay provides a simple fluorometric method to study mechanisms and biological factors that regulate cholesterol metabolism or movement within cells.

192 wells

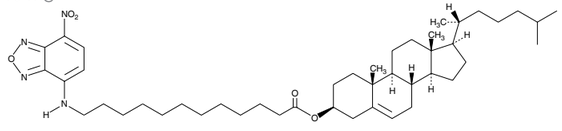


Accumulation of cholesterol inside HepG2 cells in response to 1.25 µM U18666A. HepG2 cells were treated with DMSO (vehicle) or 1.25 µM U-18666A for 48 hours. *Panel A:* Cells treated with DMSO alone demonstrate that majority of cholesterol is localized on the plasma membrane. *Panel B:* U-18666A treatment for 48 hours induces intracellular accumulation of cholesterol droplets, indicating blockage of intracellular cholesterol transport.

3-dodecanoyl-NBD Cholesterol 13220

3-C12-NBD Cholesterol
MF: $C_{45}H_{70}N_4O_5$ **FW:** 747.1 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A fluorescently-tagged cholesterol with the hydrophilic NBD fluorophore attached to the hydrophilic end of cholesterol, separated by a 12-carbon spacer; allows the cholesterol to properly orient in membrane bi-layers while the fluorescent tag is presented outside of the bi-layer

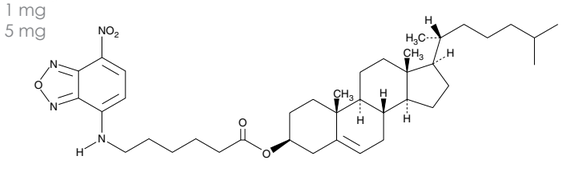
500 µg
1 mg
5 mg
10 mg



3-hexanoyl-NBD Cholesterol 13221

3-C6-NBD Cholesterol
MF: $C_{39}H_{58}N_4O_5$ **FW:** 662.9 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A fluorescently-tagged cholesterol with the hydrophilic NBD fluorophore attached to carbon 3, at the hydrophilic end of cholesterol, separated by a 6-carbon spacer; allows the cholesterol to properly orient in membrane bi-layers while the fluorescent tag is presented outside of the bi-layer

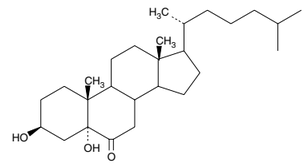
250 µg
500 µg
1 mg
5 mg



5α-hydroxy-6-keto Cholesterol 10007601

[13027-33-3] Cholestane-6-oxo-3β,5α-diol, 6-Oxo-3,5-diol
MF: $C_{27}H_{46}O_3$ **FW:** 418.7 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A major metabolite of cholesterol formed during exposure of lung epithelial cells to ozone; potent inhibitor of cholesterol synthesis in human bronchial epithelial cells (IC_{50} = 350 nM); exhibits significant cytotoxicity in the low µM range

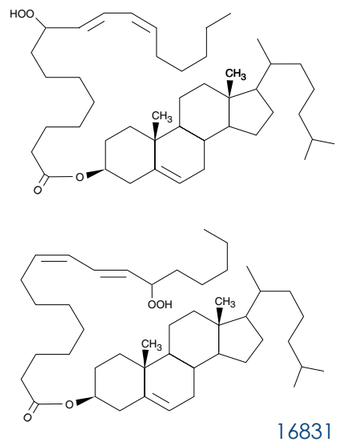
1 mg
5 mg
10 mg
50 mg



Cholesteryl Linoleate Hydroperoxides 48001

MF: $C_{45}H_{76}O_4$ **FW:** 681.1 **Purity:** ≥98% hydroperoxide content
A solution in ethanol **Stability:** ≥6 months at -80°C
Summary: A product derived from the autoxidation of cholesteryl linoleate containing a mixture of racemic 9- and 13-HpODE cholesteryl esters

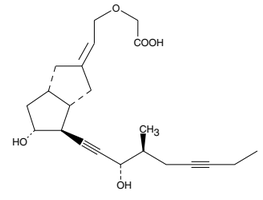
100 µg
500 µg
1 mg
5 mg



Cicaprost 16831

[94079-80-8] ZK 96480
MF: $C_{22}H_{30}O_5$ **FW:** 374.5 **Purity:** ≥98%
A solution in methyl acetate **Stability:** ≥1 year at -20°C
Summary: A prostacyclin analog that is orally active with prolonged availability *in vivo*, having a terminal half-life in plasma of one hour; inhibits the pro-inflammatory actions of certain leukocytes, suppresses cardiac fibrosis, and blocks mitogenesis of certain cell types

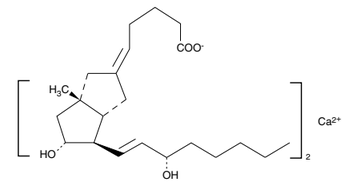
500 µg
1 mg
5 mg
10 mg



Ciprostene (calcium salt) 18216

[81703-55-1] U-61431F
MF: $[C_{22}H_{36}O_4]_2 \bullet Ca^{2+}$ **FW:** 769.1 **Purity:** ≥98%
A crystalline solid **Stability:** ≥6 months at -20°C
Summary: A 9β-methyl analog of carbaprostacyclin and a stable analog of PGI_2; exhibits biological activity similar to PGI_2, but is 30-fold less potent

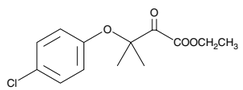
1 mg
5 mg
10 mg
50 mg



Clofibrate 10005745

[637-07-0]
MF: $C_{12}H_{15}ClO_3$ **FW:** 242.7 **Purity:** ≥98%
A colorless liquid **Stability:** ≥1 year at -20°C
Summary: A PPARα agonist used clinically to treat dyslipidemia and cardiovascular disease; exhibits EC_{50} values of 50 and 55 µM for murine and human PPARα, respectively

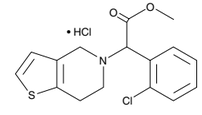
500 µl
1 ml
5 ml
10 ml



(±)-Clopidogrel (hydrochloride) 13657

[90055-48-4]
MF: $C_{16}H_{16}NO_2S \bullet HCl$ **FW:** 358.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An antithrombic compound whose active metabolite is a selective, irreversible antagonist of the platelet purinergic P2Y. receptor (IC_{50} = 100 nM); inhibits ADP-induced platelet aggregation *ex vivo*; shown to be beneficial in the prevention of vascular ischemic events for patients without deficiencies in CYP2C19-related metabolism

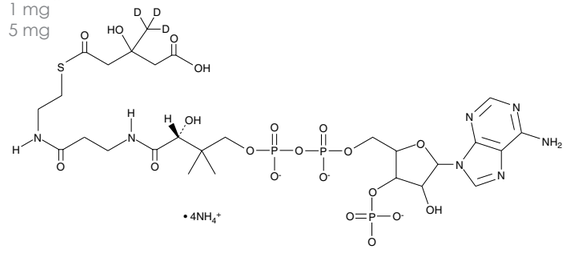
10 mg
50 mg



3-hydroxy-3-methylglutaryl-Coenzyme A-d_3 (ammonium salt) 9000368

HMG-CoA-d_3
MF: $C_{27}H_{38}D_3N_7O_{20}P_3S \bullet 4NH_4$ **FW:** 983.8 **Chemical Purity:** ≥96%
Deuterium Incorporation: ≤1% d_0
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: Intended for use as an internal standard for the quantification of HMG-CoA by GC- or LC-MS

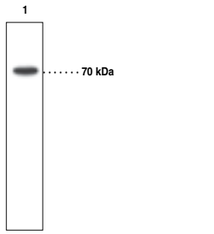
100 µg
500 µg
1 mg
5 mg



COX-1 Monoclonal Antibody (Clone CX111) 160110

Cyclooxygenase 1, PGHS-1, PGH Synthase 1
Lyophilized IgG **Stability:** ≥3 years at -20°C
Summary: Antigen: purified ovine COX-1 • Host: mouse, clone CX111 • Isotype: $IgG_{2\beta}$ • Cross Reactivity: (+) ovine, bovine, human, murine, rat, and monkey COX-1, ovine COX-2 (50%), and human COX-2 (~5%); (-) murine COX-2 • Application(s): IHC and WB • Constitutively expressed COX-1 is responsible for the production of PGs essential for the normal function of many organs including stomach and kidney.

1 ea



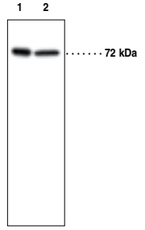
Lane 1: Ovine COX-1 (microsomal fraction)

•Also Available: **COX-1 Monoclonal FITC Antibody (Clone CX111)** (160111)
COX-1 Monoclonal PE Antibody (Clone CX111) (160120)
COX-1 (murine) Polyclonal Antibody (160109)
COX-1 (ovine) Polyclonal Antiserum (160108)

COX-2 Monoclonal Antibody (Clone CX229) 160112

Cyclooxygenase 2, PGHS-2, PGH Synthase 2
Lyophilized IgG **Stability:** ≥3 years at -20°C
Summary: Antigen: human COX-2 amino acids 580-599 • Host: mouse, clone CX229 • Isotype: IgG_1 • Cross Reactivity: (+) human, ovine, and monkey COX-2 (-) murine, rat, and rabbit COX-2 and COX-1 (all species) • Application(s): ICC, IHC, and WB • Expression of COX-2, the inducible form of COX, is regulated by growth factor tumors, tumor promoters, bacterial endotoxin, and cytokines.

1 ea



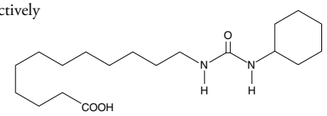
Lane 1: Recombinant human COX-2 (Cos-1 cell lysate)
Lane 2: Ovine COX-2 (microsomal fraction)

•Also Available: **COX-2 (human) Blocking Peptide** (360107)
COX-2 (human) Polyclonal Antibody (160107)
Goat Anti-COX-2 (human) Affinity-Purified Polyclonal Antibody (100034)
COX-2 Monoclonal FITC Antibody (Clone CX229) (160113)
COX-2 (murine) Blocking Peptide (360106)
COX-2 (murine) Polyclonal Antibody (160106)
COX-2 (murine) Polyclonal Antibody (160126)
COX-2 (murine) Polyclonal FITC Antibody (10010096)
COX-2 (murine) Polyclonal Antiserum (160116)

CUDA 10007923

[479413-68-8]
MF: $C_{19}H_{36}N_2O_3$ **FW:** 340.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An inhibitor of sEH exhibiting IC_{50} values of 11.1 and 112 nM for the murine and human enzymes, respectively

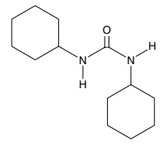
5 mg
10 mg
25 mg
50 mg



N,N'-Dicyclohexylurea 10004971

[2387-23-7] DCU, NSC 17013
MF: $C_{13}H_{24}N_2O$ **FW:** 224.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A selective sEH inhibitor with IC_{50} values of 160 and 90 nM for recombinant human and murine sEH, respectively; at 10 µM, blocks the hydrolysis of *cis*- and *trans*-EETs and completely inhibits 14(15)-EET-induced PPAR activation

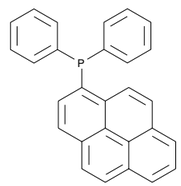
10 g
25 g
50 g
100 g



Diphenyl-1-pyrenylphosphine 62237

[110231-30-6] DPPP
MF: $C_{28}H_{19}P$ **FW:** 386.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A probe that reacts stoichiometrically with hydroperoxides to yield the fluorescent molecule DPPP-O; also a fluorescent probe for the detection of LDL and cellular oxidation

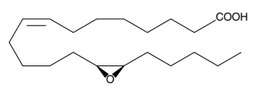
5 mg
10 mg
25 mg
50 mg



14,15-EE-8(Z)-E 10010486

[519038-93-8] 14,15-Epoxyeicosa-8(Z)-enoic Acid
MF: $C_{20}H_{36}O_3$ **FW:** 324.5 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A structural analog of 14(15)-EET that demonstrates potent vasodilator agonist activity in bovine coronary arteries similar to that of 14(15)-EET

25 µg
50 µg
100 µg
500 µg



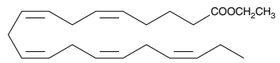
NOTE: relative stereochemistry shown in chemical structure

•Also Available: **14,15-EE-5(Z)-E** (10004946)

Eicosapentaenoic Acid ethyl ester 10008884

[86227-47-6] EPA-EE, EPA ethyl ester
MF: $C_{22}H_{34}O_2$ **FW:** 330.5 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A stabilized ethyl ester form of this ω-3 C20:5 PUFA; dietary EPA-EE in rats increases fatty acid β-oxidation enzyme levels, down-regulates lipogenic genes, and decreases plasma cholesterol and triglyceride levels; blocks induced insulin resistance and corrects changes in adiponectin levels and TNF-α expression in rats fed a high-fat diet

10 mg
50 mg
100 mg
500 mg



•Also Available: **Eicosapentaenoic Acid** (90110)
Eicosapentaenoic Acid-d_5 (10005056)
Eicosapentaenoic Acid (peroxide free) (90110.1)

ω-3 Fatty Acids

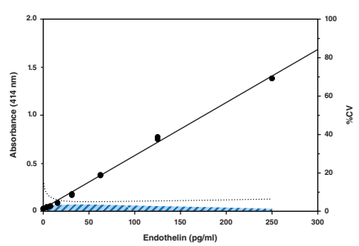
Item No.	Product Name	Sizes
90011	ω-3 Arachidonic Acid	1 mg • 5 mg • 10 mg • 25 mg
90310	Docosahexaenoic Acid	50 mg • 100 mg • 250 mg • 500 mg
90165	Docosapentaenoic Acid	1 mg • 5 mg • 10 mg • 100 mg
90170	Docosatrienoic Acid	10 mg • 25 mg • 50 mg • 100 mg
90110	Eicosapentaenoic Acid	50 mg • 100 mg • 250 mg • 500 mg
90210	α-Linolenic Acid	50 mg • 100 mg • 250 mg • 1 g
90320	Stearidonic Acid	1 mg • 5 mg • 25 mg

For a full product listing, please visit www.caymanchem.com

Endothelin EIA Kit 583151

ET
Stability: ≥6 months at -20°C
Limit of Detection: 7.8 pg/ml
Summary: The endothelin peptide family consists of three isoforms, ET-1 (corresponding to the initially isolated and most predominant isoform), ET-2, and ET-3. ET-1 is a 21 amino acid peptide and is one of the most potent vasoconstrictors currently known. ET-2 displays similar pharmacology to ET-1, whereas ET-3 is a weak vasoconstrictor but more potent inhibitor of platelet aggregation. Cayman's Endothelin Assay is an immunometric (*i.e.*, sandwich) EIA that permits endothelin measurements within the range of 0-250 pg/ml, typically with a limit of detection of 1.5 pg/ml. Inter- and intra-assay CV's of less than 10% may be achieved at most concentrations. This assay offers sensitive and specific analysis of endothelin in serum, plasma, urine, or cell culture media.

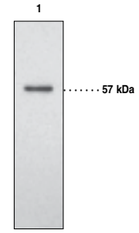
96 wells
480 wells



Endothelial Lipase Polyclonal Antibody 100030

EDL, EL
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human endothelial lipase amino acids 19-32 • Host: rabbit • Cross Reactivity: (+) human, murine, rat, porcine, and ovine endothelial lipase • Application(s): IHC and WB • EL is a major genetic determinant for the concentration, structure, and metabolism of HDL, which protects against atherosclerosis.

500 µl



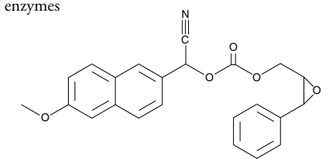
Lane 1: HepG2 cell lysate (~30 µg)

•Also Available: **Endothelial Lipase (human) Blocking Peptide** (10004111)

Epoxy Fluor 7 10008610

[863223-43-2]
MF: $C_{23}H_{19}NO_5$ **FW:** 389.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A sensitive fluorescent substrate for sEH that can be used to monitor the activity of both human and murine enzymes

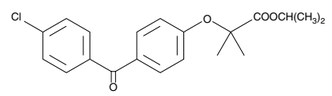
1 mg
5 mg
10 mg
50 mg



Fenofibrate 10005368

[49562-28-9]
MF: $C_{20}H_{21}ClO_4$ **FW:** 360.8 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A PPARα agonist and hypolipidemic drug used clinically to treat dyslipidemia and cardiovascular disease; exhibits EC_{50} values of 18 and 30 µM for murine and human PPARα, respectively

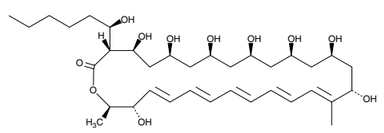
1 g
5 g
10 g
50 g



Filipin III 70440

[480-49-9]
MF: $C_{35}H_{58}O_{11}$ **FW:** 654.8 **Purity:** ≥85%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A fluorescent molecule that can be used to detect cholesterol by fluorescence and freeze-fracture electron microscopy

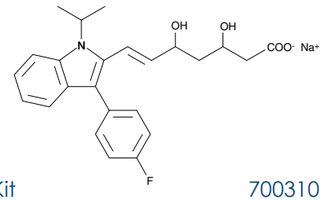
500 µg
1 mg
5 mg
10 mg



Fluvastatin (sodium salt) 10010337

[93957-55-2]
MF: $C_{24}H_{25}FNO_4$ • Na **FW:** 434.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent, competitive inhibitor of HMG-CoA reductase (K_i = 0.3 nM)

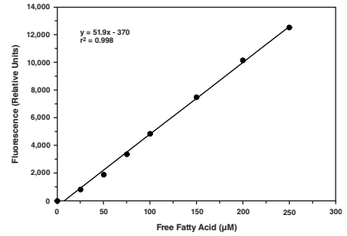
5 mg
10 mg
25 mg
50 mg



Free Fatty Acid Assay Kit 700310

FFA
Stability: ≥6 months at -20°C
Summary: The measurement of FFA can be useful in determining metabolic status. Cayman's FFA Assay provides a simple, reproducible, and sensitive tool for measuring FFA's in plasma, serum, and urine. The FFA Assay utilizes a coupled enzymatic reaction that results in generation of the highly fluorescent product resorufin.

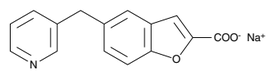
96 wells



Furegrelate (sodium salt) 70540

[85666-17-7] U-63557A
MF: $C_{15}H_{10}NO_3$ • Na **FW:** 275.2 **Purity:** ≥99%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent inhibitor of TX synthase (IC_{50} = 15 nM)

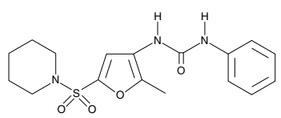
5 mg
10 mg
50 mg



GSK264220A 13009

[685506-42-7]
MF: $C_{17}H_{21}N_3O_4S$ **FW:** 363.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent inhibitor of endothelial lipase (IC_{50} = 16 nM)

1 mg
5 mg
10 mg
25 mg



Guanylate Cyclase α subunit (soluble) Polyclonal Antibody 160895

sGC α subunit
Affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human guanylate cyclase α subunit amino acids 418-436 • Host: rabbit • Cross Reactivity: (+) murine, human, and bovine guanylate cyclase α subunit • Application(s): WB • Soluble guanylate cyclase is a heterodimeric enzyme, composed of α and β subunits, that synthesizes cGMP from GTP. The enzyme is activated by the binding of nitric oxide or carbon monoxide to the heme group of the enzyme.

500 µl

•Also Available: **Guanylate Cyclase α_1 subunit (soluble) Blocking Peptide** (360895)

Guanylate Cyclase β_1 subunit (soluble) Polyclonal Antibody 160897

sGC β_1 subunit
Affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: rat soluble guanylate cyclase β_1 subunit amino acids 188-207 • Host: rabbit • Cross Reactivity: (+) most mammalian species • Application(s): IHC and WB • Soluble guanylate cyclase is a heterodimeric enzyme, composed of α and β subunits, that synthesizes cGMP from GTP. The enzyme is activated by the binding of nitric oxide or carbon monoxide to the heme group of the enzyme.

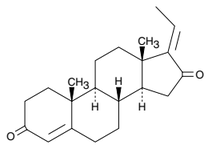
500 µl

•Also Available: **Guanylate Cyclase β_1 subunit (soluble) Blocking Peptide** (360897)

(E)-Guggulsterone 10011296

[39025-24-6]
MF: $C_{21}H_{28}O_2$ **FW:** 312.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A competitive antagonist of FXR (IC_{50} = 15 µM) that inhibits chenodeoxycholic acid (CDCA)-induced transactivation of FXR; lowers LDL cholesterol and triglyceride levels in rodents fed a high cholesterol diet

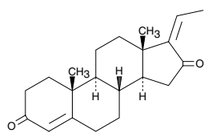
5 mg
10 mg
25 mg
50 mg



(Z)-Guggulsterone 71800

[39025-23-5]
MF: $C_{21}H_{28}O_2$ **FW:** 312.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A competitive antagonist of FXR (IC_{50} = 17 µM) that lowers LDL cholesterol and triglyceride levels in rodents fed a high cholesterol diet; demonstrates antitumor-promoting effects in human multiple myeloma and DU145 human prostate cancer cells

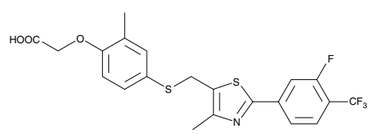
5 mg
10 mg
25 mg
50 mg



GW 0742 10006798

[317318-84-6]
MF: $C_{21}H_{17}F_4NO_3S_2$ **FW:** 471.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A selective PPARδ agonist (EC_{50} = 1.1 nM) that exhibits 1,000-fold selectivity over the other human PPAR subtypes

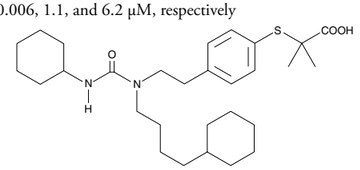
5 mg
10 mg
25 mg
50 mg



GW 7647 10008613

[265129-71-3]
MF: $C_{29}H_{46}N_2O_3S$ **FW:** 502.8 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent, selective PPARα agonist; activates human PPARα, PPARγ, and PPARδ with EC_{50} values of 0.006, 1.1, and 6.2 µM, respectively

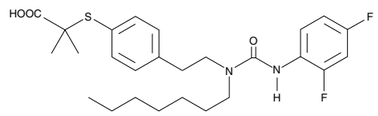
1 mg
5 mg
10 mg
25 mg



GW 9578 10011211

[247923-29-1]
MF: $C_{26}H_{34}F_2N_2O_3S$ **FW:** 492.6 **Purity:** ≥98%
A solution in methyl acetate **Stability:** ≥1 year at -20°C
Summary: A potent, selective PPARα agonist that activates the murine and human receptor with EC_{50} values of 0.005 and 0.05 µM, respectively; 0.2 mg/kg given orally once daily for three days decreased serum total LDL cholesterol 40-60% in male Sprague-Dawely rats

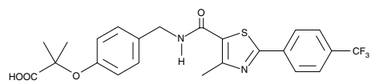
500 µg
1 mg
5 mg
10 mg



GW 590735 10009880

[622402-22-6]
MF: $C_{23}H_{21}F_3N_2O_4S$ **FW:** 478.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent and selective PPARα agonist (EC_{50} = 4 nM) that is at least 500-fold selective for PPARα over PPARγ and PPARδ

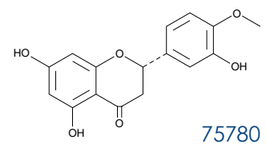
1 mg
5 mg
10 mg
25 mg



Hesperetin 10006084

[520-33-2]
MF: $C_{16}H_{14}O_6$ **FW:** 302.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A citrus flavonoid that lowers plasma cholesterol; reduces the transcription of ACAT-2 mRNA in HepG2 cells and reduces ApoB protein synthesis (EC_{50} ~ 50 µM)

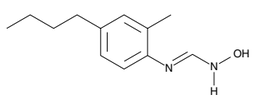
25 g
50 g
100 g
500 g



HET0016 75780

[339068-25-6] N-hydroxy-N'-(4-n-butyl-2-methylphenyl)Formamidine
MF: $C_{12}H_{18}N_2O$ **FW:** 206.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An inhibitor of 20-HETE formation in human renal microsomes with an IC_{50} value of 8.9 nM, selectively inhibiting CYP4A and 4F isoforms

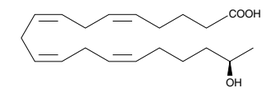
1 mg
5 mg
10 mg
100 mg



19(R)-HETE 10007767

[115461-39-7]
MF: $C_{20}H_{32}O_3$ **FW:** 320.5 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A major CYP450 metabolite of arachidonic acid that is released from the kidney in response to angiotensin II; a potent vasodilator of renal preglomerular vessels; blocks 20-HETE-induced vasoconstriction of renal arterioles at 1 µM

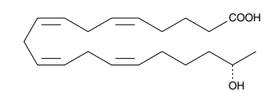
25 µg
50 µg
100 µg
500 µg



19(S)-HETE 10007766

[115461-40-0]
MF: $C_{20}H_{32}O_3$ **FW:** 320.5 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A major CYP450 metabolite of arachidonic acid that is released from the kidney in response to angiotensin II; a potent vasodilator of renal preglomerular vessels

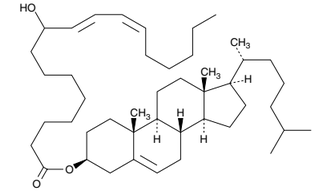
25 µg
50 µg
100 µg
500 µg



(±)9-HODE cholesteryl ester 38401

[33783-76-5]
MF: $C_{45}H_{76}O_3$ **FW:** 665.1 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A racemic monohydroxy fatty acid cholesteryl ester found in atherosclerotic lesions

25 µg
50 µg
100 µg
250 µg

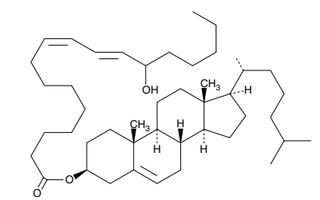


•Also Available: **9(R)-HODE cholesteryl ester** (38406)
9(S)-HODE cholesteryl ester (38411)

(±)13-HODE cholesteryl ester 38601

[167354-91-8]
MF: $C_{45}H_{76}O_3$ **FW:** 665.1 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A racemic monohydroxy fatty acid cholesteryl ester found in atherosclerotic lesions

25 µg
50 µg
100 µg
500 µg



•Also Available: **13(R)-HODE cholesteryl ester** (38606)
13(S)-HODE cholesteryl ester (38611)

vol. 12
Cd

Thomas G. Brock, Ph.D.

You Say 'Thrombosis', I Say 'Thromboxane'

A blood clot that forms internally, in a blood vessel, looks different from the familiar scab that closes the laceration on your skin. Clots in the blood form lumps suggestive of curdling of the blood, if such a thing could happen. For this reason, it makes sense that such a clot is called a 'thrombus', after the Greek word thrombos, a lump or curd. Thrombosis, then, is simply the formation or presence of a blood clot in a blood vessel, which may be any vein or artery. An important early step in the formation of the thrombus is the aggregation of platelets at the blood vessel wall. One mediator that potently promotes platelet activation and aggregation is thromboxane A_2. (TXA_2). This article touches on the interrelationship of thromboxane and thrombi in certain types of thrombosis.

Thrombosis

The formation of the primary platelet plug in the damaged blood vessel is called primary hemostasis. The healthy endothelium inhibits platelet activation by secreting nitric oxide (NO) and prostaglandin I_2 (PGI_2, or prostacyclin). However, disruption of the endothelial barrier through injury or disease exposes elements of the subendothelium to which platelets can adhere, including von Willebrand factor (vWf), glycoproteins, and extracellular matrix proteins (Figure 1). The binding of platelets is facilitated by fibrinogen. Adhesion of platelets to the vessel wall causes platelet activation, characterized by the release of pre-formed mediators from granules and the rapid synthesis of thromboxane A_2 (TXA_2) and platelet activating factor (PAF). These potently activate additional platelets and drive platelet aggregation, as well as vasoconstriction. With fibrinogen, aggregating platelets form a primary platelet plug, which is stabilized by the formation of fibrin through the coagulation cascade (a portion of secondary hemostasis). Continued coagulation produces a mesh of insoluble cross-linked fibrin, interspersed with plug remnants, that forms the core of the clot. Normally, clots are broken down by plasmin, which degrades the cross-linked fibrin. This depends on plasminogen activators, like tissue plasminogen activator (tPA), converting plasminogen to plasmin, which mediates fibrinolysis. Interestingly, many of the factors that are necessary for clot removal are produced by the healthy endothelium, so that the clot will not be removed until the initial damage to the endothelium is repaired.

The term 'hemostasis' literally refers to a balance, maintained in the blood, between clotting, anticoagulant, and fibrinolytic forces. Because the processes that contribute to this balance are complex, there are many genetic, acquired, and environmental factors that can tip the balance in favor of coagulation and cause the pathologic formation of thrombi. These can occur in arteries, veins, or cardiac chambers. Clots in arteries interfere with the delivery of oxygen to tissues, producing outcomes like myocardial infarction or ischemic stroke. Venous thrombosis commonly involves the activation of coagulation in vessels with reduced blood flow. The thrombus can interfere with blood flow at the site of formation, cause inflammation (phlebitis), or it can break free from the vessel wall and travel through the bloodstream as a thromboembolism, blocking a distant blood vessel. Death from deep vein thrombosis is usually due to massive pulmonary embolism, which causes some 300,000 deaths annually in the United States.

Thromboxane

Given the pivotal role of platelet plug formation in initiating clotting, current therapies focusing on the prevention of thrombosis seek to block platelet activation and aggregation. Clopidogrel blocks low affinity ADP receptors on platelets, preventing fibrinogen binding, short-circuiting the clotting process. While efficacious in a large percentage of individuals, there remain many for whom clopidogrel does not work. Moreover, the production of TXA_2 can be increased in people with type II diabetes,[1] and clopidogrel does not solve this problem.

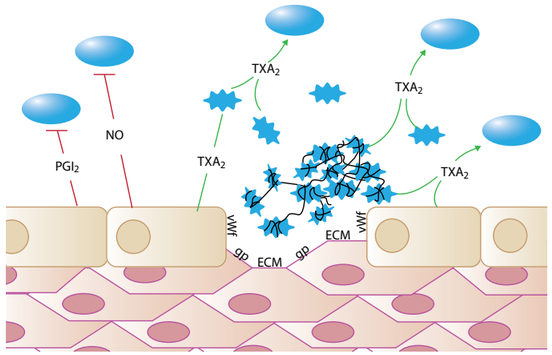


Figure 1. Healthy endothelium produces PGI_2 and NO, which suppresses platelet activation. Disruption of the endothelium reveals von Willebrand factor (vWf), glycoproteins (gp), and extracellular matrix (ECM), which induce platelets to change shape, aggregate, and release mediators, including TXA_2. TXA_2 from activated platelets triggers additional platelet activation and aggregation.

TXA_2 is a lipid messenger derived by the enzymatic modification of arachidonic acid (AA), a polyunsaturated fatty acid that is stored in all cellular membranes, including those of platelets (Figure 2). Upon platelet activation, AA is released in abundance by cytosolic phospholipase A_2 ($cPLA_2$), an enzyme that specifically targets membrane phospholipids containing AA. Cyclooxygenase-1 (COX-1) and COX-2 isozymes catalyze the conversion of AA to prostaglandin $(PG)H_2$, the initial step in the synthesis of TXA_2, PGI_2, and other primary prostaglandins. COX-1 is constitutively expressed in many cell types and, because of the stability of the protein, remains in platelets long after their formation from megakaryocytes. The expression of COX-2, on the other hand, is induced by inflammatory mediators and the enzyme typically has a relatively short half-life. Platelets typically lack COX-2. While most non-steroidal anti-inflammatory drugs (NSAIDs) reversibly inhibit both COX isoforms, aspirin inactivates them irreversibly. Coxibs selectively inhibit COX-2. Because platelets lack nuclei and cannot synthesize new COX-1, low-dose aspirin is sufficient to permanently inactivate COX-1 in platelets, preventing the formation of TXA_2 that drives platelet activation and aggregation. This treatment is particularly effective in the prevention of arterial thrombi, which potentially contribute to heart attack and stroke. TXA_2 synthase (TXAS) completes the synthesis of TXA_2 from PGH_2. TXA_2 has a half-life of about 30 seconds in plasma and is non-enzymatically hydrolyzed to TXB_2, which is functionally inactive.

The focus above is largely on platelets as both the producers and responders of TXA_2. Importantly, other cells, including endothelial cells and leukocytes, can synthesize TXA_2. More importantly, neighboring cells can cooperate in the synthesis: if platelets do not use AA to make TXA_2, they can donate the AA to nearby cells, which can then use it to produce lipid mediators, including TXA_2, PGI_2, and PGE_2. These products are then secreted, acting on platelets and adjacent cells. Such 'transcellular' synthesis may be particularly effective in the smaller vessels, where circulation slows and cells of different types are in close proximity.

Thromboxane Receptors

In general terms, most of the primary COX products, including TXA_2, activate G protein-coupled receptors (GPCR) at the cell surface. The binding pocket for GPCRs is typically deep in the membrane, defined by a few of the seven transmembrane domains of the receptor. Importantly, the binding pocket of each GPCR is highly selective for each ligand. As a result, TXA_2 binds one receptor, called the 'T prostanoid' (TP) receptor, which has two isoforms (TPα and TPβ). As with other GPCRs, agonist binding produces a change in receptor conformation, exposing intracellular sites involved in the interaction with the G protein. The G protein, consisting of α, β, and γ subunits, interacts with the receptor, leading to the release of guanosine diphosphate (GDP) from the Gα subunit and its replacement with guanosine triphosphate (GTP). The binding of GTP activates Gα so that it dissociates from the Gβγ dimer and triggers a Gα-specific pathway. Both TPα and TPβ act primarily through Gαq, which activates phospholipase Cβ, hydrolyzing phosphatidylinositol-4,5-bisphosphate (PIP_2) to generate diacylglycerol (DAG) and inositol-1,4,5-trisphosphate (IP_3). These mediators lead to a transient increase in intracellular calcium and activate certain isoforms of protein kinase C (PKC) and various calmodulin-dependent enzymes (*e.g.*, kinases, NOS). Both TPα and TPβ can also act through Gα12-RhoA, activating Rho-associated protein kinase (ROCK), which is particularly important in regulating cytoskeletal components involved in contractility, mobility, and mitosis.

Both TPα and TPβ are derived from a single gene but are the product of unique mRNAs whose expressions are controlled by distinct promoters that are differentially regulated.[2,3] Structurally, the two receptor isoforms are identical except for the carboxy tails: fifteen residues at the terminus of TPα are replaced with a much longer segment of 79 amino acids in TPβ (Figure 3). These variants offer unique sites for phosphorylation and desensitization of each isoform. For example, elevation of cytoplasmic cAMP levels activates protein kinase A (PKA), which phosphorylates Ser^{329} and Ser^{331} on TPα, leading to desensitization of the receptor.[4,5] Different amino acids are present at these sites on TPβ, so this receptor isoform is not affected by changes in cellular cAMP levels. Similarly, Ser^{331} is targeted by protein kinase G (PKG), which is activated by cGMP, an effector of NO, only on TPα.[4] Interestingly, both isoforms are desensitized by PKC, although different residues are phosphorylated (Thr^{337} on TPα, Thr^{399} on TPβ).[5] Much more information on the TP isoforms is available.[6]

Modulating Thromboxane Signaling

The central role of platelets in thrombus formation drives the focus on antiplatelet therapy. The standard approach, as mentioned above, is aspirin therapy, which is simple and well-tested. However, any antiplatelet therapy balances the benefits of clot prevention with a risk of bleeding. The benefits of aspirin as a prophylactic approach against a secondary event (*e.g.*, against recurrence of infarct) clearly outweighs the bleeding risk. Unfortunately, in trials of primary prevention, the benefits of this COX inhibitor only marginally outweigh the risks.[7] Similar problems exist for flavonoids (*e.g.*, apigenin, luteolin, quercetin), which have antiplatelet effects through inhibition of the COX pathway.

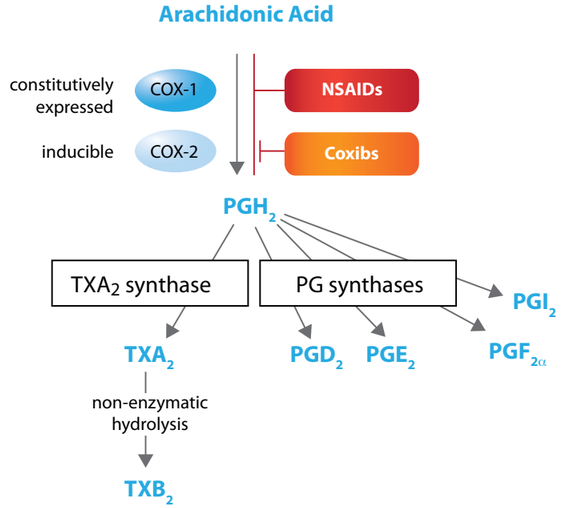


Figure 2. COX-1 and COX-2 convert arachidonic acid to the intermediate PGH_2, which is then metabolized by specific distal enzymes to produce the different PGs. For example, TXA_2 synthase hydrolyzes PGH_2 to give TXA_2. TXA_2 is rapidly hydrolyzed non-enzymatically to TXB_2.

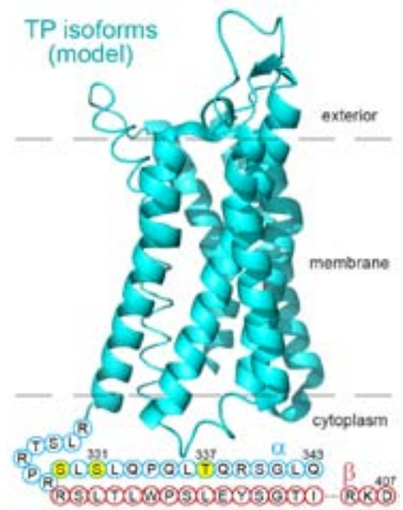


Figure 3. A model of the TP receptor isoforms, showing the critical region that differs between TPα (cyan) and TPβ (red). Key residues that are phosphorylated on TPα are highlighted in yellow.

TX blockers, blocking either TXA_2 synthase activity or TP receptors, allow the biosynthesis of other COX pathway products, most notably PGI_2. Moreover, TXA_2 synthase inhibitors prevent the generation of TXA_2 in sources other than platelets. Potent inhibitors of TXA_2 synthase, TP receptors, as well as dual inhibitors, are available from Cayman (Table 1). Similar compounds are being tested or used as antithrombotic agents in the treatment of peripheral arterial disease (PAD), PAD with type 2 diabetes, and stroke.

Inhibitors and Antagonists		
Item No.	**Product Name**	
70540	**Furegrelate (sodium salt)**	Inhibitor of human platelet TXA_2 synthase (IC_{50} = 15 nM)
70515	**Ozagrel**	Selective inhibitor of TXA_2 synthase (IC_{50} = 11 nM)
19025	**SQ 29,548**	Potent antagonist of the TP receptor: K_i of 4.1 nM
10011562	**L-655,240**	Potent antagonist of the TP receptor *in vitro* (IC_{50} = 7 nM)
10010396	**CAY10535**	TP receptor antagonist, with selectivity for TPβ (IC_{50} = 99 nM) over TPα (IC_{50} = 1,970 nM)
10155	**BM 567**	A dual acting antithrombogenic agent, acting as an inhibitor of TXA_2 synthase (IC_{50} = 12 nM) and as an antagonist of the TP receptor (IC_{50} = 1.1 nM)
For a full product listing, please visit www.caymanchem.com		

References

1. Davì, G., Catalano, I., Averna, M., *et al. N. Engl. J. Med.* **322,** 1769-1774 (1990).
2. Coyle, A.T. and Kinsella, B.T. *Biochem. Pharmacol.* **71,** 1308-1323 (2006).
3. Gannon, A.M.M., Turner, E.C., Reid, H.M., *et al. J. Mol. Biol.* **3394,** 29-45 (2009).
4. Yamamoto, S., Yan, F., Zhou, H., *et al. Biochem. Pharmacol.* **64,** 375-383 (2002).
5. Reid, H.M. and Kinsella, B.T. *J. Biol. Chem.* **278(51),** 51190-51202 (2003).
6. Kelley-Hickie, L.P., O'Keeffe, M.B., Reid, H.M., *et al. Biochem. Biophys. Acta* **1773(6),** 970-989 (2007).
7. Kelley-Hickie, L.P. and Kinsella, B.T. *Br. J. Pharmacol.* **142,** 203-221 (2004).
8. Nakahata, N. *Pharmacol. Ther.* **118,** 18-35 (2008).
9. Coccheri, S. *Drugs* **70(7),** 887-908 (2010).

Hormone Sensitive Lipase (human recombinant) 10664

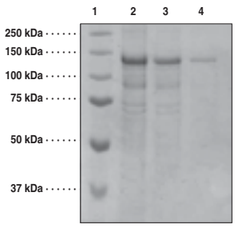
HSL

M_r: 118.3 kDa **Purity:** ≥80%

Supplied in: 50 mM sodium phosphate, pH 7.2, containing 100 mM sodium chloride and 20% glycerol

Source: Recombinant N-terminal His-tagged protein, expressed in *Sf*21 insect cells using a baculovirus expression system

25 µg
50 µg
100 µg



Lane 1: MW Markers
Lane 2: Purified HSL (5 µg)
Lane 3: Purified HSL (2.5 µg)
Lane 4: Purified HSL (1.25 µg)

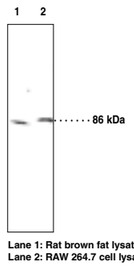
Hormone Sensitive Lipase Polyclonal Antibody 10006371

HSL

Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C

Summary: Antigen: synthetic peptide from human HSL amino acids 731-741 • Host: rabbit • Cross Reactivity: (+) human, murine, and rat HSL • Application(s): WB • HSL catalyzes the hydrolysis of tri-, di-, and monoacylglycerols, as well as cholesterol esters.

500 µl



Lane 1: Rat brown fat lysate (40 µg)
Lane 2: RAW 264.7 cell lysate (40 µg)

13(S)-HOTrE 39620

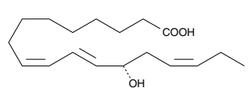
[87984-82-5]

MF: $C_{18}H_{30}O_3$ **FW:** 294.4 **Purity:** ≥98%

A solution in ethanol **Stability:** ≥2 years at -20°C

Summary: 15-LO product of linolenic acid; detected in cell membranes and as the cholesteryl ester associated with atherosclerotic lesions

100 µg
500 µg
1 mg
5 mg



HTS 01037 10699

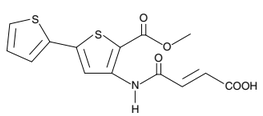
[682741-29-3]

MF: $C_{14}H_{11}NO_5S_2$ **FW:** 337.4 **Purity:** ≥98%

A crystalline solid **Stability:** ≥2 years at -20°C

Summary: A high-affinity ligand of FABP4 (K_i = 0.67 µM) that has been shown to antagonize the protein-protein interaction of FABP4 with hormone sensitive lipase in cultured C8PA lipocytes; it presumably competes with fatty acids for functional binding in the ligand-binding cavity of FABP4

1 mg
5 mg
10 mg
25 mg



I-BOP 19600

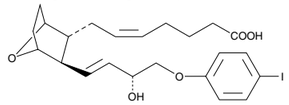
[128719-90-4]

MF: $C_{23}H_{29}IO_5$ **FW:** 512.4 **Purity:** ≥95%*

A solution in ethanol **Stability:** ≥2 years at -20°C

Summary: A potent TP receptor agonist; induces human platelet aggregation with EC_{50} values of 0.34 and 0.17 nM at pH 7.4 and pH 6.0, respectively

100 µg
500 µg
1 mg
5 mg



Iloprost 18215

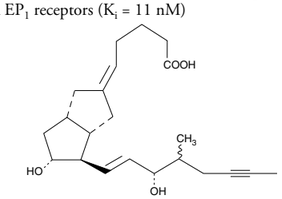
[78919-13-8] Ciloprost

MF: $C_{22}H_{32}O_4$ **FW:** 360.5 **Purity:** ≥97%

A solution in methyl acetate **Stability:** ≥1 year at -20°C

Summary: A second generation structural analog of prostacyclin; binds with equal affinity to the human recombinant IP and EP_1 receptors (K_i = 11 nM)

500 µg
1 mg
5 mg
10 mg



IP Receptor (human) Polyclonal Antibody 10005518

PGI_2 Receptor, PGI_2 Receptor, Prostacyclin Receptor

Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C

Summary: Antigen: human IP receptor N-terminal amino acids 1-16 • Host: rabbit • Cross Reactivity: (+) human, murine, and rat IP receptor • Application(s): WB • The PGI_2 receptor participates in signal transduction of the pain response, cardioprotection, and inflammation.

500 µl

• Also Available: **IP Receptor (human) Blocking Peptide** (10005519)

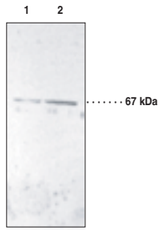
IP Receptor (murine) Polyclonal Antibody 160070

PGI_2 Receptor, PGI_2 Receptor, Prostacyclin Receptor

Peptide affinity-purified IgG **Stability:** ≥2 years at -20°C

Summary: Antigen: murine IP receptor N-terminal amino acids 3-16 • Host: rabbit • Cross Reactivity: (+) murine and rat IP receptor; (-) human IP receptor • Application(s): WB • The IP receptor mediates the vasorelaxation and anti-platelet aggregation effects of prostacyclin (PGI_2)

500 µl



Lane 1: Murine brain homogenate (40 µg)
Lane 2: Murine brain homogenate (80 µg)

• Also Available: **IP Receptor (murine) Blocking Peptide** (360070)

**All 5-cis 2-series PGs (those containing a 5,6-double bond) will contain a small amount of the 5-trans isomer. This isomer is generally undetectable using normal phase silica columns and plates, but may be resolved using RP-HPLC. The purity for all such 2-series PGs excludes the 1-3% trans isomer which will generally be present.*

IP and TP Receptors Agonists and Antagonists

Item No.	Product Name	Target	Mode of Action	Effective Concentration	Sizes
18230	Beraprost (sodium salt)	IP	Agonist	Doses of 20-100 µg are effective in humans	1 mg • 5 mg • 10 mg • 50 mg
10155	BM 567	TP	Antagonist	IC_{50} = 1.1 nM	1 mg • 5 mg • 10 mg • 50 mg
18210	Carbaprostacyclin	IP	Agonist	ED_{50} = 47 nM for inhibition of platelet aggregation	500 µg • 1 mg • 5 mg • 10 mg
19010	Carbocyclic Thromboxane A_2	TP	Agonist	1 nM effectively constricts cat coronary arteries	100 µg • 500 µg • 1 mg • 5 mg
10005186	CAY10441	IP	Antagonist	K_i = 1.5 nM	1 mg • 5 mg • 10 mg • 25 mg
10005913	CAY10449	IP	Antagonist	K_i = 3 nM	1 mg • 5 mg • 10 mg • 25 mg
10010396	CAY10535	TP	Antagonist	IC_{50} = 99 nM (TPβ); IC_{50} = 1,970 nM (TPα)	1 mg • 5 mg • 10 mg • 50 mg
10012447	CG 4305	IP	Agonist	EC_{25} = 25 nM for inhibition of platelet aggregation	100 µg • 500 µg • 1 mg • 5 mg
18216	Ciprostene (calcium salt)	IP	Agonist	ID_{50} = 60 ng/ml for inhibition of ADP-induced platelet aggregation *in vitro*	1 mg • 5 mg • 10 mg • 50 mg
19600	I-BOP	TP	Agonist	EC_{50} = 0.34 nM (pH 7.4); 0.174 nM (pH 6.0)	100 µg • 500 µg • 1 mg • 5 mg
18215	Iloprost	IP	Agonist	K_i = 11 nM (binds with equal affinity to EP_1 receptor)	500 µg • 1 mg • 5 mg • 10 mg
19021	I-SAP	TP	Antagonist	K_d = 0.5 nM (human platelets)	100 µg • 500 µg • 1 mg • 5 mg
10011562	L-655,240	TP	Antagonist	IC_{50} = 7 nM	500 µg • 1 mg • 5 mg • 10 mg
10010412	mRE-269	IP	Agonist	K_i = 20 nM	1 mg • 5 mg • 10 mg • 50 mg
19020	Pinane Thromboxane A_2	TP	Antagonist	IC_{50} = 2 µM for inhibition of U-46619-induced aggregation of human platelets	500 µg • 1 mg • 5 mg • 10 mg
18220	Prostaglandin I_2 (sodium salt)	IP	Agonist	IC_{50} = 5 nM for inhibition of human platelet aggregation	1 mg • 5 mg • 10 mg • 25 mg
19025	SQ 29,548	TP	Antagonist	K_i = 4.1 nM	1 mg • 5 mg • 10 mg • 100 mg
10011348	Taprostene	IP	Agonist		500 µg • 1 mg • 5 mg • 10 mg
16440	U-44069	TP	Agonist	EC_{50} = 3 µM for platelet aggregation	1 mg • 5 mg • 10 mg • 50 mg
16450	U-46619	TP	Agonist	EC_{50} = 82 nM for human platelet aggregation	1 mg • 5 mg • 10 mg • 50 mg

For a full product listing, please visit www.caymanchem.com

I-SAP 19021

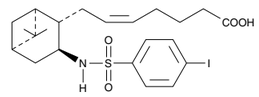
[133538-58-6] Iodophenyl sulfonyl amino pinane TXA_2

MF: $C_{22}H_{30}INO_4S$ **FW:** 531.4 **Purity:** ≥98%*

A solution in ethanol **Stability:** ≥2 years at -20°C

Summary: A high-affinity TP receptor antagonist; produces platelet shape change, but not aggregation, with an EC_{50} value of 9.7 nM

100 µg
500 µg
1 mg
5 mg



KB2115 10011054

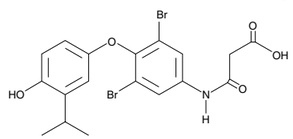
[355129-15-6]

MF: $C_{18}H_{17}Br_2NO_5$ **FW:** 487.1 **Purity:** ≥98%

A crystalline solid **Stability:** ≥2 years at -20°C

Summary: A synthetic thyroid hormone mimetic that lowers total and LDL cholesterol up to 40% when administered to humans at a dose of 50-200 µg once daily for 14 days; stimulates cholesterol catabolism to bile acids without affecting cholesterol synthesis

500 µg
1 mg
5 mg
10 mg



KDdiA-PC 62935

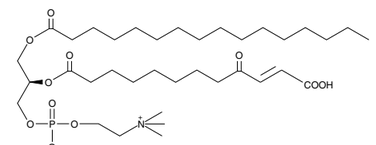
[439904-34-4]

MF: $C_{36}H_{66}NO_{11}P$ **FW:** 719.9 **Purity:** ≥98%

A solution in ethanol **Stability:** ≥1 year at -20°C

Summary: A phosphatidylcholine species containing a fragmented, oxidized short-chain fatty acid remnant at the *sn*-2 position; acts as a potent CD36 ligand

500 µg
1 mg
5 mg
10 mg



KOdiA-PC 62945

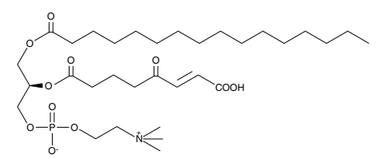
[439904-33-3]

MF: $C_{32}H_{58}O_{11}P$ **FW:** 663.8 **Purity:** ≥98%

A solution in ethanol **Stability:** ≥1 year at -20°C

Summary: A phosphatidylcholine species containing a fragmented, oxidized short-chain fatty acid remnant at the *sn*-2 position; acts as a potent CD36 ligand

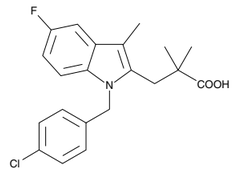
500 µg
1 mg
5 mg
10 mg



L-655,240 10011562

[103253-15-2]
MF: $C_{21}H_{21}ClFNO_2$ **FW:** 373.9 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent antagonist of the TXA_2 receptor (IC_{50} = 7 nM); blocks TP-mediated bronchoconstriction *in vivo* and platelet aggregation *ex vivo*

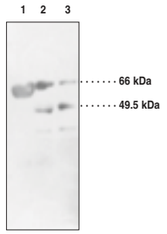
500 µg
1 mg
5 mg
10 mg



LCAT Polyclonal Antibody 10009323

Lecithin:Cholesterol Acyltransferase, Phosphatidylcholine-Sterol O-Acyltransferase
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human LCAT amino acids 132-143 • Host: rabbit • Cross Reactivity: (+) human, murine, porcine, and bovine LCAT • Application(s): WB • LCAT catalyzes the fatty acid transfer from the *sn*-2 position of phosphatidylcholine (lecithin) to cholesterol and to a lesser degree to other acceptor molecules. This enzyme is critical to the process of reverse cholesterol transport or movement of cholesterol esters into HDL paricles from cells.

500 µl



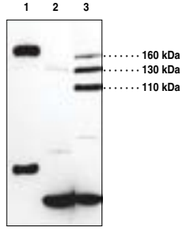
Lane 1: Human plasma (20 µg)
Lane 2: Human plasma minus albumin (10 µg)
Lane 3: Human plasma minus albumin (5 µg)

•Also Available: **LCAT Blocking Peptide** (10009324)

LDL Receptor Polyclonal Antibody 10007665

LDLR
Affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: Synthetic peptide from murine LDL receptor amino acids 499-511 • Host: rabbit • Cross Reactivity: (+) human, murine, and rat LDL receptor• Application(s): ICC and WB • The LDLRs are cell surface glycoproteins that scavenge LDL from the blood and regulate plasma LDL cholesterol.

500 µl



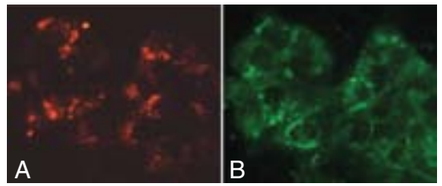
Lane 1: Rat placenta homogenate (60 µg)
Lane 2: Murine liver homogenate (60 µg)
Lane 3: RAW 264.7 cell lysate (60 µg)

•Also Available: **LDL Receptor Blocking Peptide** (10007672)

LDL Uptake Cell-Based Assay Kit 10011125

Stability: ≥6 months at 4°C
Summary: LDL uptake and its regulation are important therapeutic targets for atherosclerosis and related diseases. Cayman's LDL Uptake Cell-Based Assay employs a preparation of human LDL conjugated to Dylight™ 549 as a fluorescent probe for detection of LDL uptake into cultured cells. A LDL receptor-specific antibody and a Dylight™ 488-conjugated secondary antibody are included in the kit for identifying the distribution of LDL receptors.

1 ea



LDL Uptake in HepG2 cells. HepG2 cells were cultured for two days and then treated with 32 µM EGCG overnight. *Panel A:* LDL-DyLight™ 549 taken into cells appear in red. *Panel B:* LDL receptors in green show a distribution pattern that matches cells in Panel A containing LDL-DyLight™ 549.

Leukotriene A_4 Hydrolase (human recombinant) 10007817

LTA_4H
M_r: 69.3 kDa **Purity:** ≥90%
Supplied in: 100 mM Tris, pH 8.0, containing 100 mM potassium chloride and 20% glycerol **Source:** Recombinant C-terminal His-tagged enzyme expressed in *E. coli* • LTA_4 hydrolase is a bifunctional zinc metalloenzyme that converts LTA_4 into LTB_4.

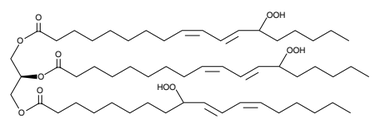
25 µg
50 µg
100 µg

•Also Available: **LTA_4 Hydrolase Polyclonal Antibody** (160250)

Linolein Hydroperoxides 89430

Purity: ≥98% (A mixture of 132 isomers)
A solution in ethanol **Stability:** ≥2 years at -80°C
Summary: A mixture of 132 possible isomers of mono-, di-, and tri-hydroperoxides produced from the autoxidation of trilinolein; may contribute to the pathophysiology of atherosclerosis when present in the circulation

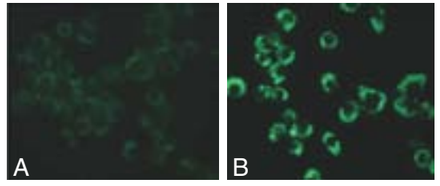
500 µg
1 mg
5 mg
50 mg



Lipid Droplets Fluorescence Assay Kit 500001

Stability: ≥1 year at -20°C
Summary: Lipid droplets are a fundamental component of intracellular lipid homeostasis in all cell types and they provide a rapidly mobilized lipid source for many important biological processes. Cayman's Lipid Droplets Fluorescence Assay can be used to study regulators of lipid droplet biogenesis. The main advantage of this assay is that the green fluorescence of Nile Red is both very sensitive and specific for lipid droplet detection.

480 tests



Oleic Acid dramatically induces lipid droplet accumulation in neuro-2a cells. Neuro-2a cells were treated with vehicle (control, *Panel A*) or 400 µM oleic acid (treated, *Panel B*). In cells cultured with MEM medium only, there are few cells with tiny lipid droplets (*Panel A*). When cells were fed with 400 µM oleic acid , most of cells accumulated numerous large lipid droplets (*Panel B*).

5-Lipoxygenase (human recombinant) 60402

M_r: 78 kDa **Purity:** Cell lysate 16,000 x g supernatant
Supplied in: 100 mM Tris, pH 8.0, containing 5 mM EGTA
Source: Recombinant enzyme isolated from a Baculovirus overexpression system in *Sf*21 cells

500 units
1 Kunit
2.5 Kunit
5 Kunit

5-Lipoxygenase Polyclonal Antibody 160402

5-LO
Peptide affinity-purified IgG **Stability:** ≥2 years at -20°C
Summary: Antigen: human and rat amino acids 130-149; The sequence is 95% homologous to 5-LO from mouse and hamster • Host: rabbit • Cross Reactivity: (+) human, rat, murine, hamster, and porcine 5-LO; (-) 12-LO and 15-LO • Application(s): ICC, IHC, and WB • 5-LO catalyzes the formation of 5(S)-HpETE from arachidonic acid as well as its subsequent conversion to LTA_4.

500 µl

Lane 1: Porcine leukocyte 100,000 x g supernatant

•Also Available: **5-Lipoxygenase Blocking Peptide** (360402)

5-Lipoxygenase (Phospho-Ser[523]) Polyclonal Antibody 10007820

Stability: ≥1 year at -20°C
Summary: Antigen: phosphopeptide corresponding to amino acid residues surrounding the phospho-Ser[523] of human 5-LO • Host: rabbit • Cross Reactivity: (+) human, rat, and non-human primate 5-LO • Application: WB • The 5-LO enzyme plays a key role in regulating the production of LTs. Its activity is regulated by PKA phosphorylation at serine-523.

1 ea

12-Lipoxygenase (murine leukocyte) Polyclonal Antiserum 160304

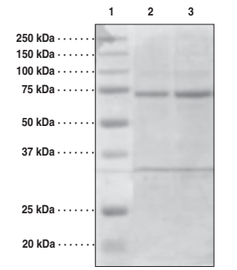
Lyophilized antiserum **Stability:** ≥2 years at -20°C
Summary: Antigen: recombinant murine leukocyte 12-LO • Host: rabbit • Cross Reactivity: (+) murine, porcine, and human leukocyte 12-LO and rabbit reticulocyte 15-LO • Application(s): WB

1 ea

12-Lipoxygenase (platelet-type, murine recombinant) 10341

12-LO
M_r: 76.4 kDa **Purity:** ≥85%
Supplied in: 50 mM sodium phosphate, pH 7.2, containing 100 mM sodium chloride, 20 µM ferrous chloride, and 30% glycerol
Source: Recombinant N-terminal His-tagged protein, expressed in *Sf*21 cells using a Baculovirus overexpression system

10 µg
25 µg
50 µg



Lane 1: MW Markers
Lane 2: Purified 12-LO (2 µg)
Lane 3: Purified 12-LO (5 µg)

15-Lipoxygenase-1 (rabbit) Polyclonal Antiserum 160704

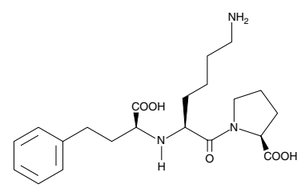
Lyophilized antiserum **Stability:** ≥3 years at -20°C
Summary: Antigen: rabbit reticulocyte 15-LO • Host: sheep • Cross Reactivity: (+) rabbit, human, and murine 15-LO-1 and 12-LO (porcine leukocyte) • Application(s): WB • 15-LO-1 catalyzes the formation of 15(S)-HETE and 13(S)-HODE from arachidonic acid and linoleic acid, respectively.

500 µl

Lisinopril 16833

[76547-98-3] MK 521, MK 522
MF: $C_{21}H_{31}N_3O_5$ **FW:** 405.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent ACE inhibitor that blocks the formation of angiotensin I with an IC_{50} value of 1.2 nM (ovine) and displays ID_{50} values of 2.3 and 6.5 µg/kg in rat and canine, respectively

100 mg
500 mg
1 g
5 g



Thomas G. Brock, Ph.D.

Think of Cayman as Epigenetics Central

In 1998, Vincent Felitti and colleagues asked over 13,000 adults to complete a questionnaire addressing their personal adverse childhood experiences (ACE), experiences that included psychological, physical, or sexual abuses as well as indicators of family dysfunction.[1] The questionnaire responses were then compared to measures of each individual's adult risk behavior, health status, and disease. Remarkably, this first "ACE" study found a "strong graded relationship between the breadth of exposure to abuse or household dysfunction during childhood and multiple risk factors for several of the leading causes of death in adults." That is, the greater the ACE score, the more likely the individual would, as an adult, smoke or use illicit drugs, suffer from alcoholism or depression, or attempt suicide. Moreover, increasing ACE scores correlated with increased prevalence and risk for ischemic heart disease, cancer, stroke, and diabetes. This landmark study has since been corroborated by both retrospective and prospective studies that link adverse psychosocial experiences during childhood with an increased risk for age-related diseases much later in life.[2,3]

In 1999, researchers looking for genes that were linked to cancer began to discover gene products that acted as methyltransferases or demethylases, acetyltransferases or deacetylases. In the intervening years, an explosion of research has developed our understanding of epigenetics, the persistent modification of nucleosomes or genetic material to alter gene expression without changing DNA sequence or copy number. For example, the methylation of histones, which commonly alters gene expression, can persist through mitosis and contribute to cell differentiation, organogenesis, and cancer (see related story, page 12).

Today, the epidemiological ACE studies converge with epigenetic models to suggest new explanations for psychosocial, as well as physiological, abnormalities in adults. For example, childhood experiences might produce critical epigenetic changes that persist into adulthood and contribute to depression. Experimentally, differences in maternal care of pups in rats alter DNA methylation and histone acetylation, affecting neural development.[4] Such experiments suggest new physiological mechanisms for certain diseases, like adult depression, which in turn offers hope for new therapeutic interventions. Cayman anticipates a growing interest in epigenetic research and the search for new compounds that modulate epigenetic pathways. As a result, we offer multiple avenues for epigenetic discovery.

Histone Acetylation

The term 'epigenetics' refers, in its broadest sense, to persistent changes in gene expression, exclusive of changes in DNA sequence, DNA copy number, or changes due directly to transcription factors. Much contemporary excitement focuses on the nucleosome. An old model presented this structure as a spool of histones with a thread of DNA wrapped around it, serving a physical mechanism for organizing the extensive genetic material within the nucleus (Figure 1). Now, it is clear that the nucleosome is a sophisticated device for tying down or feeding out genetic material and regulating transcription. One way to understand this 'device' involves considering the positive and negative charges distributed along DNA and histone components. From this viewpoint, the DNA backbone is a string of negatively charged phosphate groups. Histones are rich in basic residues, particularly at the amino termini, which contain regularly-spaced lysine residues (see related article, page 12). These positive charges set up an electrostatic potential between the DNA and histones, defining a physical interaction that binds the thread to the spool. That is, unmodified lysines can clamp down on DNA, preventing its access to promoters. The positive charges can be neutralized by methylation or reduced by acetylation. In addition, serines, threonines, and tyrosines can be phosphorylated, adding negative charges to specific sites on the histones. In Figure 1, lysine residues are colored red, while serines known to be phosphorylated are black.

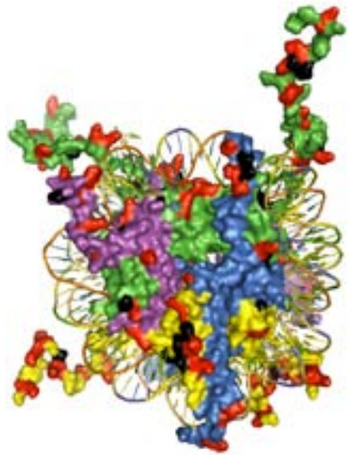


Figure 1. Nucleosomal structure, displaying the histones H2A (blue), H2B (yellow), H3 (green), and H4 (purple) in surface mode. Lysines known to be modified are colored red; serines known to be phosphorylated are black.

Interestingly, the modification of histones can range from crude, with multiple sites being altered en masse, to elegant and complex, with changes in individual sites controlled by sophisticated protein complexes under tight regulation.

A large number of acetyltransferases add an acetyl group (CH_3CO) to proteins, including histones. The acetylation of histones typically relaxes chromatin conformation, facilitates the recruitment of effector proteins, and increases transcription. These histone acetyltransferases (HAT) are also known as 'lysine (K) acetyltransferases' (KAT), since they can target proteins other than histones. Acetyl groups are removed by histone deacetylases (HDAC, a.k.a. KDAC). The human class I HDACs are homologous to the yeast enzyme Rpd3 and include HDAC1, 2, 3, and 8. Class II HDACs are homologous to yeast HDA1 and are divided into class IIa (HDAC4, 5, 7, 9) and class IIb (HDAC6, 10) based on structure. The human class III HDACs include the sirtuin (SIRT) family of NAD^+-dependent protein deacetylases. The novel HDAC11 has a distinct structure and is a class IV HDAC. The HDACs often participate in the formation of transcriptional complexes, inducing chromatin compaction through histone deacetylation and silencing gene expression.

HDACs, including SIRTs, have diverse roles in development and pathogenesis.[5-7] Most prominently, HDAC inhibitors affect inflammatory signaling. In humans, they inhibit NF-κB activation, while in mice and rats, they reduce the expression of tumor necrosis factor-α (TNF-α), a potent activator of NF-κB. HDAC inhibitors also suppress pro-inflammatory cytokine expression and block T-cell infiltration. HDACs are also necessary for normal cardiovascular development and endothelial functioning, with class I HDACs playing key roles in heart and cardiomyocyte development and HDAC7 contributing to endothelium integrity. SIRTs have principle roles in metabolic and inflammatory pathways, with SIRT1 and SIRT7 being important for cardiomyocyte survival.[8,9]

Cayman Chemical is a leader in the development of research tools for epigenetics research. The Cayman Protein Core produces pure, functional recombinant proteins and protein complexes. Many recombinant HDACs and SIRTs, as well as several histones, are currently available (Table 1). In addition, the Cayman Assay Development Team creates versatile and dependable assay kits. We also offer antibodies as well as a broad selection of pure and potent research chemicals.

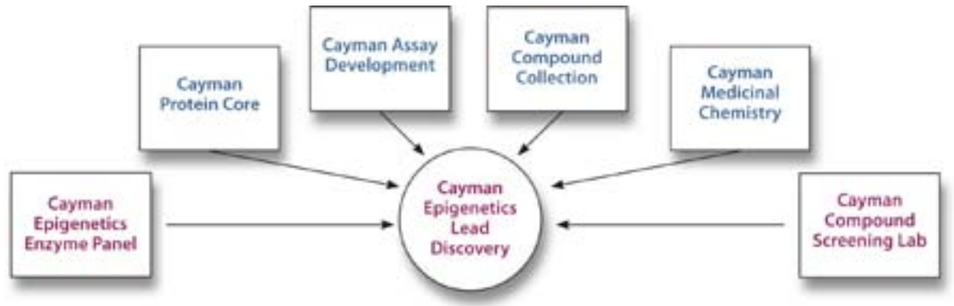


Figure 2. Cayman has historical strengths in recombinant protein production, assay development, compound synthesis, and medicinal chemistry. These are combined with a growing Epigenetics Enzyme Panel and a high-throughput Compound Screening Lab to drive Epigenetics Lead Discovery in our new facility.

Histone Methylation

Cardiovascular complications are the major cause of morbidity and mortality in the diabetic population. Exposure to high glucose is a major factor leading to these complications. Treatment is confounded by a well-documented phenomenon called "metabolic memory", which refers to the ability of certain organs to 'remember' their early glycemic environment and 'behave' accordingly.[10] For example, diabetic dogs switched from poor glucose control (no insulin treatment) to good control at two months, when examined at five years after the start of the study, suffered little retinopathy. Diabetic animals switched to good control at 2.5 years had a similar incidence of retinopathy as their control counterparts who received poor glucose control throughout the 5 year study. Many studies like this, both in the lab and the clinic, reflect the challenges of preventing cardiovascular complications through glucose control in diabetes.

Recent studies suggest that methyltransferases and demethylases contribute to inflammation during hyperglycemia that intertwines with subsequent vascular damage during diabetes.[11-13] In this model, acute hyperglycemia increases monomethylation of lysine 4 on histone 3 (H3K4) and suppresses methylation of H3K9 by altering the activities of the methyltransferases SET7/9 and SUV39H1, respectively. These changes lead to persistent activation of NF-κB through the enhanced recruitment of p65, upregulating pro-inflammatory pathways that drive cardiovascular complications. Most importantly, for these changes to lie at the heart of metabolic memory, they must be made at an early, impressionable stage and persist through multiple cell divisions over many years. It remains to be clarified how the methylation status of H3K4 and H3K9 can be faithfully preserved through mitosis and over time. Moreover, these changes must be consistently and specifically tied to NF-κB expression.

SET7/9 is also known as KMT7, for lysine methyltransferase 7. Similarly, LSD1 is also known as KDM1, for lysine demethylase 1. These newer names reflect a growing appreciation for the fact that both methyltransferases and demethylases target many proteins in addition to histones. For example, methylation of p53 by SET7/9 increases p53 activity. In fact, SET7/9 has numerous non-histone protein targets.[14] Is it possible that acute hyperglycemia at a formative age produces an epigenetic change on the expression of SET7/9 itself, perhaps through DNA methylation, and that metabolic memory involves SET7/9-dependent methylation of multiple proteins, including histones linked to NF-κB?

These and other questions involving methyltransferases and demethylases can be addressed using reagents available from Cayman. Cayman has created a full-service Epigenetics Lead Discovery facility that will identify small-molecule modulators of epigenetic target enzymes (Figure 2). This facility houses Cayman's new Compound Screening Lab, which will enable high-throughput screening of our in-house compound library (a 14,400 compound Maybridge HitFinder collection) or user-supplied collections against an individual target or a panel of epigenetic enzymes. To support these endeavors, additional recombinant proteins and assays are in development, with new products being added even as this article goes to press. Visit caymanchem.com to discover what's new today!

Histone acetylation/deacetylation proteins, kits, antibodies, and reagents

Category	Product (Item No.)
HDACs (human recombinant)	**HDAC1** (1009231), **HDAC2** (10009377), **HDAC3/NCOR2** (10009232), **HDAC4** (10009652), **HDAC5** (10009379), **HDAC6** (10009465), **HDAC8** (19380), **HDAC9** (10009466)
SIRTs (human recombinant)	**SIRT1** (10011190), **SIRT2** (10011191), **SIRT3** (10011194), **SIRT4** (10317), **SIRT5** (10318), **SIRT6** (10315), **SIRT7** (10316)
Histones and Acetyltransferases (recombinant)	**Histone H2B (Xenopus)** (10262), **Histone H3 (G103A substitution)** (10263), **Histone H4** (10264), **pCAF Histone Acetyltransferase** (10009115)
Assay Kits	**HAT Inhibitor Screening Assay Kit** (10006515), **HDAC Activity Assay Kit** (10011563), **HDAC Cell-Based Activity Assay Kit** (600150), **HDAC1 Inhibitor Screening Assay Kit** (10011564), **HDAC8 Inhibitor Screening Assay Kit** (700230), **SIRT1 Direct Fluorescence Screening Assay Kit** (10010401), **SIRT1 FRET-Based Screening Assay Kit** (10010991), **SIRT2 Direct Fluorescence Screening Assay Kit** (700280), **SIRT3 Direct Fluorescence Screening Assay Kit** (10011566), **SIRT6 Direct Fluorescence Screening Assay Kit** (700290)
Antibodies	**HDAC1** (13491), **HDAC3** (13493), **HDAC4** (13494), **HDAC6** (13499), **HDAC7 (Phospho-Ser^{155})** (13500), **HDAC11** (13504), **TIP60** (13789), **Acetyl Lysine (Clone 7F8)**(10010567), **SIRT7** (13477)
Key Reagents	**CAY 10398** (89740), **CAY 10591** (10009797), **CAY10603** (13146), **CBHA** (13172), **Chidamide** (13686), **coumarin-SAHA** (10671), **EX-527** (10009798), **(S)-HDAC-42** (13277), **HNHA** (13295), **M 344** (13174), **4-iodo-SAHA** (10495), **MS-275** (13284), ***trans*-Resveratrol** (70675), **SAHA** (10009929), **Salermide** (13178), **Scriptaid** (10572), **Sodium Butyrate** (13121), **SRT 1720** (10011020), **Tenovin-1** (13085), **Tenovin-6** (13086), **Trichostatin A** (89730), **Tubastatin A (trifluoroacetate salt)** (10559), **UNC0224** (13631), **UNC0321** (10582)

For a full product listing, please visit www.caymanchem.com

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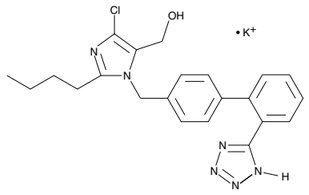
Losartan (potassium salt) 10006594

[124750-99-8] DuP 753, MK 954
MF: $C_{22}H_{23}ClN_6O$ • K **FW:** 461.0 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An AT_1 receptor antagonist (K_i = 5-20 nM); attenuates vein graft atherosclerosis in rabbits and reduces arterial blood pressure in rats; controls hypertension while protecting renal function in humans

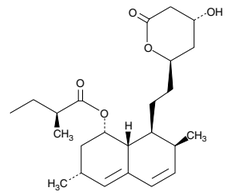
10 mg
50 mg
100 mg
500 mg



Lovastatin 10010338

[75330-75-5]
MF: $C_{24}H_{36}O_5$ **FW:** 404.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent, competitive inhibitor of HMG-CoA reductase (K_i = 0.6 nM)

5 mg
10 mg
25 mg
50 mg

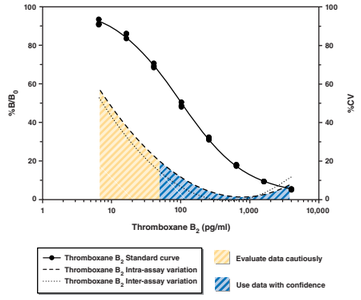


•Also Available: **Lovastatin Hydroxy Acid (sodium salt)** (10010339)

Luminex® Thromboxane B_2 Kit 10007502

Stability: ≥1 year at -20°C
Sensitivity: 80% B/B_0: ~24 pg/ml • 50% B/B_0: ~100 pg/ml
Summary: Cayman's Luminex™ TXB_2 can be used for quantification of TXB_2 in plasma, culture media, and other sample matrices.

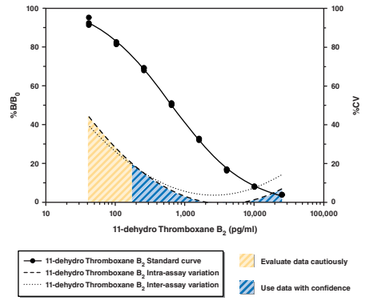
1 ea



Luminex® 11-dehydro Thromboxane B_2 Kit 10010971

Stability: ≥1 year at -20°C
Sensitivity: 50% B/B_0=650 pg/ml • 80% B/B_0=130 pg/ml
Summary: 11-dehydro TXB_2 is a metabolite of TXB_2 which can be measured in urine to reflect systemic production of TXB_2 *in vivo*. Cayman's Luminex™ 11-dehydro TXB_2 is the first of its kind for the measurement of 11-dehydro TXB_2 using Luminex™ xMAP™ technology.

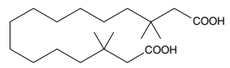
1 ea



MEDICA 16 90290

[87272-20-6]
MF: $C_{20}H_{38}O_4$ **FW:** 342.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A β,β'-dimethyl hexadecanedioic acid that exhibits hypolipidemic and antidiabetogenic effects

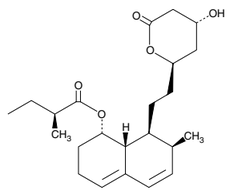
1 mg
5 mg
10 mg
50 mg



Mevastatin 10010340

[73573-88-3] Compactin, CS 500, L 637312, ML 236B, NSC 281245, Statin I
MF: $C_{23}H_{34}O_5$ **FW:** 390.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A reversible, competitive HMG-CoA reductase inhibitor (K_i = 1 nM)

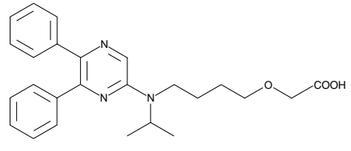
5 mg
10 mg
25 mg
50 mg



MRE-269 10010412

[475085-57-5]
MF: $C_{25}H_{29}N_3O_3$ **FW:** 419.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A stable analog of prostacyclin that potently and selectively activates the IP receptor (K_i = 20 nM); active form of the prodrug NS-304 that is stable *in vivo*, as plasma concentrations of MRE-269 remain near peak levels for more than eight hours; exhibits lower affinity for the vasoconstricting EP_3 receptor than other IP receptor agonists

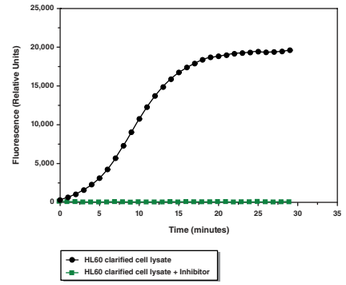
1 mg
5 mg
10 mg
50 mg



Myeloperoxidase Chlorination Assay Kit 10006438

Stability: ≥6 months at -20°C
Summary: Cayman's Myeloperoxidase Chlorination Assay provides a convenient fluorescence-based method for detecting the MPO chlorination activity in both crude cell lysates and purified enzyme preparations. The assay utilizes the non-fluorescent probe, APF, which is selectively cleaved by hypochlorite to yield the highly fluorescent compound fluorescein. The kit includes an MPO-specific inhibitor for distinguishing MPO activity from MPO-independent fluroescence.

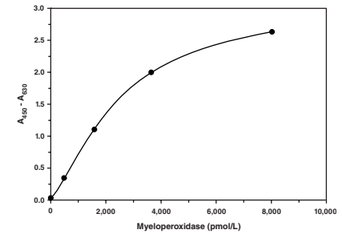
2 x 96 wells



Myeloperoxidase (human) EIA Kit 585001

Stability: ≥6 months at 4°C
Limit of Detection: 14 pg/ml
Summary: Cayman's MPO (human) EIA is an immunometric (*i.e.* sandwich) assay which can be used to measure MPO in plasma without prior sample purification. This assay has been tested using plasma from healthy volunteers and the results were shown to be consistent with published data.

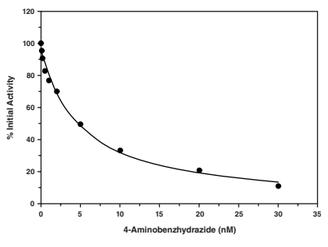
96 wells



Myeloperoxidase Inhibitor Screening Assay Kit 700170

Stability: ≥6 months at -20°C
Summary: Cayman's MPO Inhibitor Screening Assay provides fluorescence-based methods for screening inhibitors to both the chlorination and peroxidation activities of MPO. Sufficient reagents are provided for a full 96-well plate assay of each type of activity.

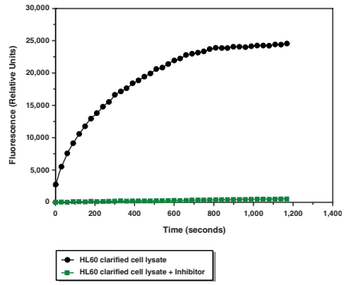
2 x 96 wells



Myeloperoxidase Peroxidation Assay Kit 700160

Stability: ≥6 months at -20°C
Summary: Cayman's MPO Peroxidation Assay provides a fluorescence-based method for detecting MPO peroxidase activity in both crude cell lysates and purified enzyme preparations. The MPO-catalyzed reaction between hydrogen peroxide and ADHP produces the highly fluorescent compound resorufin. The kit includes an MPO-specific inhibitor for distinguishing MPO activity from MPO-independent fluorescence.

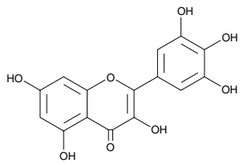
2 x 96 wells



Myricetin 10012600

[529-44-2] Cannabiscetin, NSC 407290
MF: $C_{15}H_{10}O_8$ **FW:** 318.2 **Purity:** ≥98%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A flavonoid compound that acts as a powerful antioxidant; inhibits TBARS formation with an IC_{50} value of 6.34 µM; blocks oxLDL uptake by U937-derived macrophages at 20 µM

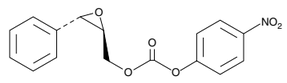
10 mg
25 mg
50 mg
100 mg



S-NEPC 10008609

MF: $C_{16}H_{13}NO_6$ **FW:** 315.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A colorimetric substrate for measurement of sEH activity

1 mg
5 mg
10 mg
25 mg



eNOS (bovine recombinant) 60880

ecNOS, NOS III
M_r: 135 kDa **Purity:** Cell lysate 100,000 x g supernatant
Supplied in: 50 mM HEPES, pH 7.4, containing 10% glycerol, 5 mM CHAPS, and 100 µM DTT
Source: Recombinant enzyme isolated from a Baculovirus overexpression system in *Sf*9 cells

10 units

eNOS Polyclonal Antiserum 160880

ecNOS, NOS III
Lyophilized antiserum **Stability:** ≥2 years at -20°C
Summary: Antigen: human eNOS amino acids 1186-1203 • Host: rabbit • Cross Reactivity: (+) bovine and human eNOS; (-) iNOS and nNOS • Application(s): IP and WB • eNOS catalyzes the formation of NO from L-arginine in many cells and tissues including vascular endothelium, bronchiolar epithelium, cardiac myocytes, spleen, and kidney.

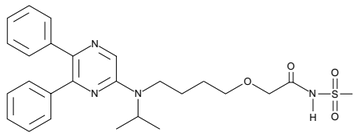
500 µl

•Also Available: **eNOS Blocking Peptide** (360881)
eNOS Electrophoresis Standard (360880)

NS-304 10010411

[475086-01-2] ACT-293987, Selexipag
MF: $C_{26}H_{32}N_4O_4S$ **FW:** 496.6 **Purity:** ≥98%
A solution in methyl acetate **Stability:** ≥1 year at -20°C
Summary: A long-acting and potent IP receptor agonist prodrug (K_i = 20 nM)

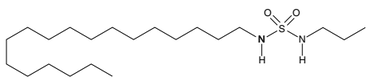
1 mg
5 mg
10 mg
50 mg



N-Octadecyl-N'-propyl-sulfamide 10009661

MF: $C_{21}H_{46}N_2O_2S$ **FW:** 390.7 **Purity:** ≥95%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A selective and potent activator of PPARα with an EC_{50} value of 100 nM; induces satiety, decreases food-intake, reduces body weight, and lowers plasma triglyceride concentration in free-feeding Wistar and obese Zucker (*fa/fa*) rats

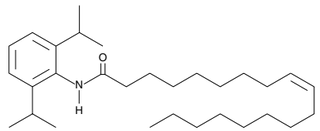
5 mg
10 mg
25 mg
50 mg



Oleic Acid-2,6-diisopropylanilide 10006782

[140112-65-8]
MF: $C_{30}H_{51}NO$ **FW:** 441.7 **Purity:** ≥98%
A solution in methyl acetate **Stability:** ≥1 year at -20°C
Summary: An inhibitor of ACAT with an IC_{50} value of 7 nM

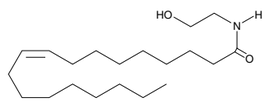
5 mg
10 mg
50 mg
100 mg



Oleoyl Ethanolamide 90265

[111-58-0] OEA, Oleic Acid Ethanolamide
MF: $C_{20}H_{39}NO_2$ **FW:** 325.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: An analog of AEA found in brain tissue and chocolate; accumulates rapidly in infarcted tissue; an endogenous, potent PPARα agonist (EC_{50} = 120 nM); suppresses food intake and reduces weight gain in rats

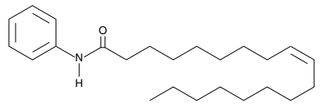
5 mg
10 mg
50 mg
100 mg



Oleyl Anilide 10006529

[5429-85-6] OA, Oleic Acid Anilide
MF: $C_{24}H_{39}NO$ **FW:** 357.6 **Purity:** ≥95%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A weak ACAT inhibitor with an IC_{50} value of 26 µM

5 mg
10 mg
50 mg
100 mg



Oxidized Lipid HPLC Mixture 34004

Purity: ≥98% for each compound
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: Contains the free acid forms of racemic 15-HETE, 9-HODE, and 13-HODE, as well as racemic 9-HODE and 13-HODE cholesteryl esters (5 µg each)

1 ea

oxLDL-β_2GPI (human) ELISA Kit 10007893

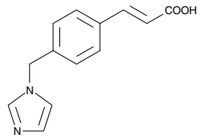
Oxidized low-density lipoprotein-β_2 Glycoprotein I (human)
Stability: ≥6 months at 4°C
Summary: oxLDL is the principal form of cholesterol that accumulates in atherosclerotic lesions or plaques. Unlike native LDL, oxLDL binds to β_2GPI to form oxLDL-β_2GPI complexes. Stable oxLDL-β_2GPI complexes are regarded as pathogenic and appear to be highly clinically relevant. Cayman's oxLDL-β_2GPI (human) ELISA is an immunometric (*i.e.*, sandwich) assay that detects the circulating oxLDL-β_2GPI complex in human serum or plasma.

1 ea

Ozagrel 70515

[82571-53-7] OKY-046
MF: $C_{13}H_{12}N_2O_2$ **FW:** 228.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A selective inhibitor of TX synthase (IC_{50} = 11 nM)

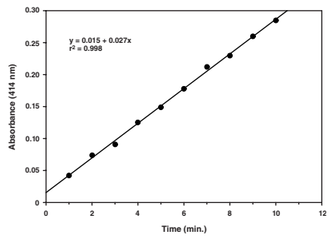
5 mg
10 mg
50 mg
100 mg



PAF Acetylhydrolase Assay Kit 760901

Lipoprotein PLA_2, Lp-PLA_2, PAF-AH
Stability: ≥1 year at -20°C
Summary: PAF-AH catalyzes the hydrolysis of the potent biologically-active phospholipid PAF, generating inactive lyso-PAF. Cayman's PAF-AH Assay provides an accurate and convenient method for measurement of PAF-AH activity. The assay uses 2-thio PAF which serves as a substrate for PAF-AH. Upon hydrolysis of the acetyl thioester bond at the *sn*-2 position by PAF-AH, free thiols are detected using DTNB (Ellman's reagent).

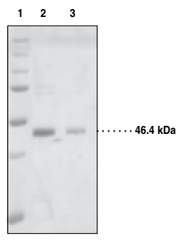
96 wells



PAF Acetylhydrolase (human recombinant) 10279

Lipoprotein PLA_2, Lp-PLA_2, PAF-AH
M_r: 46.4 kDa **Purity:** ≥95%
Supplied in: 100 mM sodium phosphate, pH 7.2, containing, 100 mM sodium chloride and 20% glycerol
Source: Recombinant N-terminal His-tagged protein purified from *E. coli*

25 µg
50 µg
100 µg

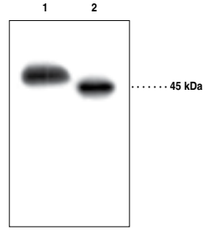


Lane 1: MW Standards
Lane 2: PAF-AH (2.5 µg)
Lane 3: PAF-AH (1.25 µg)

PAF Acetylhydrolase (human) Polyclonal Antibody 160603

Lipoprotein PLA_2, Lp-PLA_2, PAF-AH
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human PAF-AH C-terminal amino acids 420-441; the peptide sequence used as an antigen is 64% homologous to the corresponding bovine sequence • Host: rabbit • Cross Reactivity: (+) human plasma PAF-AH; (-) murine, guinea pig, canine, and chicken PAF-AH • Application(s): WB • PAF-AH converts PAF to the biologically inactive lyso-PAF. Plasma PAF-AH is highly selective for phospholipids with very short acyl groups at the *sn*-2 position and is associated with lipoproteins. It has been linked to atherosclerosis and may be a positive risk factor for coronary heart disease in humans.

500 µl



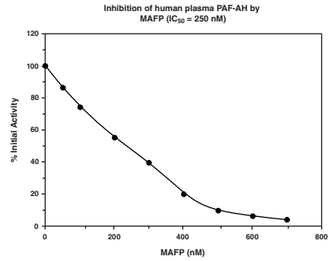
Lane 1: LDL fraction from human plasma
Lane 2: Recombinant human PAF-AH (20 µg)

•Also Available: **PAF Acetylhydrolase (human) Blocking Peptide** (360603)
PAF Acetylhydrolase (human) Western Ready Control (10010081)

PAF Acetylhydrolase Inhibitor Screening Assay Kit 10004380

Lp-PLA_2, PAF-AH
Stability: ≥6 months at -20°C
Summary: Cayman's PAF-AH Inhibitor Screening Assay uses 2-thio PAF as a substrate for PAF-AH. Upon hydrolysis of the acetyl thioester bond at the *sn*-2 position by PAF-AH, free thiols are detected using DTNB (Ellman's reagent).

96 wells



Platelet-Activating Factors

Item No.	Product Name	Sizes
60924	Azelaoyl PAF	500 µg • 1 mg • 5 mg • 10 mg
60900	PAF C-16	5 mg • 10 mg • 50 mg • 100 mg
360900	PAF C-16-d_4	100 µg • 500 µg • 1 mg • 5 mg
60906	Lyso-PAF C-16	5 mg • 10 mg • 50 mg • 100 mg
360906	Lyso-PAF C-16-d_4	100 µg • 500 µg • 1 mg • 5 mg
60925	2-O-ethyl PAF C-16	5 mg • 10 mg • 50 mg • 100 mg
60902	2-O-methyl PAF C-16	5 mg • 10 mg • 50 mg • 100 mg
60910	PAF C-18	5 mg • 10 mg • 50 mg • 100 mg
10010229	PAF C-18-d_4	100 µg • 500 µg • 1 mg • 5 mg
60916	Lyso-PAF C-18	5 mg • 10 mg • 50 mg • 100 mg
10010228	Lyso-PAF C-18-d_4	100 µg • 500 µg • 1 mg • 5 mg
60912	2-O-methyl PAF C-18	5 mg • 10 mg • 50 mg • 100 mg

For a full product listing, please visit www.caymanchem.com

PAF Receptor (human) Monoclonal Antibody (11A4, Clone 21) 160600

Protein-A purified IgG_{2a} **Stability:** ≥18 months at 4°C
Summary: Antigen: human PAF receptor amino acids 260-269 • Host: mouse, 11A4 clone 21 • Cross Reactivity: (+) human, bovine, and porcine PAF receptor • Application(s): FC, ICC; does not work for WB • PAF is a biologically active phospholipid whose biological effects include activation of platelets, polymorphonuclear leukocytes, monocytes, and macrophages. PAF increases vascular permeability, decreases cardiac output, induces hypotension, and stimulates uterine contraction.

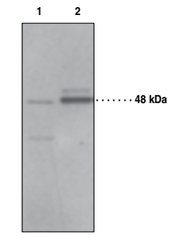
1 ea

•Also Available: **PAF Receptor Blocking Peptide (Monoclonal)** (360600)

PAF Receptor (human) Polyclonal Antibody 160602

Peptide affinity-purified IgG **Stability:** ≥1 year at 4°C
Summary: Antigen: human PAF receptor amino acids 1-17 • Host: rabbit • Cross Reactivity: (+) human, murine, rat, and porcine PAF receptor • Application(s): FC, ICC, and WB • PAF is a biologically active phospholipid whose biological effects include activation of platelets, polymorphonuclear leukocytes, monocytes, and macrophages. PAF increases vascular permeability, decreases cardiac output, induces hypotension, and stimulates uterine contraction.

500 µl



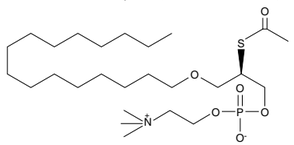
Lane 1: U937 cell lysate
Lane 2: Raji cell lysate

•Also Available: **PAF Receptor Blocking Peptide (Polyclonal)** (160604)

2-thio-PAF 60945

[96801-55-7]
MF: $C_{26}H_{54}NO_6PS$ **FW:** 539.8 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -80°C
Summary: A PAF receptor agonist with potency comparable to PAF C-18 and PAF C-16; chromogenic substrate used in Cayman's PAF-AH Assay Kit (Item No. 760901)

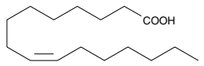
5 mg
10 mg
25 mg
50 mg



Palmitoleic Acid 10009871

[373-49-9] 9-cis-Hexadecenoic Acid, Palmitoleate, n-7 Palmitoleate, cis-Palmitoleic Acid
MF: $C_{16}H_{30}O_2$ **FW:** 254.4 **Purity:** ≥99%
A neat oil **Stability:** ≥1 year at -20°C
Summary: An ω-7 monounsaturated fatty acid that is a common constituent of the triglycerides of human adipose tissue; raises LDL cholesterol and lowers HDL cholesterol much like that of a saturated fatty acid, even when dietary intake of cholesterol is maintained at a low level

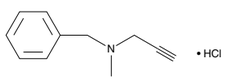
100 mg
500 mg
1 g
5 g



Pargyline (hydrochloride) 10007852

[306-07-0]
MF: $C_{11}H_{13}N$ • HCl **FW:** 195.7 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An irreversible inhibitor of monoamine oxidase (MAO) that is used clinically to treat moderate hypertension

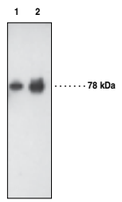
100 mg
500 mg
1 g
5 g



PCSK9 Monoclonal Antibody (Clone 15A6) 10218

NARC-1, Proprotein Convertase Subtilisin Kexin 9
Lyophilized IgG_1 **Stability:** ≥1 year at -20°C
Summary: Antigen: purified human recombinant PCSK9 • Host: mouse, clone 15A6 • Isotype: IgG_1 • Cross Reactivity: (+) human recombinant PCSK9 • Application(s): PCSK9 ligand blotting (nondenaturing conditions) and WB • PCSK9 is a member of the subtilisin serine protease family with an important role in lipoprotein metabolism. Gain-of-function mutations in the PCSK9 gene are associated with autosomal dominant hypercholesterolemia which is characterized by an increase in LDL cholesterol levels.

1 ea

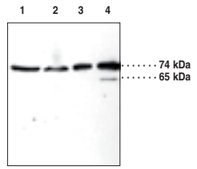


Lane 1: PCSK9 Western Ready Control (1 µg)
Lane 2: PCSK9 Western Ready Control (2 µg)

PCSK9 Polyclonal Antibody 10240

NARC-1, Proprotein Convertase Subtilisin Kexin 9
Protein A-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human recombinant PCSK9 • Host: rabbit · Cross Reactivity: (+) human, rat, and murine PCSK9 • Application(s): ICC and WB • PCSK9 is a member of the subtilisin serine protease family with an important role in lipoprotein metabolism. Gain-of-function mutations in the PCSK9 gene are associated with autosomal dominant hypercholesterolemia which is characterized by an increase in LDL cholesterol levels.

500 µl



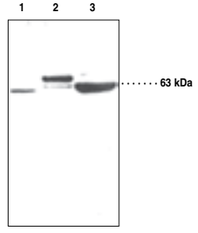
Lane 1: Murine heart (10,000 x g supernatant) (40 µg)
Lane 2: Murine liver (10,000 x g supernatant) (50 µg)
Lane 3: PCSK9 Western Ready Control (2 µl)
Lane 4: PCSK9 Western Ready Control (5 µl)

• Also Available: **PCSK9 Western Ready Control** (10009567)

PCSK9 (human) Polyclonal Antibody 10007185

NARC-1, Proprotein Convertase Subtilisin Kexin 9
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: synthetic peptide from human PCSK9 amino acids 490-502 • Host: rabbit • Cross Reactivity: (+) human, murine, and rat PCSK9 • Application(s): ICC and WB • PCSK9 is a member of the subtilisin serine protease family with an important role in lipoprotein metabolism. Several gain-of-function mutations in the PCSK9 gene are associated with hypercholesterolemia which is characterized by an increase in LDL cholesterol levels.

500 µl



Lane 1: Human liver microsome (50 µg)
Lane 2: HT-29 cell lysate (50 µg)
Lane 3: Rat kidney 100,000 x g supernatant (50 µg)

• Also Available: **PCSK9 (human) Blocking Peptide** (10007186)

PCSK9 (murine) Polyclonal Antibody 10008811

NARC-1, Proprotein Convertase Subtilisin Kexin 9
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: synthetic peptide from mouse PCSK9 amino acids 152-163 • Host: rabbit • Cross Reactivity: (+) human, murine, and rat PCSK9 • Applications: ICC and WB • PCSK9 is a member of the subtilisin serine protease family with an important role in lipoprotein metabolism. Several gain of function mutations in the PCSK9 gene are associated with hypercholesterolemia which is characterized by an increase in LDL cholesterol levels.

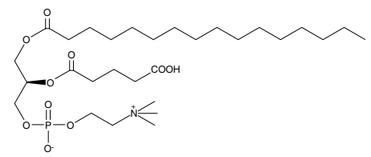
500 µl

• Also Available: **PCSK9 (murine) Blocking Peptide** (10009581)

PGPC 10044

[89947-79-5]
MF: $C_{29}H_{56}NO_{10}P$ **FW:** 609.7 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A predominant low molecular weight species of oxidized LDL; induces the expression of both E-selectin and VCAM-1, and increases endothelial cell binding by both neutrophils and monocytes

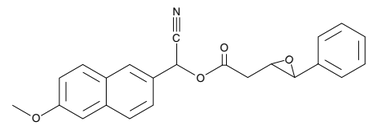
500 µg
1 mg
5 mg
10 mg



PHOME 10009134

NOTE: This substrate should only be used with the pure EH
MF: $C_{23}H_{19}NO_4$ **FW:** 373.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A fluorogenic, sensitive substrate for human sEH which displays good aqueous stability and solubility making it ideal for high throughput screening programs

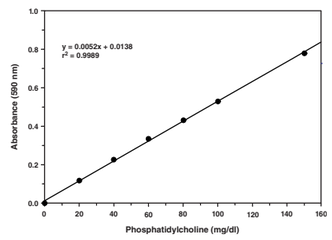
1 mg
5 mg
10 mg
50 mg



Phosphatidylcholine Assay Kit 10009926

PC
Stability: ≥6 months at -20°C
Summary: Cayman's PC Assay provides a specific, sensitive, and convenient method for quantifying PC in plasma or serum. In this assay, PC-specific PLD hydrolyzes PC to choline and phosphatidic acid. A coupled enzymatic reaction system generates a blue dye with maximum absorption at 595 nm.

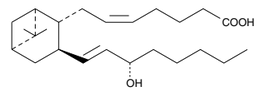
96 wells



Pinane Thromboxane A_2 19020

[71111-01-8] PTA$_2$
MF: $C_{24}H_{40}O_3$ **FW:** 376.6 **Purity:** ≥98%*
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: A stable analog of TXA_2 that acts as a TP receptor antagonist and inhibitor of TX synthase

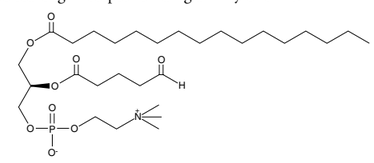
500 µg
1 mg
5 mg
10 mg



POV-PC 10031

[121324-31-0] 2-(5-oxovaleryl) Phosphatidylcholine
MF: $C_{29}H_{56}NO_9P$ **FW:** 593.7 **Purity:** ≥98%
A solution in ethanol **Stability:** ≥1 year at -20°C
Summary: One of the oxLDL species derived from 2-arachidonoyl or eicosapentanoyl phospholipids; confers CD36 scavenger receptor binding affinity of oxLDL

1 mg
5 mg
10 mg
25 mg



PPARα LBD (human recombinant) 10009088

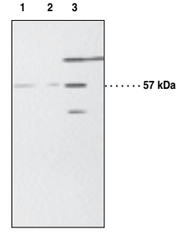
PPARα Ligand Binding Domain
M$_r$: ~34 kDa **Purity:** ≥90%
Supplied in: 50 mM sodium phosphate, pH 7.2, containing 20% glycerol, 100 mM sodium chloride, and 1 mM DTT
Source: Recombinant His-tagged protein purified from *E. coli*

25 µg
50 µg
100 µg

PPARα Polyclonal Antibody 101710

Peroxisome Proliferator-activated Receptor α
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human, mouse, and rat amino acids 22-36 • Host: rabbit • Cross Reactivity: (+) human, murine, rat, ovine, and porcine PPARα; (-) PPARγ • Application(s): WB • PPARα is a ligand-activated transcription factor involved in the regulation of lipid homeostasis.

500 µl



Lane 1: Baboon myometrium (100 µg)
Lane 2: Baboon myometrium (50 µg)
Lane 3: K-562 cell lysate (75 µg)

• Also Available: **PGC-1 Blocking Peptide** (301707)
PGC-1 Polyclonal Antibody (101707)
PPARα Blocking Peptide (301710)

PPARδ LBD (human recombinant) 10007451

FAAR, NUC1, Nuclear Hormone Receptor 1, PPARβ
M$_r$: 54 kDa **Purity:** ≥95%
Supplied in: 50 mM sodium phosphate, pH 7.2, containing 20% glycerol, 150 mM sodium chloride, and 1 mN DTT
Source: Recombinant protein isolated from Baculovirus overexpression system in Sf21 cells

10 µg
25 µg
50 µg

**All 5-cis 2-series PGs (those containing a 5,6-double bond) will contain a small amount of the 5-trans isomer. This isomer is generally undetectable using normal phase silica columns and plates, but may be resolved using RP-HPLC. The purity for all such 2-series PGs excludes the 1-3% trans isomer which will generally be present.*

PPAR Ligands					
Item No.	Product Name	Target	Mode of Action	Effective Concentration	Sizes
13452	AM3102	PPARα	Agonist	EC_{50} = 100 nM	5 mg • 10 mg • 25 mg • 50 mg
60924	Azelaoyl PAF	PPARγ	Agonist	~ Equal to Rosiglitazone	500 µg • 1 mg • 5 mg • 10 mg
10009145	Bezafibrate	pan PPAR	Agonist	EC_{50} = 20-60 µM	500 mg • 1 g • 5 g • 10 g
10009017	CAY10514	PPARα PPARγ	Dual Agonist	EC_{50} = 0.173 µM (PPARα) EC_{50} = 0.642 µM (PPARγ)	1 mg • 5 mg • 10 mg • 50 mg
10008846	CAY10573	pan-PPAR	Agonist	IC_{50} = 50-225 µM	500 µg • 1 mg • 5 mg • 10 mg
10012536	CAY10592	PPARδ	Agonist	EC_{50} = 53 nM (rat)	1 mg • 5 mg • 10 mg • 50 mg
13282	CAY10599	PPARδ	Agonist	EC_{50} = 50 nM	1 mg • 5 mg • 10 mg • 25 mg
71730	Ciglitazone	PPARγ	Agonist	EC_{50} = 3 µM	1 mg • 5 mg • 10 mg • 50 mg
10005745	Clofibrate	PPARα	Agonist	EC_{50} = 55 µM (human)	500 µl • 1 ml • 5 ml • 10 ml
10005368	Fenofibrate	PPARα	Agonist	EC_{50} = 30 µM (human)	1 g • 5 g • 10 g • 50 g
10006798	GW 0742	PPARδ	Agonist	EC_{50} = 1.1 nM	5 mg • 10 mg • 25 mg • 50 mg
10008613	GW 7647	PPARα	Agonist	EC_{50} = 6 nM (human)	1 mg • 5 mg • 10 mg • 25 mg
10011211	GW 9578	PPARα	Agonist	EC_{50} = 50 nM (human)	500 µg • 1 mg • 5 mg • 10 mg
70785	GW 9662	PPARγ	Antagonist	Blocks differentiation of monocytes to osteoclasts by >90% at a dose of 0.1 µM	1 mg • 5 mg • 10 mg • 50 mg
10009880	GW 590735	PPARα	Agonist	EC_{50} = 4 nM	1 mg • 5 mg • 10 mg • 25 mg
10009661	N-Octadecyl-N′-propyl-sulfamide	PPARα	Agonist	EC_{50} = 100 nM	5 mg • 10 mg • 25 mg • 50 mg
90265	Oleoyl Ethanolamide	PPARα	Agonist	EC_{50} = 120 nM	5 mg • 10 mg • 50 mg • 100 mg
18570	15-deoxy-$\Delta^{12,14}$-Prostaglandin J_2	PPARδ	Agonist	EC_{50} = 7 µM	100 µg • 500 µg • 1 mg • 5 mg
71740	Rosiglitazone	PPARγ	Agonist	K_d = 43 nM	5 mg • 10 mg • 50 mg • 100 mg
10026	T0070907	PPARγ	Antagonist	IC_{50} = 1 nM for inhibition of Rosiglitazone binding	1 mg • 5 mg • 10 mg • 50 mg
71750	Troglitazone	PPARγ	Agonist	EC_{50} = 0.55 µM (human)	5 mg • 10 mg • 50 mg • 100 mg
70730	Wy 14643	PPARα PPARδ	Agonist	Species dependent (PPARα: 0.1 - 10 µM)	5 mg • 10 mg • 50 mg • 250 mg

For a full product listing, please visit www.caymanchem.com

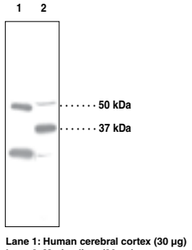
PPARδ Polyclonal Antibody 101720

FAAR, NUC1, Nuclear Hormone Receptor 1, PPARβ

Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C

Summary: Antigen: human PPARδ amino acids 39-54 • Host: rabbit • Cross Reactivity: (+) human, murine, rat, ovine, and porcine PPARδ • Application(s): ICC, IHC, and WB • PPARδ is ubiquitously expressed but is particularly abundant in tissues such as liver, intestine, kidney, abdominal adipose, and skeletal muscle, all of which are involved in lipid metabolism. PPARδ is a mediator of diverse physiological functions including lipid and cholesterol homeostasis, embryo implantation, cancer development, and obesity.

500 µl



Lane 1: Human cerebral cortex (30 µg)
Lane 2: Murine liver (30 µg)

•Also Available: **PGC-1 Blocking Peptide** (301707)
PGC-1 Polyclonal Antibody (101707)
PPARδ Blocking Peptide (10006247)
PPARδ Western Ready Control (10009568)

PPARγ FL (human recombinant from *E. coli*) 61700

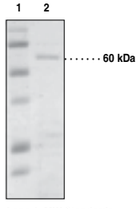
PPARγ Full Length

M_r: ~60 kDa **Purity:** ≥90% by SDS-PAGE

Supplied in: 20 mM Tris HCl, pH 8.0, containing 250 mM potassium, 20% glycerol, 5 mM DTT, and 0.5 mM EDTA

Source: Human recombinant N-terminal His-tagged protein expressed in *E. coli*

5 µg
10 µg
25 µg
50 µg



Lane 1: MW Standards
Lane 2: PPARγ FL (2 µg)

PPARγ FL (human recombinant from *Sf*21 cells) 10009987

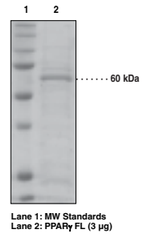
PPARγ Full Length

M_r: ~60 kDa **Purity:** ≥80% by SDS-PAGE

Supplied in: 50 mM sodium phosphate, pH 7.2, containing 100 mM sodium chloride, 1 mM DTT, and 20% glycerol

Source: Human recombinant N-terminal His-tagged protein expressed in *Sf*21 insect cells

5 µg
10 µg
25 µg
50 µg



Lane 1: MW Standards
Lane 2: PPARγ FL (3 µg)

PPARγ LBD (human recombinant) 10007941

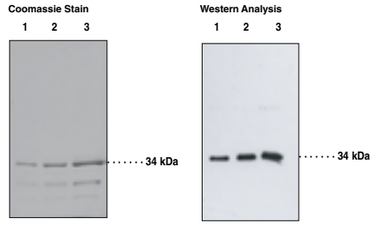
PPARγ Ligand Binding Domain

M_r: ~34 kDa **Purity:** ≥90%

Supplied in: 50 mM sodium phosphate, pH 7.2, containing 20% glycerol, 150 mM sodium chloride, and 1 mM DTT

Source: Recombinant N-terminal His-tagged protein expressed in *E. coli*

25 µg
50 µg
100 µg



Lane 1: PPARγ LBD (0.5 µg)
Lane 2: PPARγ LBD (1.0 µg)
Lane 3: PPARγ LBD (2.0 µg)

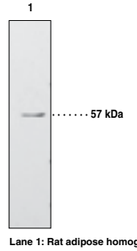
Lane 1: PPARγ LBD (0.5 µg)
Lane 2: PPARγ LBD (1.0 µg)
Lane 3: PPARγ LBD (2.0 µg)

PPARγ Polyclonal Antibody 101700

Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C

Summary: Antigen: human $PPAR\gamma_1$ amino acids 82-101 (amino acids 110-129 of $PPAR\gamma_2$) • Host: rabbit • Cross Reactivity: (+) human and murine $PPAR\gamma_1$ and $PPAR\gamma_2$ • Application(s): WB • PPARγ is a ligand-activated transcription factor involved in the regulation of lipid homeostasis and may function as a master regulator of adipogenesis.

500 µl



Lane 1: Rat adipose homogenate (30 µg)

•Also Available: **PGC-1 Blocking Peptide** (301707)
PGC-1 Polyclonal Antibody (101707)
PPARγ Blocking Peptide (301700)

PPAR Transcription Factor Assay Kits

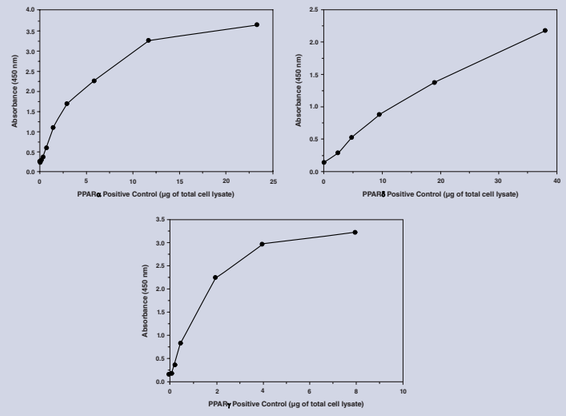
PPARs are ligand-activated transcription factors belonging to the large superfamily of nuclear receptors. PPARα primarily activates genes encoding proteins involved in fatty acid oxidation, while PPARγ primarily activates genes directly involved in lipogenic pathway and insulin signaling. Members of the PPAR family are important direct targets of many antidiabetic and hypolipidemic drugs. Cayman's PPAR Transcription Factor Assays are a non-radioactive, sensitive method for detecting specific transcription factor DNA binding activity in nuclear extracts and whole cell lysates. A 96-well ELISA replaces the cumbersome radioactive electrophoretic mobility shift assay (EMSA). A specific dsDNA sequence containing the PPAR response element is immobilized onto the bottom of wells of a 96-well plate. PPARs contained in a nuclear extract, bind specifically to the PPAR response element. PPARα, δ, or γ are detected by addition of specific primary antibodies directed against the individual PPARs. A secondary antibody conjugated to HRP is added to provide a sensitive colorimetric readout at 450 nm.

PPARα, δ, γ Complete Transcription Factor Assay Kit 10008878

Stability: ≥1 year at -20°C

Summary: This kit contains individual primary antibodies for PPARα, δ, or γ to follow detection of each receptor in separate wells of the plate.

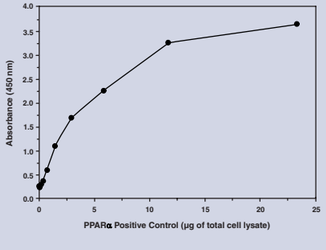
96 wells



PPARα Transcription Factor Assay Kit 10006915

Stability: ≥6 months at -20°C

96 wells



•Also Available: **PPARδ Transcription Factor Assay Kit** (10006914)
PPARγ FP-Based Ligand Screening Assay Kit - Green (10007685)
PPARγ Transcription Factor Assay Kit (10006855)

Olivia May, Ph.D.

eNOS, Vascular Endothelial Health, and CVD

The vascular endothelium is an active organ. Its integrity supports the beneficial effects of antioxidant, anti-inflammatory, anticoagulant, and pro-fibrinolytic actions. Under normal circumstances, it releases nitric oxide (NO), which inhibits the adhesion and migration of leukocytes, the migration and proliferation of smooth muscle cells, the aggregation and adhesion of platelets, and is essential for maintaining vascular tone. Reduced NO activity leads to endothelial dysfunction, a systemic event that precedes the development of atherosclerosis and other cardiovascular complications (hypertension, congestive heart failure, stroke, etc.). Numerous studies have shown that functional endothelial NO synthase (eNOS), which synthesizes NO in the endothelium, is protective against these pathological vascular complications.[1] The synthesis of NO is a remarkably dynamic process of redox reactions and allosteric modifications, whereby a dysfunctional endothelium can be restored with appropriate therapeutics. Thus, understanding the signaling pathways that confer vascular protection is of central importance to the refinement of therapeutic approaches to prevent or ameliorate cardiovascular diseases. What follows is a brief overview of eNOS signaling and protein modifications critical to proper endothelial function.

eNOS Activation and NO Signaling

In endothelial cells, functional eNOS transfers electrons from NADPH, *via* the flavins FAD and FMN in the carboxy-terminal reductase domain, to the heme in the amino-terminal oxygenase domain.(Figure 1) Here the substrate L-arginine is oxidized to L-citrulline and NO. eNOS is indirectly activated by physiological and metabolic stimuli, laminar shear stress, and receptor-dependent agonists (*i.e.*, VEGF, PAF, bradykinin). eNOS is bound to caveolin-1 through a consensus site in caveolae, which regulates the basal state of NO production. Its activation involves dissociation from caveolin-1, association with heat shock protein (Hsp)-90, Ca^{2+}- calmodulin binding, (calmodulin-dependent kinase II, Akt, PKA, or AMPK) phosphorylation of serine-1177, and dephosphorylation of threonine-495. At least six phosphorylation sites have been indentified for roles in eNOS activity. These include serine-116, -617, -635, and -1179 as well as threonine-497 and tyrosine-83. Calcium-calmodulin activation and phosphorylation increase NO production.

In endothelial cells eNOS is found mainly in the plasma membrane and the Golgi complex, but it also distributes in the cytosol. eNOS bound to the plasma membrane releases greater amounts of basal NO compared to that with intracellular localization, resulting in a greater ability to elicit cGMP signaling.[2] However, translocation of eNOS to subcellular compartments may be useful for precisely directing an efficacious signal to its intended target before encountering scavengers of reactive species. Movement from plasma membrane to subcellular locations (including the Golgi) is associated with de-myristoylation and de-palmitoylation, which encourage dissociation of eNOS with caveolin-1. Caveolae either pinch off (endocytosis) the plasma membrane, internalizing eNOS into the cell, or dissociate in some other manner.

Once NO is produced by the endothelium, it can regulate various aspects of the vascular system by targeting soluble guanylyl cyclase (sGC), which mediates cGMP-PKG signaling, or it can initate nitrosation reactions with iron-sulphur-centered proteins or proteins with reactive thiols (S-nitrosylation).(Figure 2) The PKG-dependent signaling pathway induces relaxation of vascular smooth muscle and suppression of platelet aggregation. Protein S-nitrosylation, a post-translational modification that has been compared to phosphorylation where NO modifies cysteine residues of target proteins, induces allosteric changes in protein function. It participates in the regulation of apoptosis, proliferation, protein secretion, ion channel activity, vesicular trafficking of local proteins, and NOS activity. Location of eNOS can influence these signaling events. eNOS activity in the Golgi results in the compartmentalization of NO and S-nitrosylation of select local proteins. However, Golgi-restricted eNOS has also been demonstrated to supply NO to adjacent smooth muscle cells, contributing to endothelium-dependent relaxation.[2] The factors are not yet clear as to what distinguishes signaling through cGMP-dependent *vs.* S-nitrosylation modifications.

M = myristoylation G2
P = palmitoylation C15, C26
N = S-nitrosylation C94, C99
G = S-glutathionylation C689, C908

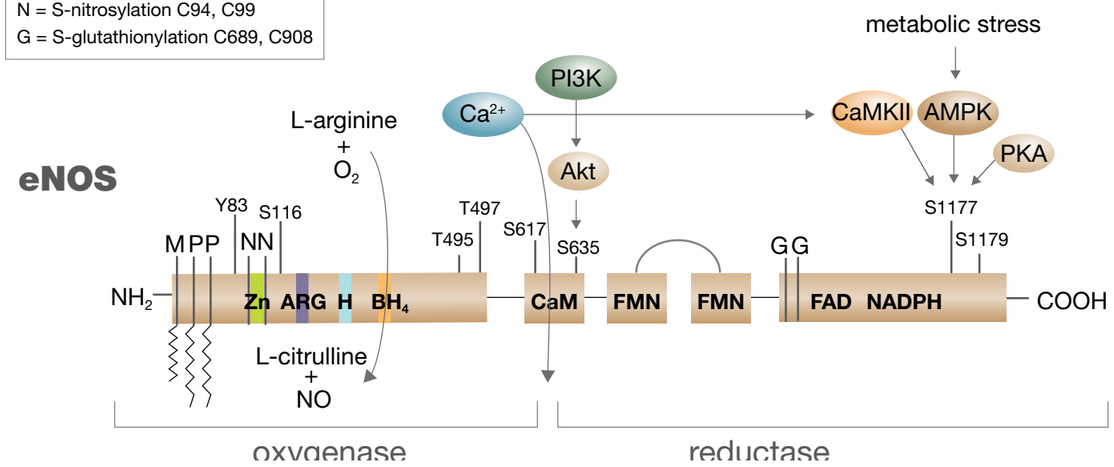


Figure 1. eNOS Protein Structure. Key phosphorylation sites are numbered and additional modifications are indicated by an M (myristoylation), P (palmitoylation), N (S-nitrosylation), or G (S-glutathionylation).

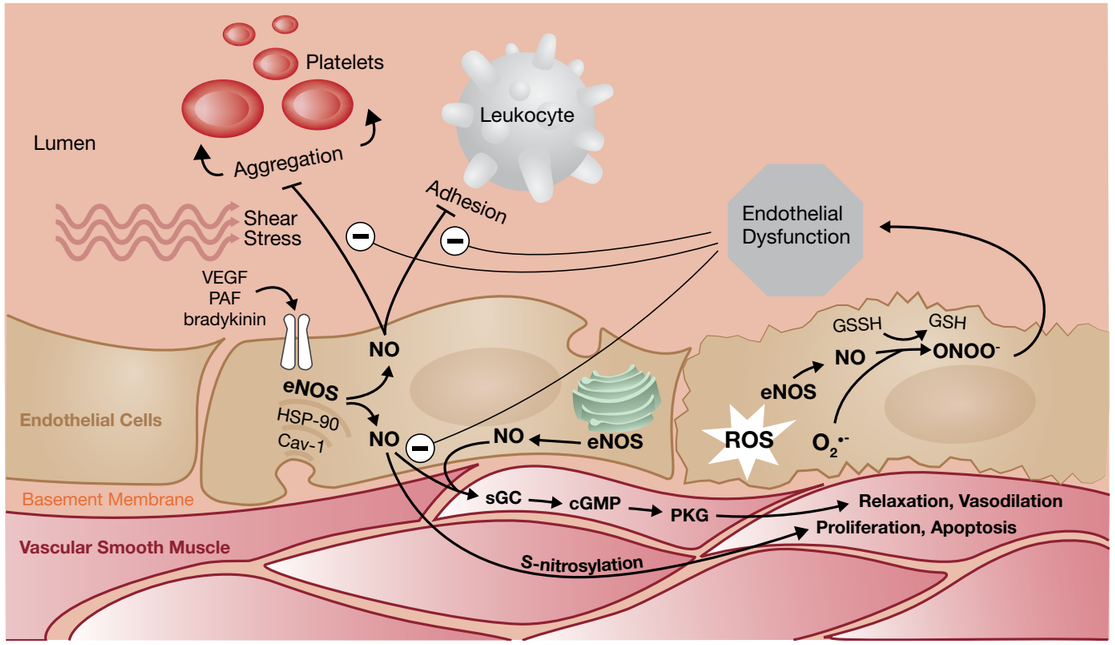


Figure 2. Schematic Representation of Endothelial Nitric Oxide Signaling. eNOS is activated by physiological and metabolic stimuli, shear stress, and receptor-dependent agonists to functionally inhibit platelet aggregation, leukocyte adhesion, and smooth muscle cell proliferation, as well as to maintain vascular tone. Oxidative stress uncouples eNOS-derived NO, increasing $ONOO^-$ production, which leads to endothelial dysfunction.

Uncoupling of eNOS Function

Cardiovascular risk factors induce oxidative stress, which alters various functions of the endothelium, including the reduced bioavailability of NO and the increased production of superoxide ($O_2^{\bullet -}$) and reactive oxygen species (ROS) in the vessel wall. These risk factors lead to an enhanced production of NADPH oxidases. NADPH-oxidase-derived superoxide readily reacts with eNOS-derived NO to form peroxynitrite ($ONOO^-$). The essential eNOS cofactor (6R-)5,6,7,8-tetrahydrobiopterin (BH_4) is highly sensitive to oxidation by $ONOO^-$. With BH_4 deficiency, reduction of O_2 becomes uncoupled from NO synthesis, thereby converting eNOS to a superoxide-producing enzyme.

Recently, the uncoupling of oxygen reduction by eNOS (*i.e.*, the switch from NO synthesis to superoxide production) has been proposed to result from S-glutathionylation of eNOS. This is a post-translational modification of key cysteine residues where glutathione is added through reversible thiol-disulfide exchange with oxidized glutathione (GSSH) or reaction of oxidant-induced protein thiyl radicals with reduced glutathione (GSH). S-glutathionylation of eNOS at cysteine-689 and cysteine-908 reversibly decreases NOS activity while at the same time increases superoxide generation.[3,4] S-glutathionylation of eNOS is increased with impaired endothelium-dependent vasodilation in hypertensive vessels.[3,4] Restoration of this function has been achieved in an *in vitro* model with thio-specific reducing agents that reverse S-glutathionylation of eNOS.[3,4]

Therapeutic Potential

Compounds interfering with the renin-angiotensin-aldosterone system as well as statins can reduce vascular oxidative stress and increase bioactive NO. Additionally, new small molecules are being identified that have the potential to prevent eNOS uncoupling and, at the same time, enhance eNOS expression. Compounds that increase eNOS protein levels are only advantageous if they support eNOS functionality otherwise superoxide production would be reinforced. The protein kinase C inhibitor PKC 412 (also known as midostaurin; Item No. 10459) maintains eNOS functionality in disease while at the same time upregulating the expression of the enzyme. It does so though a PKC-independent mechanism and reduces NADPH oxidase expression *via* PKC inhibition. By reducing NADPH oxidase-mediated oxidative stress, PKC 412 reverses eNOS uncoupling in spontaneously hypertensive rats and in atherosclerosis-prone apolipoprotein E knockout mice.[5,6] The polyphenolic phytoalexin *trans*-resveratrol (Item No. 70675) also reverses eNOS uncoupling and enhances eNOS expression. It has been shown to upregulate superoxide dismutases, glutathione peroxidase 1, and catalase in hypercholesterolemic apolipoprotein E knockout mice. Additionally it downregulates NADPH oxidases resulting in an overall reduction of peroxynitrite levels.[5,7,8] The continued development of compounds that combine eNOS upregulation with eNOS recoupling may thus have therapeutic potential for cardiovascular diseases and the restoration of proper endothelial function.

References

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5. Li, H., Hergert, S.M., Schäfer, S.C., *et al. Nitric Oxide* **12,** 231-236 (2005).
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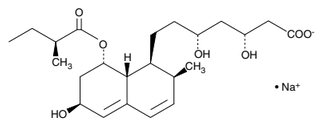
Pravastatin (sodium salt) 10010343

[81131-70-6]
MF: $C_{23}H_{35}O_7$ • Na **FW:** 446.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A potent, competitive inhibitor of HMG-CoA reductase (K_i = 2.3 nM)

5 mg
10 mg
25 mg
50 mg



Prorenin (human recombinant) 10007599

M_r: 45 kDa **Purity:** ≥99% by SDS-PAGE
Supplied in: 50 mM mM Tris, pH 8.0
Source: Recombinant enzyme expressed in HEK cells

25 µg
50 µg
100 µg
500 µg

2,3-dinor-6-keto Prostaglandin $F_{1\alpha}$ EIA Kit 515121

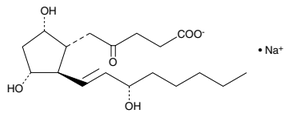
Stability: ≥1 year at -20°C
Sensitivity: 50% B/B_0: 400 pg/ml • 80% B/B_0: 100 pg/ml
Summary: PGI_2 is non-enzymatically hydrated to 6-keto $PGF_{1\alpha}$, and then quickly converted to the major urinary metabolite, 2,3-dinor-6-keto $PGF_{1\alpha}$. The majority of 6-keto $PGF_{1\alpha}$ in urine is of renal origin with only 14% originating from plasma. Cayman's 2,3-dinor-6-keto $PGF_{1\alpha}$ EIA utilizes a highly selective monoclonal antibody that exhibits no cross reactivity with 6-keto $PGF_{1\alpha}$, thus providing a method for accurate measurement of systemic PGI_2 production.

96 strip/solid wells
480 strip/solid wells

2,3-dinor-6-keto Prostaglandin $F_{1\alpha}$ (sodium salt) 15120

MF: $C_{18}H_{29}O_6$ • Na **FW:** 364.4 **Purity:** ≥98%
A solution in methanol **Stability:** ≥2 years at -20°C
Summary: β-oxidation product of 6-keto $PGF_{1\alpha}$ and the major urinary metabolite of PGI_2 in humans

100 µg
500 µg
1 mg
5 mg

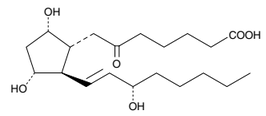


•Also Available: **2,3-dinor-6-keto Prostaglandin $F_{1\alpha}$-d_9 (sodium salt)** (9000462)

6-keto Prostaglandin $F_{1\alpha}$ 15210

[58962-34-8]
MF: $C_{20}H_{34}O_6$ **FW:** 370.5 **Purity:** ≥99%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: Inactive, non-enzymatic hydrolysis product of PGI_2; serves as a useful marker of PGI_2 biosynthesis *in vivo*

1 mg
5 mg
10 mg
50 mg

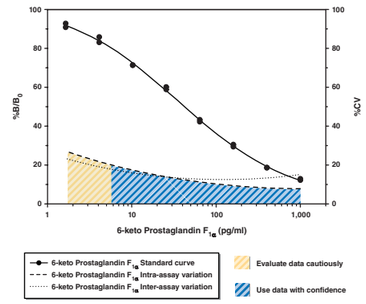


•Also Available: **6-keto Prostaglandin $F_{1\alpha}$-d_4** (315210)
6-keto Prostaglandin $F_{1\alpha}$ Lipid Maps MS Standard (10007219)
6-keto Prostaglandin $F_{1\alpha}$-d_4 Lipid Maps MS Standard (10007274)
6-keto Prostaglandin $F_{1\alpha}$ Quant-PAK (10006830)

6-keto Prostaglandin $F_{1\alpha}$ EIA Kit 515211

Stability: ≥1 year at -20°C
Sensitivity: 50% B/B_0: 40 pg/ml • 80% B/B_0: 6 pg/ml
Summary: Prostacyclin is formed from arachidonic acid primarily by the vascular endothelium and renal cortex. It is a potent vasodilator and inhibitor of platelet aggregation. PGI_2 is non-enzymatically hydrated to 6-keto $PGF_{1\alpha}$ ($t_{1/2}$ = 2-3 minutes), and then quickly converted to the major metabolite, 2,3-dinor-6-keto $PGF_{1\alpha}$ ($t_{1/2}$ = 30 minutes).

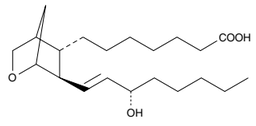
96 strip/solid wells
480 strip/solid wells



9,11-methane-epoxy Prostaglandin $F_{1\alpha}$ 10007850

[72517-81-8] 9,11-epoxymethano PGH_1
MF: $C_{21}H_{36}O_4$ **FW:** 352.5 **Purity:** ≥96%
A solution in methyl acetate **Stability:** ≥1 year at -20°C
Summary: A stable epoxymethano analog of PGH_1; produces a strong and dose-related aggregation of washed rabbit platelets (EC_{50} = 0.88 µM)

100 µg
500 µg
1 mg
5 mg



Prostaglandin I Synthase Monoclonal Antibody (Clone isn-1) 160630

PGIS, PGI Synthase, Prostacyclin Synthase
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: bovine lung PGIS • Host: mouse, clone isn-1 • Cross Reactivity: (+) bovine, murine, rat, ovine, guinea pig, and rabbit PGIS • Isotype: IgG_1 • Application(s): IHC and IP; WB not recommended • PGIS catalyzes the conversion of PGH_2 to PGI_2 (prostacyclin).

1 ea

Prostaglandin I Synthase Polyclonal Antibody 160640

PGIS, PGI Synthase, Prostacyclin Synthase
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: bovine PGIS amino acids 299-329 • Host: rabbit • Cross Reactivity: (+) bovine, ovine, and human PGIS; (-) rat PGIS • Application(s): IP and WB • PGIS catalyzes the isomerization of PGH_2 to PGI_2, a potent vasodilator and inhibitor platelet aggregation.

500 µl

•Also Available: **Prostaglandin I Synthase Blocking Peptide** (360640)

Prostaglandin I Synthase (murine) Polyclonal Antibody 100023

PGIS, PGI Synthase, Prostacyclin Synthase
Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: murine PGIS amino acids 475-490 conjugated to KLH • Host: rabbit • Cross Reactivity: (+) human, bovine, ovine, rat, and murine PGIS • Application(s): IHC and WB • PGIS catalyzes the isomerization of PGH_2 to PGI_2 (prostacyclin), a potent vasodilator and inhibitor of platelet aggregation.

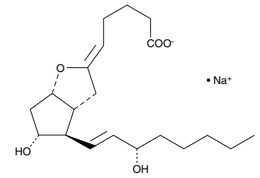
500 µl

•Also Available: **Prostaglandin I Synthase (murine) Blocking Peptide** (10005257)

Prostaglandin I_2 (sodium salt) 18220

[61849-14-7] Epoprostenol (sodium salt), Prostacyclin (sodium salt)
MF: $C_{20}H_{31}O_5$ • Na **FW:** 374.5 **Purity:** ≥99%*
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A primary metabolite of arachidonic acid formed by COX and PGIS; acts as a potent vasodilator and inhibitor of human platelet aggregation with an IC_{50} value of 5 nM

1 mg
5 mg
10 mg
25 mg

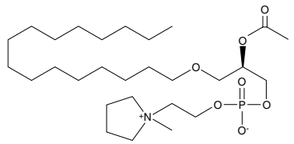


•Also Available: **Prostaglandin I_3 (sodium salt)** (18300)

Pyrrolidino PAF C-16 60909

[91021-63-5]
MF: $C_{28}H_{56}NO_7P$ **FW:** 549.7 **Purity:** ≥98%
A lyophilized powder **Stability:** ≥1 year at -20°C
Summary: A synthetic analog of PAF C-16 with approximately 3-10 times increased potency

1 mg
5 mg
10 mg
50 mg



Renin Fluorogenic Substrate 10006906

Purity: ≥95%
A red/brown crystalline solid **Stability:** ≥1 year at -20°C
Summary: The renin fluorogenic substrate consists of the normal peptide substrate for renin which has been linked to the fluorophore EDANS at one end and to a non-fluorescent quenching molecule (Dabcyl) at the other. After cleavage by renin, the product (peptide-EDANS) is brightly fluorescent and can be easily analyzed using an excitation wavelength of 340 nm and emission wavelengths of 485-510 nm.

1 mg

Renin (human recombinant) 10006217

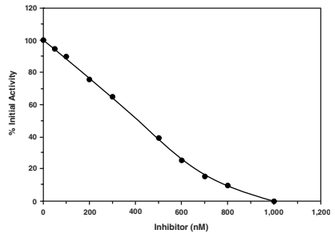
M_r: ~40 kDa **Purity:** ≥99% by SDS-PAGE
Supplied in: Sodium acetate buffer **Stability:** ≥6 months at -80°C
Source: Recombinant enzyme expressed in HEK cells as prorenin. The prorenin was activated using trypsin and purified using peptide affinity chromatography.

5 µg
10 µg
25 µg
50 µg

Renin Inhibitor Screening Assay Kit 10006270

Stability: ≥6 months at -80°C
Summary: Cayman's Renin Inhibitor Screening Assay provides a convenient 96-well format for evaluating human renin inhibitors. The assay utilizes a renin-based synthetic peptide substrate which incorporates the fluorophore EDANS at one end and an EDAN-quenching molecule (Dabcyl) at the other end. After cleavage by renin, the peptide-EDANS product is released yielding bright fluorescence.

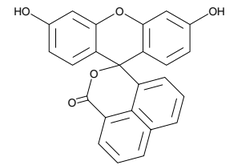
96 wells



Resorcinonaphthalein 13082

[41307-63-5] NSC 354317
MF: $C_{24}H_{14}O_5$ **FW:** 382.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: Increases the activity of angiotensin-converting enzyme 2 (ACE2) *in vitro* (EC_{50} = 19.5 µM)

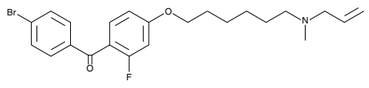
5 mg
10 mg
50 mg
100 mg



Ro 48-8071 10006415

[161582-11-2]
MF: $C_{23}H_{27}BrFNO_2$ **FW:** 448.4 **Purity:** ≥98%
A solution in methyl acetate **Stability:** ≥1 year at -20°C
Summary: An inhibitor of oxidosqualene cyclase (OSC) that has LDL cholesterol lowering activity; inhibits OSC from human liver microsomes and $HepG_2$ cells with IC_{50} values of approximately 6.5 and 1.5 nM, respectively

5 mg
10 mg
50 mg
100 mg



**All 5-cis 2-series PGs (those containing a 5,6-double bond) will contain a small amount of the 5-trans isomer. This isomer is generally undetectable using normal phase silica columns and plates, but may be resolved using RP-HPLC. The purity for all such 2-series PGs excludes the 1-3% trans isomer which will generally be present.*

Simvastatin 10010344

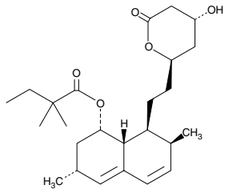
[79902-63-9] MK 733

MF: $C_{25}H_{38}O_5$ **FW:** 418.6 **Purity:** ≥98%

A crystalline solid **Stability:** ≥2 years at -20°C

Summary: A potent, competitive inhibitor of HMG-CoA reductase (K_i = 0.12 nM)

5 mg
10 mg
25 mg
50 mg



Epoxy Fatty Acids		
Item No.	**Product Name**	**Sizes**
Arachidonic Acid Derivatives		
50211	(±)5(6)-EET	25 µg • 50 µg • 100 µg • 500 µg
10009984	(±)5(6)-EET-d_{11}	10 µg • 25 µg • 50 µg • 100 µg
10008596	(±)5(6)-EET Ethanolamide	25 µg • 50 µg • 100 µg • 250 µg
50210	(±)5(6)-EET methyl ester	25 µg • 50 µg • 100 µg • 250 µg
50351	(±)8(9)-EET	25 µg • 50 µg • 100 µg • 500 µg
10009532	(±)8(9)-EET-d_{11}	10 µg • 25 µg • 50 µg • 100 µg
10008597	(±)8(9)-EET Ethanolamide	25 µg • 50 µg • 100 µg • 250 µg
50350	(±)8(9)-EET methyl ester	25 µg • 50 µg • 100 µg • 250 µg
50511	(±)11(12)-EET	25 µg • 50 µg • 100 µg • 500 µg
10006413	(±)11(12)-EET-d_{11}	10 µg • 25 µg • 50 µg • 100 µg
10008598	(±)11(12)-EET Ethanolamide	25 µg • 50 µg • 100 µg • 500 µg
50510	(±)11(12)-EET methyl ester	25 µg • 50 µg • 100 µg • 500 µg
50651	(±)14(15)-EET	25 µg • 50 µg • 100 µg • 500 µg
10006410	(±)14(15)-EET-d_{11}	25 µg • 50 µg • 100 µg • 250 µg
10008599	(±)14(15)-EET Ethanolamide	25 µg • 50 µg • 100 µg • 250 µg
50650	(±)14(15)-EET methyl ester	25 µg • 50 µg • 100 µg • 250 µg
10009286	(±)14(15)-EET-SI	25 µg • 50 µg • 100 µg • 250 µg
Docosahexanenoic Acid Derivatives		
90314	4(5)-EpDPE methyl ester	25 µg • 50 µg • 100 µg • 500 µg
10174	16(17)-EpDPE	25 µg • 50 µg • 100 µg • 500 µg
10175	19(20)-EpDPE	25 µg • 50 µg • 100 µg • 500 µg
Eicosapentaenoic Acid Derivatives		
90114	5(6)-EpETE methyl ester	25 µg • 50 µg • 100 µg • 500 µg
10173	14(15)-EpETE	25 µg • 50 µg • 100 µg • 500 µg
50861	17(18)-EpETE	25 µg • 50 µg • 100 µg • 500 µg
Linoleic Acid Derivatives		
52400	(±)9(10)-EpOME	25 µg • 50 µg • 100 µg • 250 µg
10009995	(±)9(10)-EpOME-d_4	25 µg • 50 µg • 100 µg • 250 µg
52450	(±)12(13)-EpOME	25 µg • 50 µg • 100 µg • 250 µg
10009996	(±)12(13)-EpOME-d_4	25 µg • 50 µg • 100 µg • 250 µg

Also Available: (±)5(6)-EET Lipid Maps MS Standard (10007260) • (±)8(9)-EET Lipid Maps MS Standard (10007261) • (±)11(12)-EET Lipid Maps MS Standard (10007262) • (±)14(15)-EET Lipid Maps MS Standard (10007263)

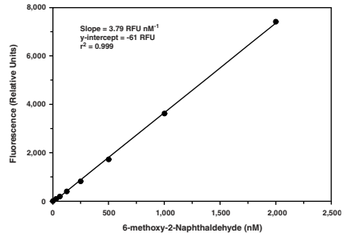
Soluble Epoxide Hydrolase Cell-Based Assay Kit 600090

CEH, Cytosolic Epoxide Hydrolase, EPHX2, Epoxide Hydrolase 2

Stability: ≥1 year at -80°C

Summary: Mammalian sEH is a member of the α/β-hydrolase fold family of enzymes that catalyze the hydrolysis of exogenous and endogenous epoxides to vicinal diols. Endogenous substrates for sEH include EETs which exhibit vasodilatory and anti-inflammatory activity. Cayman's sEH Cell-Based Assay provides a fluorescence-based method for detecting epoxide hydrolase activity in whole cells. The assay utilizes Epoxy Fluor 7, a sensitive fluorescent substrate for sEH that can be used to monitor the activity of both human and murine enzymes.

480 wells



Soluble Epoxide Hydrolase (human recombinant) 10011669

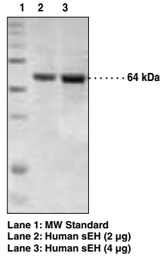
CEH, Cytosolic Epoxide Hydrolase, EPHX2, Epoxide Hydrolase 2

M_r: 67 kDa **Purity:** ≥95%

Supplied in: TBS buffer at pH 7.4 containing 20% glycerol

Source: Recombinant N-terminal His-tagged protein purified from *Sf*21 cells

25 µg
50 µg
100 µg



Lane 1: MW Standard
Lane 2: Human sEH (2 µg)
Lane 3: Human sEH (4 µg)

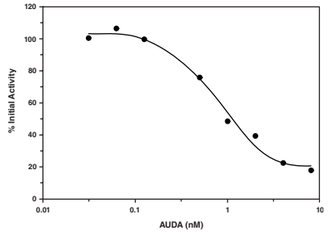
Soluble Epoxide Hydrolase Inhibitor Screening Assay Kit 10011671

CEH, Cytosolic Epoxide Hydrolase, EPHX2, Epoxide Hydrolase 2

Stability: ≥6 months at -80°C

Summary: sEH catalyzes the hydrolysis of exogenous and endogenous epoxides to vicinal diols. Endogenous substrates for sEH include epoxyeicosatrienoic acids (EETs) which exhibit vasodialatory and anti-inflammatory activity. Small molecule inhibitors of sEH may therefore hold promise as therapeutics for the treatment of hypertension and vascular inflammation. Cayman's fluorescence-based sEH Inhibitor Screening Assay provides a convenient method for screening epoxide hydrolase inhibitors. The assay utilizes (3-phenyl-oxiranyl)-acetic acid cyano-(6-methoxy-naphthalen-2-yl)-methyl ester (PHOME) as a substrate. Hydrolysis of PHOME by epoxide hydrolase produces the highly fluorescent 6-methoxy-2-naphthaldehyde which can be analyzed using an excitation wavelength of 330 nm and emission wavelength of 465 nm. Each kit contains buffer, substrate, and sufficient human recombinant sEH for 100 tests.

96 wells



Soluble Epoxide Hydrolase (murine recombinant from Sf21 cells) 10011670

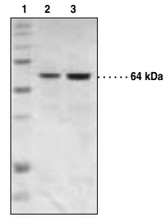
CEH, Cytosolic Epoxide Hydrolase, EPHX2, Epoxide Hydrolase 2

M_r: 64 kDa **Purity:** ≥95%

Supplied in: TBS buffer at pH 7.4 containing 20% glycerol

Source: Recombinant N-terminal His-tagged protein purified from *Sf*21 cells

25 µg
50 µg
100 µg



Lane 1: MW Standards
Lane 2: Murine sEH (2 µg)
Lane 3: Murine sEH (4 µg)

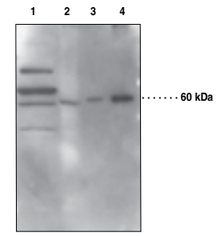
Soluble Epoxide Hydrolase Polyclonal Antibody 10010146

CEH, Cytosolic Epoxide Hydrolase, EPHX2, Epoxide Hydrolase 2

Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C

Summary: Antigen: rat sEH amino acids 292-306 • Host: rabbit • Cross Reactivity: (+) human, murine, and rat sEH • Application: WB • sEH converts epoxyeicosatrienoic acids (EpETrEs, EETs) to the corresponding dihydroxy eicosatrienoic acids (DiHETrEs, DHETs), which diminishes their vasodilator activity.

500 µl



Lane 1: Human fetal liver (50 µg)
Lane 2: Murine liver supernatant (50 µg)
Lane 3: EPHX2 fusion protein (1 ng)
Lane 4: EPHX fusion protein (5 ng)

•Also Available: **Soluble Epoxide Hydrolase Blocking Peptide** (10010147)

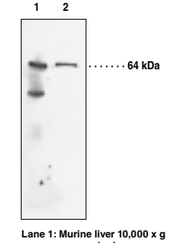
Soluble Epoxide Hydrolase (FL) Polyclonal Antibody 13560

CEH, Cytosolic Epoxide Hydrolase, EPHX2, Epoxide Hydrolase 2

Protein A-purified IgG **Stability:** ≥1 year at -20°C

Summary: Antigen: murine recombinant sEH • Host: rabbit • Cross Reactivity: (+) human and murine sEH • Application(s): WB • sEH converts epoxyeicosatrienoic acids (EpETrEs, EETs) to the corresponding dihydroxy eicosatrienoic acids (DiHETrEs, DHETs), which diminishes their vasodilator activity.

500 µl



Lane 1: Murine liver 10,000 x g supernatant
Lane 2: Purified murine sEH

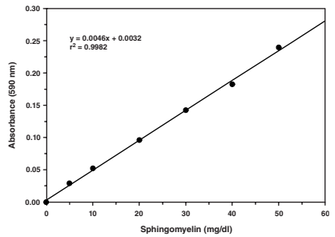
Dihydroxy Eicosatetraenoic Acids (DiHETEs)		
Item No.	**Product Name**	**Sizes**
Arachidonic Acid Derivatives		
35200	5(S),6(R)-DiHETE	25 µg • 50 µg • 100 µg • 250 µg
10009628	5(S),6(R)-11-*trans*-DiHETE	25 µg • 50 µg • 100 µg • 250 µg
35210	5(S),6(S)-DiHETE	25 µg • 50 µg • 100 µg • 250 µg
35280	5(S),15(S)-DiHETE	25 µg • 50 µg • 100 µg • 250 µg
35370	8(S),15(S)-DiHETE	25 µg • 50 µg • 100 µg • 250 µg
Eicosapentaenoic Acid Derivatives		
10006998	(±)14,15-DiHETE	25 µg • 50 µg • 100 µg • 250 µg
10006999	(±)17,18-DiHETE	25 µg • 50 µg • 100 µg • 250 µg

Also Available: 5(S),6(R)-DiHETE Lipid Maps MS Standard (10007252) • 5(S),6(S)-DiHETE Lipid Maps MS Standard (10007253) • 5(S),15(S)-DiHETE Lipid Maps MS Standard (10007255)

Sphingomyelin Assay Kit 10009928

SM
Stability: ≥6 months at 4°C
Summary: Sphingomyelin is an important lipid component of cell membranes and lipoproteins. Cayman's SM Assay provides a specific, sensitive, and convenient method for quantifying SM in plasma or serum in a 96-well format with a colorimetric readout at 595 nm.

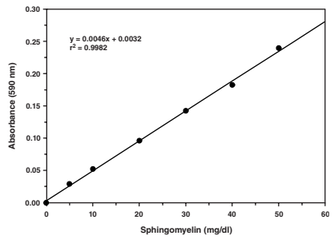
96 wells



Sphingomyelinase Assay Kit 10006964

SMase
Stability: ≥6 months at -20°C
Summary: Cayman's Sphingomyelinase Assay provides a simple, reproducible, and sensitive tool for measuring neutral and acidic sphingomyelinase activity from tissue homogenates, cell lysates, serum, saliva, and urine. The assay employs a coupled enzymatic reaction system, resulting in the formation of highly fluorescent resorufin (excitation: 530-540 nm; emission 585-595 nm).

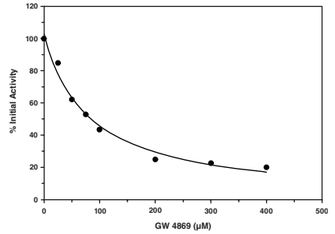
96 wells



Sphingomyelinase Inhibitor Screening Assay Kit 700330

SMase
Stability: ≥6 months at -20°C
Summary: Cayman's Sphingomyelinase Inhibitor Screening Assay is a novel method for screening sphingomyelinase inhibitors. Cleavage of a unique sphingomyelin conjugate by SMase in the assay results in the release of a ceramide analog containing a free thiol which is detected by the SMase Detector to yield a highly fluorescent product.

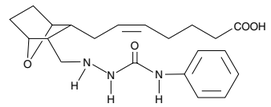
96 wells



SQ 29,548 19025

[98672-91-4]
MF: $C_{21}H_{29}N_3O_4$ **FW:** 387.5 **Purity:** ≥99%*
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A highly selective TP receptor antagonist (K_i = 4.1 nM)

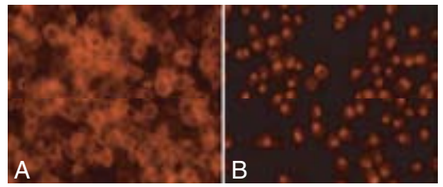
1 mg
5 mg
10 mg
100 mg



SREBP-2 Cell-Based Translocation Assay Kit 10009239

SREBF-2
Stability: ≥1 year at -20°C
Summary: Cayman's SREBP-2 Cell-Based Translocation Assay Kit provides the tools needed to study SREBP-2 movement within whole cells. The kit contains a highly specific SREBP-2 primary antibody together with a DyLight™ (trademarked by Pierce Biotechnology Inc.) conjugated secondary antibody in a ready to use format. Also included as a positive control is a cholesterol trafficking inhibitor, U18666A, which has been shown to activate SREBP-2 translocation into nuclei by scientists at Cayman Chemical Company.

96 wells

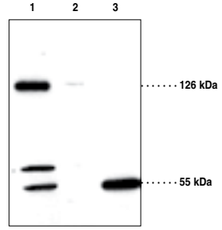


Translocation of SREBP-2 into nuclei by 24 µM U-18666A. Raw 264.7 cells were treated with DMSO (vehicle) or 24 µM U-18666A for 72 hours. *Panel A*: Cells treated with DMSO alone demonstrate cytoplasmic localization of SREBP-2, indicating that most of cells have inactive protein. *Panel B*: U-18666A treatment for three days induced SREBP-2 translocation into the nuclei, indicating that blockage of cholesterol transport in these cells activates the protein.

SREBP-2 Polyclonal Antibody 10007663

SREBF-2
Affinity-purified IgG **Stability:** ≥1 year at -20°C
Summary: Antigen: human SREBP-2 amino acids 455-469 • Host: rabbit • Cross Reactivity: (+) human, murine, and rat SREBP-2 • Application(s): ICC and WB • SREBP-2 is a transcription factor that plays a critical role in lipid homeostasis by regulating genes involved in cholesterol and fatty acid metabolism.

500 µl



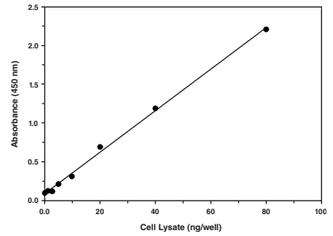
Lane 1: Human fibroblast cell lystate (60 µg)
Lane 2: Rat brown fat homogenate (60 µg)
Lane 3: Rat testis supernatant (60 µg)

• Also Available: **SREBP-2 Blocking Peptide** (10009266)
SREBP-2 Western Ready Control (10009749)

SREBP-2 Transcription Factor Assay Kit 10007819

SREBF-2
Stability: ≥6 months at -20°C
Summary: SREBP-2 is a transcription factor that performs a critical role in the transcriptional regulation of genes involved in cholesterol synthesis and uptake including HMG-CoA synthase, HMG-CoA reductase, and the LDL receptor. Cayman's SREBP-2 Transcription Factor Assay is a non-radioactive, sensitive method for detecting SREBP-2 DNA binding activity in nuclear extracts and whole cell lysates.

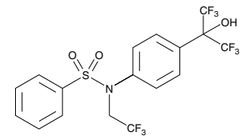
96 wells



T0901317 71810

[293754-55-9]
MF: $C_{17}H_{12}F_9NO_3S$ **FW:** 481.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥1 year at -20°C
Summary: A potent and selective agonist for both LXRα and LXRβ (EC_{50} = 50 nM)

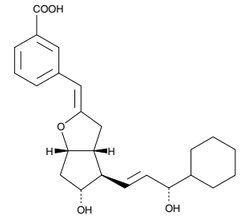
5 mg
10 mg
50 mg
100 mg



Taprostene (sodium salt) 10011348

[87440-45-7] CG 4203, Rheocyclan
MF: $C_{24}H_{29}O_5$ • Na **FW:** 420.5 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A stable prostacyclin analog and agonist of the IP receptor; does not activate EP_4

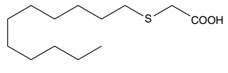
500 µg
1 mg
5 mg
10 mg



3-Thiatetradecanoic Acid 90500

[116296-31-2] 3-TDA
MF: $C_{13}H_{26}O_2S$ **FW:** 246.4 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An analog of myristic acid wherein the C-3 carbon has been replaced by sulfur in a thioether linkage; acts as a PPAR ligand, increases fatty acid oxidation, and lowers plasma lipid levels

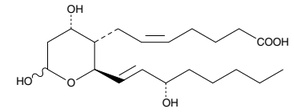
1 mg
5 mg
10 mg
50 mg



Thromboxane B_2 19030

[54397-85-2]
MF: $C_{20}H_{34}O_6$ **FW:** 370.5 **Purity:** ≥99%*
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: A stable, biologically inert metabolite formed from the rapid non-enzymatic hydrolysis of TXA_2

1 mg
5 mg
10 mg
50 mg

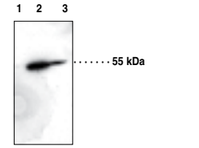


• Also Available: **Thromboxane B_2-d_4** (319030)
Thromboxane B_2 Lipid Maps MS Standard (10007237)
Thromboxane B_2 Quant-PAK (10006832)

Thromboxane B_2 11-dehydrogenase Polyclonal Antiserum 160720

Lyophilized antiserum **Stability:** ≥3 years at -20°C
Summary: Antigen: human erythrocyte TXB_2 11-dehydrogenase • Host: rabbit • Cross Reactivity: (+) human erythrocyte, porcine liver, and ovine liver TXB_2 11-dehydrogenase • Application(s): WB • TXB_2 11-dehydrogenase catalyzes the conversion of TXB_2 to 11-dehydro TXB_2

500 µl

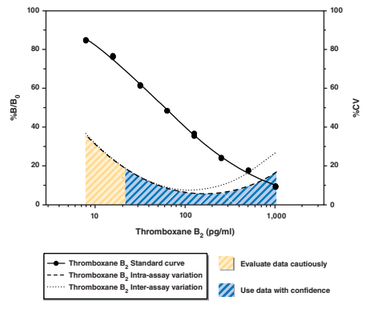


Lane 1: Murine liver homogenate 10,000 x g supernatant (30 µg)
Lane 2: Porcine liver homogenate 10,000 x g supernatant (30 µg)
Lane 3: Ovine liver homogenate 10,000 x g supernatant (30 µg)

Thromboxane B_2 EIA Kit 519031

Stability: ≥1 year at -20°C
Sensitivity: 50% B/B_0: 57 pg/ml • 80% B/B_0: 11 pg/ml
Summary: TXA_2 is produced from arachidonic acid by many cells and causes irreversible platelet aggregation and vascular and bronchial smooth muscle contraction. TXA_2 is rapidly hydrolyzed non-enzymatically to form TXB_2, which is then quickly metabolized ($t_{1/2}$ = 5-7 minutes) to urinary metabolites for clearance by the kidneys. Because of the transient nature of this compound it is difficult to accurately measure circulating levels in whole-animal experimental models. In fact, it has been shown that plasma and urine levels of TXB_2 are primarily due to *ex vivo* platelet activation and intra-renal production, respectively. Therefore, measurement of TXB_2 metabolites such as 11-dehydro TXB_2 (Item No. 519501) and 2,3-dinor TXB_2 (Item No. 519051) in urine and plasma may give better estimates of *in vivo* TXA_2 production. TXB_2 measurement is better suited towards samples that are not expected to undergo extensive metabolism such as perfusates, lavage samples, and tissue/cell culture medium or lysates.

96 strip/solid wells
480 strip/solid wells



• Also Available: **Thromboxane B_2 Express EIA Kit - Monoclonal** (10004023)

**All 5-cis 2-series PGs (those containing a 5,6-double bond) will contain a small amount of the 5-trans isomer. This isomer is generally undetectable using normal phase silica columns and plates, but may be resolved using RP-HPLC. The purity for all such 2-series PGs excludes the 1-3% trans isomer which will generally be present.*

11-dehydro Thromboxane B_2 19500

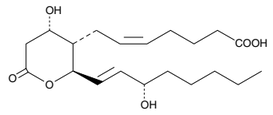
[67910-12-7] 11-keto TXB$_2$

MF: $C_{20}H_{32}O_6$ **FW:** 368.5 **Purity:** ≥98%*

A solution in methyl acetate **Stability:** ≥1 year at -20°C

Summary: One of the main plasma and urinary metabolites of TXB_2 that is used as a marker of TXA_2 synthesis *in vivo*

100 µg
250 µg
500 µg
1 mg



•Also Available: **11-dehydro Thromboxane B$_2$-d$_4$** (319500)
11-dehydro Thromboxane B$_2$ Lipid Maps MS Standard (10007239)
11-dehydro Thromboxane B$_2$ Quant-PAK (10006832)

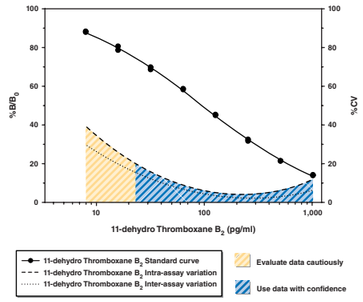
11-dehydro Thromboxane B_2 EIA Kit 519501

Stability: ≥1 year at -20°C

Sensitivity: 50% B/B_0: 93 pg/ml • 80% B/B_0: 16 pg/ml

Summary: TXA_2 is produced from arachidonic acid by many cells and causes irreversible platelet aggregation and vascular and bronchial smooth muscle contraction. TXA_2 is rapidly hydrolyzed non-enzymatically to form TXB_2. Although it is common to estimate TXA_2 levels by measuring TXB_2, most of the TXB_2 measured in plasma or urine is due to *ex vivo* platelet activation or intra-renal production, respectively. Measurement errors are compounded by the fact that normal concentrations of circulating TXB_2 are extremely low (1-2 pg/ml), and highly transient ($t_{1/2}$ = 5-7 minutes). To circumvent this problem, it is necessary to measure a metabolite that cannot be formed by platelets or by the kidney. TXB_2 can be metabolized by 11-hydroxy TX dehydrogenase to form 11-dehydro TXB_2, or by β-oxidation to form 2,3-dinor TXB_2. Infusion studies using TXB_2 have shown that both metabolites are formed equally, although 11-dehydro TXB_2 has a longer circulating half-life ($t_{1/2}$ = 45 minutes). Therefore, measurement of 11-dehydro TXB_2 in plasma or urine will give a time-integrated indication of TXA_2 production.

96 strip/solid wells
480 strip/solid wells



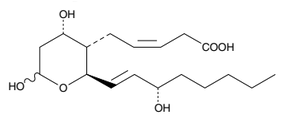
2,3-dinor Thromboxane B_2 19050

[63250-09-9]

MF: $C_{18}H_{30}O_6$ **FW:** 342.4 **Purity:** ≥98%*

A solution in methyl acetate **Stability:** ≥1 year at -20°C

Summary: An abundant urinary metabolite of TXB_2 that can be used as a marker for TXA_2 synthesis *in vivo*



**All 5-cis 2-series PGs (those containing a 5,6-double bond) will contain a small amount of the 5-trans isomer. This isomer is generally undetectable using normal phase silica columns and plates, but may be resolved using RP-HPLC. The purity for all such 2-series PGs excludes the 1-3% trans isomer which will generally be present.*

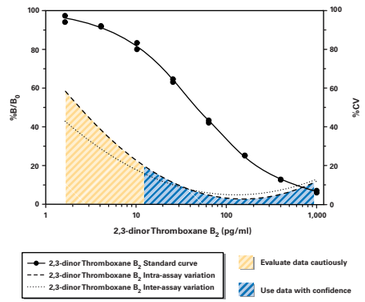
2,3-dinor Thromboxane B_2 EIA Kit 519051

Stability: ≥1 year at -20°C

Sensitivity: 50% B/B_0: 35 pg/ml • 80% B/B_0: 7 pg/ml

Summary: TXA_2 is produced from arachidonic acid by many cells and causes irreversible platelet aggregation and vascular and bronchial smooth muscle contraction. TXA_2 is rapidly hydrolyzed non-enzymatically to form TXB_2. Although it is common to estimate TXA_2 levels by measuring TXB_2, most of the TXB_2 measured is due to *ex vivo* platelet activation or intra-renal production. Measurement errors are compounded by the fact that normal concentrations of circulating TXB_2 are extremely low (1-2 pg/ml), and highly transient ($t_{1/2}$ = 5-7 minutes). To circumvent this problem, it is necessary to measure a metabolite that cannot be formed by platelets or by the kidney. TXB_2 may be metabolized by 11-hydroxy TX dehydrogenase to form 11-dehydro TXB_2, or by β-oxidation to form 2,3-dinor TXB_2. Infusion studies using TXB_2 have shown that both metabolites are formed equally, but that the circulating half-life of 2,3-dinor TXB_2 is shorter ($t_{1/2}$ = 15 minutes). Therefore, measurement of 2,3-dinor TXB_2 will give a more episodic indication of TXA_2 production.

96 strip/solid wells
480 strip/solid wells



Thromboxane B_3 19990

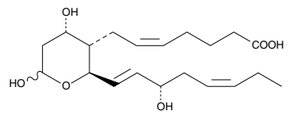
[71953-80-5] Δ^{17}-TXB$_2$

MF: $C_{20}H_{32}O_6$ **FW:** 368.5 **Purity:** ≥98%*

A solution in methyl acetate **Stability:** ≥2 years at -20°C

Summary: Stable hydrolysis product of TXA_3 synthesized from EPA by COX and TX synthase

50 µg
100 µg
500 µg
1 mg



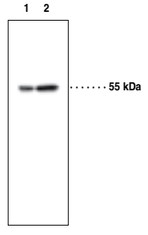
•Also Available: **11-dehydro Thromboxane B$_3$** (19995)

Thromboxane Synthase Polyclonal Antibody 160715

Affinity-purified IgG **Stability:** ≥1 year at -20°C

Summary: Antigen: human thromboxane synthase amino acids 359-377 • Host: rabbit • Cross Reactivity: (+) human, porcine, murine, and rat TX synthase • Application(s): IHC and WB • TX synthase catalyzes the conversion of PGH_2 to TXA_2, which is a potent vasoconstrictor and inducer of platelet aggregation.

500 µl



Lane 1: Human platelet microsomes (10 µg)
Lane 2: Human platelet microsomes (30 µg)

•Also Available: **Thromboxane Synthase Blocking Peptide** (360715)

TOFA 10005263

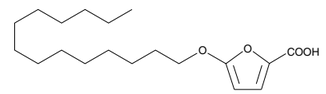
[54857-86-2] RMI 14514, 5-(Tetradecyloxy)-2-Furoic Acid

MF: $C_{19}H_{32}O_4$ **FW:** 324.5 **Purity:** ≥98%

A crystalline solid **Stability:** ≥2 years at -20°C

Summary: An inhibitor of fatty acid synthesis that blocks the synthesis of malonyl-CoA by acetyl-CoA carboxylase

5 mg
10 mg
50 mg
100 mg



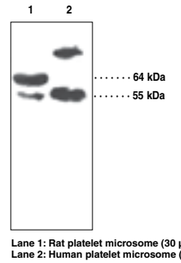
TP Receptor (human) Polyclonal Antibody 10004452

Thromboxane A_2 Receptor

Peptide affinity-purified IgG **Stability:** ≥1 year at -20°C

Summary: Antigen: human TP receptor C-terminal amino acids 323-343 • Host: rabbit • Cross Reactivity: (+) human, murine, rat, and Cos-7 (African green monkey) TP receptor • Application(s): ICC and WB • The TP receptor is a GPCR that mediates the action of TXA_2.

500 µl



Lane 1: Rat platelet microsome (30 µg)
Lane 2: Human platelet microsome (30 µg)

•Also Available: **TP Receptor (human) Blocking Peptide** (10009368)

TP Receptor (human) Polyclonal FITC Antibody 10012559

Thromboxane A_2 Receptor

Fluorescein-labeled peptide affinity-purified IgG **Stability:** ≥1 year at -20°C

Summary: Antigen: human TP receptor C-terminal amino acids 323-343 • Host: rabbit • Cross Reactivity: (+) Human, murine, rat, and Cos-7 (African green monkey) TP receptor • Application(s): FC, IF, and WB • The TP receptor is a GPCR that mediates the action of TXA_2.

500 µl

TP Receptor (murine) Polyclonal Antibody 101882

Thromboxane A_2 Receptor

Affinity-purified IgG **Stability:** ≥1 year at -20°C

Summary: Antigen: murine TP receptor amino acids 275-289 • Host: rabbit • Cross Reactivity: (+) human, murine, rat, Cos-7 (African green monkey), and bovine TP receptor (able to detect both TPα and TPβ isoforms) • Application(s): IHC and WB • The TP receptor is a GPCR that mediates the action of TXA_2.

500 µl

•Also Available: **TP Receptor (murine) Blocking Peptide** (10004110)

Treprostinil 10162

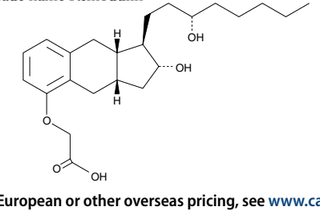
[81846-19-7]

MF: $C_{23}H_{34}O_5$ **FW:** 390.5 **Purity:** ≥98%

A crystalline solid **Stability:** ≥2 years at -20°C

Summary: A stable analog of PGI_2 that is used clinically for the treatment of primary pulmonary hypertension under the trade name Remodulin™

1 mg
5 mg
10 mg
50 mg

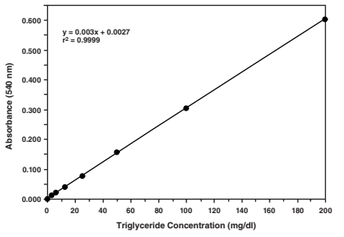


Triglyceride Assay Kit 10010303

Stability: ≥6 months at -20°C

Summary: The measurement of TG levels are useful in the diagnosis of primary and secondary hyperlipoproteinemia, dyslipidemia, and triglyceridemia. Cayman's TG Assay provides a simple, reproducible, and sensitive tool for measuring TGs in plasma and serum. The assay is initiated with the enzymatic hydrolysis of TGs by lipase to produce glycerol and free fatty acids. The glycerol released is subsequently measured by a coupled enzymatic reaction system with a colorimetric readout at 540 nm.

96 wells



U-18666A 10009085

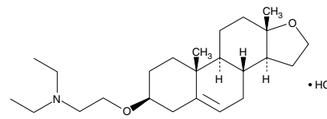
[3039-71-2]

MF: $C_{24}H_{41}NO_2$ • HCl **FW:** 412.1 **Purity:** ≥95%

A crystalline solid **Stability:** ≥2 years at -20°C

Summary: A cell permeable drug that inhibits cholesterol trafficking from late endosomes/lysosomes to the ER, but not to the plasma membrane

5 mg
10 mg
25 mg
50 mg



U-44069 16440

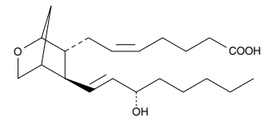
[56985-32-1] 9,11-epoxymethano PGH$_2$, 9,11-dideoxy-9α,11α-epoxymethano PGF$_{2\alpha}$

MF: $C_{21}H_{34}O_4$ **FW:** 350.5 **Purity:** ≥98%*

A solution in methyl acetate **Stability:** ≥2 years at -20°C

Summary: A stable analog of PGH_2 and a TP receptor agonist; stimulates shape change in human platelets without a measurable increase in Ca^{2+} with an EC_{50} value of 1.8 nM

1 mg
5 mg
10 mg
50 mg



U-46619 16450

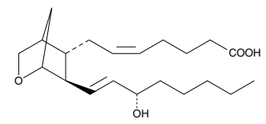
[56985-40-1] 9,11-dideoxy-9α,11α-methanoepoxy PGF$_{2\alpha}$

MF: $C_{21}H_{34}O_4$ **FW:** 350.5 **Purity:** ≥98%*

A solution in methyl acetate **Stability:** ≥2 years at -20°C

Summary: A stable analog of PGH_2 and a TP receptor agonist; exhibits EC_{50} values of 4.8, 6.0, and 7.3 nM for shape change in human, rat, and rabbit platelets, respectively, and 82, 145, and 65 nM for aggregation, respectively

1 mg
5 mg
10 mg
50 mg



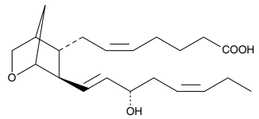
Inhibitors of Lipoprotein Modifying Enzymes				
Item No.	**Item Name**	**Target Enzyme**	**IC_{50} values**	**Sizes**
10006482	CAY10485	ACAT-1 and 2	96 µM ACAT-1; 81 µM ACAT-2	5 mg • 10 mg • 50 mg • 100 mg
10006452	CAY10486	ACAT-1 and 2	60 µM (both enzymes)	5 mg • 10 mg • 25 mg • 50 mg
10007875	CAY10499	Hormone Sensitive Lipase	90 nM (human)	1 mg • 5 mg • 10 mg • 25 mg
10006782	Oleic Acid-2,6-diisopropylanilide	ACAT	7 nM	5 mg • 10 mg • 50 mg • 100 mg
10006529	Oleyl Anilide	ACAT	26 µM	5 mg • 10 mg • 50 mg • 100 mg

For a full product listing, please visit www.caymanchem.com

Δ^{17}-U-46619 16460

MF: $C_{21}H_{32}O_4$ **FW:** 348.5 **Purity:** ≥98%*
A solution in methyl acetate **Stability:** ≥2 years at -20°C
Summary: A stable analog of TXA_3 and U-46619

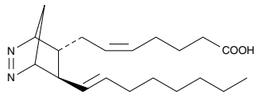
50 µg
100 µg
500 µg
1 mg



U-51605 16465

[64192-56-9]
MF: $C_{20}H_{32}N_2O_2$ **FW:** 332.5 **Purity:** ≥98%*
A solution in methyl acetate **Stability:** ≥1 year at -20°C
Summary: A stable analog of PGH_2 that acts as an inhibitor of both PGI and TX synthases

100 µg
500 µg
1 mg
5 mg



Vasoactive Eicosanoid HPLC Mixture 10003

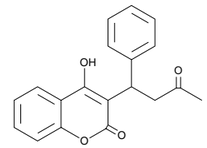
Purity: ≥98% for each compound
A solution in methyl acetate **Stability:** ≥6 months at -20°C
Summary: Contains TXB_2, 11-dehydro TXB_2, 6-keto $PGF_{1\alpha}$, 2,3-dinor-6-keto $PGF_{1\alpha}$ (100 µg each), and 12(S)-HHTrE (5 µg)

1 ea

(±)-Warfarin 13566

[81-81-2] Athrombine-K, Coumadin, Coumafene, WARF 42, Zoocoumarin
MF: $C_{19}H_{16}O_4$ **FW:** 308.3 **Purity:** ≥98%
A crystalline solid **Stability:** ≥2 years at -20°C
Summary: An anti-coagulant used to prevent heart attacks, stroke, and the formation of blood clots; also used as a rodenticide

100 mg
250 mg
500 mg
1 g



•Also Available: **(+)-Warfarin** (13526)
(-)-Warfarin (13531)

**All 5-cis 2-series PGs (those containing a 5,6-double bond) will contain a small amount of the 5-trans isomer. This isomer is generally undetectable using normal phase silica columns and plates, but may be resolved using RP-HPLC. The purity for all such 2-series PGs excludes the 1-3% trans isomer which will generally be present.*

Alphabetical Index

Item Number Index