METABOLISM AND METABOLIC DISEASE
Introduction to

Metabolism and Metabolic Disease

Of all of the cephalopods, the nautilus (our current cover creature) perhaps suffers most from lack of face recognition. Sure, many are familiar with the iconic shell, with its colorful patterning and intriguing spiral. However, squids and octopi are much better known, having landed major roles in movies, cartoons, and menus. Still, the curious scientist would do well to ponder the eye of the nautilus, peeking out from under its mantle, and the collection of tentacles organized around the mouth. These features emerged, along with a wide variety of diverse lifeforms, during the Cambrian explosion, some 500 million years ago. While many organisms either evolved or went extinct, the nautilus has proven to have a truly exceptional body plan that has prospered with little need for modification to this day.

The nautilus may be the perfect poster creature for metabolism, representing millions of years of successful health with no evidence of obesity, diabetes, or hypertension. Compare that track record with the checkered past of certain hominids. *Homo sapiens*, the most recent of a series of *Homo* species that can be traced back to the Pliocene some 2 million years ago, is also the only *Homo* species that has not yet become extinct. Today, over 75% of American adults over 20 years of age are overweight or obese, while some 20% of children aged 6-19 have a BMI-for-age at the 95th percentile or higher. Among American adults, obese individuals, comprising greater than 40% of the total population, surpass the number of overweight adults, at around 34%. As obesity increases the likelihood of developing heart disease, type 2 diabetes, and a host of other diseases, the condition represents one of the leading preventable causes of morbidity and mortality.

*Homo Sapiens* paradoxically finds itself metabolically maladapted for a nutritional environment that is largely of its own making — but there is hope through research. Cayman’s goal is to make your research possible. In this catalog, you will find the best reagents, assay kits, proteins, and antibodies for research related to metabolism. Many more products can be found on our website (caymanchem.com). We are constantly expanding our product line, so feel free to register for new product emails that are tailored to your specific area of interest. We want to help you with your next great discovery!
### Table of Contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Targeting PPARs/δs For Weight Loss: Exercise in a Pill</td>
</tr>
<tr>
<td>6</td>
<td>Antibodies</td>
</tr>
<tr>
<td>13</td>
<td>Biochemicals</td>
</tr>
<tr>
<td>14</td>
<td>Weight Loss: A New Star is Irisin</td>
</tr>
<tr>
<td>27</td>
<td>Kits</td>
</tr>
<tr>
<td>30</td>
<td>Sirtuins, to your health</td>
</tr>
<tr>
<td>40</td>
<td>The PPARs Story</td>
</tr>
<tr>
<td>49</td>
<td>Proteins</td>
</tr>
<tr>
<td>52</td>
<td>Index</td>
</tr>
</tbody>
</table>

---

### Ordering Information

Orders are accepted by telephone, fax, mail, e-mail, or on the Cayman Chemical website. We will accept telephone orders Monday through Thursday from 8 AM to 5:30 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 to avoid possibility of duplication.

### Domestic Shipments

In most instances we ship FedEx Standard Overnight Delivery (not available to all locations), with delivery by 3:30 PM 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 to ship 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  
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 boxes.)
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. UPS, Sunday only, drawn on a U.S. bank.
2. 2% 30 days.
3. P.O. Box 650, Ann Arbor, Michigan, U.S.A.
4. Bank fees and wire transfer fees are not to be deducted from the invoice amount.

### Returns

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 the order was not shipped within 14 days after receiving the material. Cayman Company reserves the right to inspect all returned materials. The end-user assumes full responsibility for appropriate licensing and/or non-infringement for any proprietary claim or patent.
Targeting PPARβ/δ For Weight Loss: Exercise in a Pill

First, understand this history tells us to beware of the side effects of therapeutic drugs. In the early 1990s, Fen Phen was approved by the FDA for weight control in the seriously obese. Heavily marketed to the weight-conscious public, Fen Phen became known as the “miracle pill” and was used by millions for quick and effective weight loss. Fen Phen is a combination of fenfluramine, which suppresses appetite, and with phentermine, a stimulant. Fenfluramine and phentermine introduced two decades earlier with little fanfare, increased serotonin levels, which, in the central nervous system, produces the desired effect on food intake (Figure 1). Unfortunately, by the time Fen Phen was released, the dark side of fenfluramine was beginning to be revealed. Serotonin also activates receptors on cardiovascular tissues, slowly stimulating mitogenesis. By the 1990s, evidence was accumulating that prolonged use of fenfluramine caused serious, if not fatal, cardiac and pulmonary complications. Specifically, fenfluramine produced heart valve defects through abnormal growth of heart tissue as well as in primary pulmonary hypertension, which must have been related to changes in heart function secondary to the valve defects. Naturally, these changes in cardiovascular function were not reversed when drug use stopped. With 18 million prescriptions written for Fen Phen in 1996 in the United States alone, the public served as unwitting guinea pigs, demonstrating that the same side effects of fenfluramine were evident in Fen Phen. Law suits damages resulting from persistent cardiovascular disease, the cost of trying to drug use stopped. With 18 million prescriptions written for Fen Phen in 1996 in the United States alone, the public served as unwitting guinea pigs, demonstrating that the same side effects of fenfluramine were evident in Fen Phen. Law suits damages resulting from persistent cardiovascular disease, the cost of trying to

Now banned, Fen Phen has faded from public prattle; this is unfortunate, because the next “miracle pill” are already emerging. The Fen Phen experience reminds us that drugs must model pathways of physiological processes

GW 1516: Actions Through PPARβ/δ The peroxisome proliferator-activated receptors (PPARs) are nuclear receptors which bind, with retinoid X receptors (RXR), to specific peroxisome proliferator response elements (PPRE) to regulate gene expression. PPARs is abundant in liver as well as in kidney, heart, brown adipose, intestine, and muscle. Activated by the synthetic agonists known as fenfluramine (e.g., fenfluramine, clofibrate), PPARs alters gene expression relevant to altered lipid metabolism, lowering triglycerides, and raising HDL in dyslipidemia. PPARδ, abundant in adipose and other tissues, is activated by glucones (e.g., triglucosamine, rosiglitazone) to reduce hyperglycemia associated with type 2 diabetes. PPARδ, described by a European group studying Xenopus (frog), was found to be identical to PPARδ, identified by an American group studying mice.1,2 Less is known about PPARδ. A recent GW 1516 signaling pathways (Figure 2) suggests that this isoform is less focused on lipid metabolism than either PPARα or PPARδ. However, a selective partial agonist for PPARδ was found to correct plasma lipid parameters. PPARβ/δ agonists in vivo and in vitro reduced insulin sensitivity in high fat fed ApoB100/CEPT-transgenic mice, suggesting that partial agonists of PPARβ/δ might be useful in treating dyslipidemia.3 Intriguingly, PPARδ agonists also stimulated fatty acid oxidation in muscle cells. Could a PPARβ/δ agonist be a fat burner?

Figure 3. Biochemical and cellular pathways common to GW 1516-exercise and PPARβ/δ exercise. An arrowhead indicates induction and a block indicates repression (Supplementary).558-565 (1995).

References

Adipose Triglyceride Lipase (ATGL, Desnutrin, PLA2) Polyclonal Antibody

**Antigen:** human ATGL amino acids 382-400 • Host: rabbit • Cross Reactivity: (+) human and mouse AdPLA2; (-) mouse ATGL; (-) mouse ANGPTL3 • Application(s): IHC, IHC, 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. Stability: ≥6 months at -20°C

**Antigen:** human ATGL amino acids 382-400 • Host: rabbit • Cross Reactivity: (+) human and mouse AdPLA2; (-) mouse ATGL; (-) mouse ANGPTL3 • Application(s): IHC, IHC, 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. Stability: ≥6 months at -20°C

**Antigen:** recombinant mouse ANGPTL3 • Host: rat, clone Kairos-60 • Cross Reactivity: (+) human ANGPTL3; (-) human ANGPTL isoforms 1, 2, 4, 6, and 7 • Application(s): ELISA and WB • ANGPTL3 regulates angiogenesis and also directly regulates lipid, glucose, and energy metabolism. Stability: ≥6 months at -20°C

**Antigen:** recombinant mouse ANGPTL3 • Host: rat, clone Kairos-60 • Cross Reactivity: (+) human ANGPTL3; (-) human ANGPTL isoforms 1, 2, 4, 6, and 7 • Application(s): ELISA and WB • ANGPTL3 regulates angiogenesis and also directly regulates lipid, glucose, and energy metabolism. Stability: ≥6 months at -20°C

**Antigen:** human FTO amino acids 19-32 • Host: mouse, clone FT 86-4 • Cross Reactivity: (+) human, mouse, rat, porcine, and canine EL; Application(s): IF, IHC, and WB • FTO is a major genetic determinant for the concentration, structure, and metabolism of HDL, which prevents against atherosclerosis. Stability: ≥6 months at -20°C

**Antigen:** recombinant human ANGPTL6 • Host: mouse, clone Kairos-60-574 • Cross Reactivity: (+) human ANGPTL6; (-) human ANGPTL isoforms 1, 2, 3, 4, 5, 6, and 7 • Application(s): ELISA and WB • ANGPTL6 regulates angiogenesis and also directly regulates lipid, glucose, and energy metabolism. Stability: ≥6 months at -20°C

**Antigen:** recombinant human ANGPTL6 • Host: mouse, clone Kairos-60-574 • Cross Reactivity: (+) human ANGPTL6; (-) human ANGPTL isoforms 1, 2, 3, 4, 5, 6, and 7 • Application(s): ELISA and WB • ANGPTL6 regulates angiogenesis and also directly regulates lipid, glucose, and energy metabolism. Stability: ≥6 months at -20°C

**Antigen:** recombinant mouse ANGPTL8 • Host: mouse, clone Kairos-58-208 • Cross Reactivity: (+) human ANGPTL8; (-) mouse ANGPTL8 • Application(s): ELISA and WB • ANGPTL8 regulates angiogenesis and also directly regulates lipid, glucose, and energy metabolism. Stability: ≥6 months at -20°C

**Antigen:** recombinant mouse ANGPTL8 • Host: mouse, clone Kairos-58-208 • Cross Reactivity: (+) human ANGPTL8; (-) mouse ANGPTL8 • Application(s): ELISA and WB • ANGPTL8 regulates angiogenesis and also directly regulates lipid, glucose, and energy metabolism. Stability: ≥6 months at -20°C

**Antigen:** recombinant mouse ANGPTL9 • Host: mouse, clone Kairos-58-208 • Cross Reactivity: (+) human ANGPTL9; (-) mouse ANGPTL9 • Application(s): ELISA and WB • ANGPTL9 regulates angiogenesis and also directly regulates lipid, glucose, and energy metabolism. Stability: ≥6 months at -20°C

**Antigen:** recombinant mouse ANGPTL9 • Host: mouse, clone Kairos-58-208 • Cross Reactivity: (+) human ANGPTL9; (-) mouse ANGPTL9 • Application(s): ELISA and WB • ANGPTL9 regulates angiogenesis and also directly regulates lipid, glucose, and energy metabolism. Stability: ≥6 months at -20°C
For Mass- and Obesity-associated Protein, FTO
A 1 mg/ml solution in PBS, pH 7.4 • Stability: 6 months at -20°C
Summary: Antigen: recombinant human FTO • Host: mouse, clone FT-624-6 • Isotype: IgG1 • Cross Reactivity: (+) mouse FTO, (-) rat FTO • Application(s): ELISA, IHC, IF and WB • FTO is associated with type 2 diabetes and positively correlates with other symptoms of the metabolic syndrome, including higher fasting insulin, glucose, and triglycerides, and lower HDL-cholesterol.

FTO (mouse) Monoclonal Antibody [Clone FT 342-1]
10815
Far Mass- and Obesity-associated Protein, FTO
A 1 mg/ml solution in PBS, pH 7.4 • Stability: 6 months at -20°C
Summary: Antigen: recombinant mouse FTO • Host: rat, clone FT-342-1 • Isotype: IgG2a • Cross Reactivity: (+) human GPR40 • Application(s): IHC • GPR40 is a GPCR found predominantly in the β-cells of the pancreas that has been implicated in the regulation of insulin secretion. Overexpression of GPR40 in mouse β-cells leads to glucose tolerance suggesting a link between GPR40 expression and diabetes.

GPR40 Polyclonal Antibody 10007205
PROBE, Full Fatty Acid Receptor, G-Protein-Coupled Receptor 40 Peptide affinity-purified IgG • Stability: ≥1 year at -20°C
Summary: Antigen: human GPR40 amino acids 210-222 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat GPR40; (-) Application(s): ELISA and WB • FTO is associated with type 2 diabetes and positively correlates with other symptoms of the metabolic syndrome, including higher fasting insulin, glucose, and triglycerides, and lower HDL-cholesterol.

11β-Hydroxysteroid Dehydrogenase (Type 1) Polyclonal Antibody 10004303
Cortisone 11β-HSD1 Peptide affinity-purified IgG • Stability: ≥1 year at -20°C
Summary: Antigen: human HSL amino acids 731-741 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat HSL • Application(s): WB • HSL catalyzes the hydrolysis of triglycerides, as well as cholesterol esters. 500 µl

11β-Hydroxysteroid Dehydrogenase (Type 2) Polyclonal Antibody 10004549
Cortisol 11β-HSD2 Peptide affinity-purified IgG • Stability: ≥1 year at -20°C
Summary: Antigen: human 11β-HSD1 amino acids 77-92 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat 11β-HSD1; Application(s): IHC (paraffin-embedded sections) and WB • 11β-HSD1 catalyzes the conversion of inactive cortisone to active cortisol in adipose tissue. Over-expression of 11β-HSD1 results in visceral obesity and the metabolic syndrome including insulin-resistant diabetes, hypertension, and hyperlipidemia.

MCAD Polyclonal Antibody 101730
Medium-chain Fatty Acyl CoA Dehydrogenase Protein A-purified IgG • Stability: 2 years at -20°C
Summary: Antigen: recombinant mouse MCAD • Host: rabbit • Cross Reactivity: (+) human, porcine, ovine, and mouse MCAD • Application(s): WB • MCAD is a mitochondrial enzyme that catalyzes the first step in the β-oxidation of fatty acids. Its expression is induced during periods of fasting and is regulated by PPARα, a ligand-activated transcription factor involved in the regulation of lipid homostasis. MCAD expression can be used as a marker to evaluate the in vivo activity of PPARα.

Visfatin Polyclonal Antibody 10007662
LILP Peptide affinity-purified IgG • Stability: ≥1 year at -20°C
Summary: Antigen: human LIPE amino acids 731-741 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat LIPE • Application(s): WD and WB • Visfatin was shown in several studies to have insulin-like effects, lowering blood glucose and improving insulin sensitivity. Serum levels of NAMPT correlate with obesity.

11β-Hydroxysteroid Dehydrogenase Blocking Peptide 10007729
• Also Available: 11β-Hydroxysteroid Dehydrogenase (Type 1) Blocking Peptide 10007729

LDL Receptor Blocking Peptide 10007665
LDLR Affinity-purified IgG • Stability: ≥1 year at -20°C
Summary: Antigen: mouse LDL receptor amino acids 499-511 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat LDL receptor • Application(s): ICC, IHC, IF and WB • The LDLR is a cell surface glycoprotein that scavenges LDL from the blood and regulates plasma LDL cholesterol.

MC4R Polyclonal Antibody 10006359
Melanocortin-4 Receptor Peptide affinity-purified IgG • Stability: ≥1 year at -20°C
Summary: Antigen: mouse MC4R amino acids 21-33 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat MC4R • Application(s): IHC (formalin-fixed paraffin-embedded sections) and WB • MC4R receptor plays a critical role in appetite regulation and is a prime target for therapeutic intervention in obesity.

For Laboratory Use Only, Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com.
PCSK9 (human) Polyclonal Antibody 10007185

**NARC-1, Proprotein Convertase Subtilisin 9**

**PCSK9 (human)**

**Antigen:** recombinant human PCSK9 • Host: mouse, clone 15A6 • Isoform: IgG1 • Cross Reactivity: (+) human, mouse, and rat • Application(s): ICC, WB, and PEPCK (mouse) Blocking Peptide

**Summary:** Antigen: mouse recombinant PCSK9 amino acids 490-592 • Host: rabbit • Cross Reactivity: (+) mouse and rat PCSK9 • Application(s): WB

**Stability:** ≥1 year at -20°C

**Reactivity:** (+) human recombinant PCSK9

**Application(s):** ICC, IF, and WB

**500 µl**

---

**PCSK9 (mouse) Polyclonal Antibody 10008811

**NARC-1, Proprotein Convertase Subtilisin 9**

**PCSK9 (mouse)**

**Antigen:** mouse PCSK9 amino acids 152-163 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat PEPCK protein amino acids 5-17 • Application(s): ICC, IF, and WB

**Summary:** Antigen: mouse recombinant PCSK9 amino acids 490-592 • Host: rabbit • Cross Reactivity: (+) mouse and rat PCSK9 • Application(s): ICC, IF, and WB

**Stability:** ≥2 years at -20°C

**Reactivity:** (+) mouse and rat PEPCK protein

**Application(s):** WB

**500 µl**

---

**PPARα Polyclonal Antibody 1001700

**NARC-1, Proprotein Convertase Subtilisin 9**

**PPARα**

**Antigen:** mouse PPARα amino acids 82-101 (amino acids 110-129 of PPARα2) • Host: rabbit • Cross Reactivity: (+) human, mouse, ovine, porcine, and rat PPARδ • Application(s): WB

**Summary:** Antigen: mouse recombinant PPARα amino acids 82-101 (amino acids 110-129 of PPARα2) • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat PPARδ • Application(s): WB

**Stability:** ≥2 years at -20°C

**Reactivity:** (+) human, mouse, ovine, porcine, and rat PPARδ

**Application(s):** WB

**500 µl**

---

**PPARβ Polyclonal Antibody 1001710

**NARC-1, Proprotein Convertase Subtilisin 9**

**PPARβ**

**Antigen:** mouse PPARβ amino acids 23-56 • Host: rabbit • Cross Reactivity: (+) human, mouse, rat, ovine, and porcine PPARβ1 (PPARβ) • Application(s): WB

**Summary:** Antigen: mouse recombinant PPARβ amino acids 23-56 • Host: rabbit • Cross Reactivity: (+) human, mouse, rat, ovine, and porcine PPARβ1 (PPARβ) • Application(s): WB

**Stability:** ≥2 years at -20°C

**Reactivity:** (+) human, mouse, rat, ovine, and porcine PPARβ1 (PPARβ)

**Application(s):** WB

**500 µl**

---

**PPARγ Polyclonal Antibody 101700

**NARC-1, Proprotein Convertase Subtilisin 9**

**PPARγ**

**Antigen:** mouse PPARγ amino acids 82-101 (amino acids 110-129 of PPARγ2) • Host: rabbit • Cross Reactivity: (+) human, mouse, ovine, porcine, and rat PPARδ • Application(s): WB

**Summary:** Antigen: mouse recombinant PPARγ amino acids 82-101 (amino acids 110-129 of PPARγ2) • Host: rabbit • Cross Reactivity: (+) human, mouse, ovine, porcine, and rat PPARδ • Application(s): WB

**Stability:** ≥2 years at -20°C

**Reactivity:** (+) human, mouse, ovine, porcine, and rat PPARδ

**Application(s):** WB

**500 µl**

---

**PGC-1 Polyclonal Antibody 101707

**NARC-1, Proprotein Convertase Subtilisin 9**

**PGC-1**

**Antigen:** human PGC-1 amino acids 75-90 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat PGC-1α and PGC-1β • Application(s): IHC (paraffin-embedded sections) and WB

**Summary:** Antigen: human PGC-1 amino acids 75-90 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat PGC-1α and PGC-1β • Application(s): IHC (paraffin-embedded sections) and WB

**Stability:** ≥2 years at -20°C

**Reactivity:** (+) human, mouse, and rat PGC-1α and PGC-1β • Application(s): IHC (paraffin-embedded sections) and WB

**Application(s):** IHC, and WB

**500 µl**

---

**PPARδ Blocking Peptide 10009581

**NARC-1, Proprotein Convertase Subtilisin 9**

**PPARδ**

**Antigen:** human PPARδ amino acids 75-90 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat PPARδ • Application(s): WB

**Summary:** Antigen: human PPARδ amino acids 75-90 • Host: rabbit • Cross Reactivity: (+) human, mouse, and rat PPARδ • Application(s): WB

**Stability:** ≥2 years at -20°C

**Reactivity:** (+) human, mouse, and rat PPARδ • Application(s): WB

**Application(s):** WB

**500 µl**

---

**PPARβ Blocking Peptide 10007475

**NARC-1, Proprotein Convertase Subtilisin 9**

**PPARβ**

**Antigen:** mouse PPARβ amino acids 82-101 (amino acids 110-129 of PPARβ2) • Host: rabbit • Cross Reactivity: (+) human, mouse, ovine, porcine, and rat PPARδ • Application(s): WB

**Summary:** Antigen: mouse PPARβ amino acids 82-101 (amino acids 110-129 of PPARβ2) • Host: rabbit • Cross Reactivity: (+) human, mouse, ovine, porcine, and rat PPARδ • Application(s): WB

**Stability:** ≥2 years at -20°C

**Reactivity:** (+) human, mouse, ovine, porcine, and rat PPARδ • Application(s): WB

**Application(s):** WB

**500 µl**

---

**PPARγ Blocking Peptide 10007186

**NARC-1, Proprotein Convertase Subtilisin 9**

**PPARγ**

**Antigen:** human PPARγ amino acids 110-129 • Host: rabbit • Cross Reactivity: (+) human, mouse, ovine, porcine, and rat PPARδ • Application(s): WB

**Summary:** Antigen: human PPARγ amino acids 110-129 • Host: rabbit • Cross Reactivity: (+) human, mouse, ovine, porcine, and rat PPARδ • Application(s): WB

**Stability:** ≥2 years at -20°C

**Reactivity:** (+) human, mouse, ovine, porcine, and rat PPARδ • Application(s): WB

**Application(s):** WB

**500 µl**
### Cayman Chemical 10007612
**Vaspin (Human) Monoclonal Antibody (Clone VP63)**

**Summary:**

A 1 mg/ml solution in PBS, pH 7.4; Stability: ≥1 year at -20°C;

**Reactivity:** (+) human vaspin

**Application(s):** ELISA and WB

**Host:** rabbit

**Antigen:** recombinant human vaspin • Host: mouse, clone VP63 • Cross Reactivity: (+) human, mouse, and rat SREBP-2

**Stability:** A crystalline solid

**MF:** C38H46O7

**Purity:** ≥98%

**FW:** 668.7

**Stability:** ≥1 year at -20°C

**Summary:**

A potent inhibitor of diacylglycerol acyltransferase-1 (IC50 = 7 and 24 nM, for human and mouse, respectively); confers significant weight loss within seven days and significantly reduces plasma and liver triglycerides when administered at 5 mg/kg via diet-induced obesity mice.

### Serum Retinol Binding Protein 4 Blocking Peptide

**SREBP-2 Polyclonal Antibody**

**Summary:**

A crystalline solid

**MF:** C69H111N23O16S

**Purity:** ≥95%

**FW:** 428.5

**Stability:** ≥1 year at -20°C

**Summary:**

A hydrophobic derivative of deoxynojirimycin that potently inhibits β-glucosidase 2 (IC50 = 0.3 µM), lam potent antileukemia glucocerebrosidase synthase (IC50 = 25 µM), but only poorly inhibits other GCase isoforms expressed in hepatic cells, enhances insulin sensitivity, and induces SREBP-regulated gene expression and cholesterolemia synthesis.

### Biochemicals

**6-Aminonicotinamide**

**Summary:**

A less potent APJ agonist than either apelin-17 or apelin-13 (EC 50 = 20, 2.5, and 4,195.9 nM; acts primarily in the periphery and CNS, playing important roles in regulating cardiovascular function, fluid homeostasis, hypertension, and insulin sensitivity **Amino Acid Sequences:** QPRPLSGHVGPMF

**Summary:**

Endogenous ligand of the APJ receptor, with an EC50 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 **Amino Acid Sequences:** QPRPLSGHVGPMF

**Summary:**

A potent, semi-synthetic LXR agonist derived from extracts of the **Cayman Chemical caymanchem.com**

**For Laboratory Use Only. Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com, for current European or other overseas pricing, see caymaneurope.com or contact your local distributor.
Weight Loss: A New Star is Irisin

The hormone irisin looks and acts differently from Iris. This messenger is derived from fibroin type III domain-containing protein 5 (FNDC5), a membrane-spanning protein of 196 aa. Aside from a short signal peptide, FNDC5 predominantly consists of an extracellular region containing the fibroin type III (FnIII) domain, separated from a small cytoplasmic region by the transmembrane section. Irisin is a 112 aa peptide which includes the 91 aa extracellular FnIII domain, cleaved from the carboxy terminus of FNDC5. Full-length domains commonly consist of a combination of beta strands and random coils, as shown in the resolved structure of the FnIII domain of FNDC5 (Ixxx-pdbs, Figure 1). They are found in thousands of different proteins, usually serving to mediate interactions with other molecules (growth factors, enzymes, etc.) or cells. Whatever the mechanism, irisin is, like the goddess Iris, a powerful messenger, sending the signal to determine the function of specific cells.

The Background

Iris and irisin differ somewhat in their beginnings. While Iris was the daughter of Thaumas, a god of the sea, and Elektra, a nymph of the clouds, irisin is induced by FNDC5, also known as peroxisome proliferator-activated receptor-γ (PPAR-γ) coactivator-1α. As suggested by its name, PGClα is a transcriptional coactivator; it enhances the activity of nuclear receptors, like PPAR-γ and PGC1α.

What does a good workout have in common with Zeus, the Greek King of the Gods? A recent study suggests that a protein secreted during exercise targets adipose tissue, ultimately improving both obesity and glucose homeostasis. This protein has been named irisin, after the Greek goddess Iris, who acted as the messenger for Zeus. To help her lift between Mount Olympus and the land of mortals, Iris had golden wings (Figure 1). She was also considered the goddess of rainbows and could move along the colored spectrum between the clouds and the earth or sea. By both wings and rainbows, Iris moved swiftly to carry the messages of Zeus to mortals and immortals.

To help clarify, all adipose tissues, and, indeed, all adipocytes, are not identical. Fat is deposited in ‘depots’ or pads in specific sites, which may be identified generally (subcutaneous or visceral) or more specifically by location (e.g., inguinal [groin], epididymal [testis], perirenal [kidney]). Each site contains a variety of cell types in addition to the adipocytes and has unique features regarding its development and function. More relevant to this article, distinctive types of adipocytes exist. White adipocytes, which contain a single large lipid droplet, populate white adipose tissue. This most familiar form, the bane of dieters, stores excess energy as fat. When other energy sources have been exhausted, white adipocytes hydrolyze triglycerides and export fatty acids to be utilized for energy by other cells. Brown adipocytes, on the other hand, burn fatty acids to generate heat through uncoupled respiration. Cytologically, these cells are described as ‘multilocular’, as they store fat in many small sub-cellular droplets which appear as empty compartments in histological cross-sections. Brown adipocytes also contain numerous mitochondria, which provide the distinctive color. The mitochondria of brown adipocytes express a unique uncoupling protein, UCP1, a multi-pass inner membrane protein which uncouples oxidative phosphorylation from ATP synthesis so that energy is dissipated in the form of heat. These cells are abundant in brown adipose tissue (BAT), which is most commonly found in newborns and hibernating animals. Functional, classical BAT also occurs in a supraciliary depot in healthy adult humans.

Recently, a new type of adipocyte which expresses UCPI+ and metabolizes, rather than stores, lipids has been described. Like brown adipocytes, these new cells have many mitochondria and local lipid droplets, albeit fewer than true brown cells. However, they differ in their origin. Brown adipocytes are derived from the same precursor as skeletal muscle, termed a dertomymocyte, which expresses the homeobox transcription factor Engrailed 1 (E1) and myogenic factor 5 (MyoD5) (Figure 3). Differentiation of dertomymocytes to either myocytes or adipocytes is determined by signaling via bone morphogenetic protein 7 (BMP7) and Wnt. White adipocytes, on the other hand, differentiate from a different precursor which lacks MyoD, presumably a mesodermal stem cell. Again, adipocyte development is promoted by BMPs and blocked by Wnt. The new type of adipocyte can be induced in vivo in WAT depots by chronic β-adrenergic stimulation or by chronic PARP-γ agonist treatment, particularly in the inguinal depot of the mouse. As this cell type is morphologically and functionally similar to brown cells but shares a precursor with white adipocytes, it has been called a ‘brise’ (brown-in-white) adipocyte. Alternatively, it may be referred to as a beige adipocyte or a recruitable or inducible brown adipocyte-like cell. More important than the name, this cell type may serve an important role in regulating energy balance, glucose metabolism, and lipid homeostasis.

Significant Impact

Iris and irisin differ in their actions. Iris afforded the courage of the Trojan War, one of the great Greek clashes, by carrying Zeus’ advice to the Trojan leader Hector (although the Trojan Horse ultimately led to the fall of Troy). Iris, by way of context, may also carry the lessons of diabetes, obesity, and other pathologies that benefit from exercise. ‘Browned’ WAT, produced either by irisin (from FNDC5-expressing adenoviruses) or by transgenic expression of PGP1α, protects against diet-induced obesity and diabetes.1–3 Whether irisin can be developed into a deliverable therapeutic that mimics exercise-induced irisin production remains a major hurdle.

References

Inhibitors of Lipoprotein Modifying Enzymes

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Name</th>
<th>Target Enzyme</th>
<th>IC50 values</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>00005882</td>
<td>CAY10498</td>
<td>ACAT-1 and 2</td>
<td>95 nM</td>
<td>ACAT-1, 95 µM</td>
</tr>
<tr>
<td>00006452</td>
<td>CAY10496</td>
<td>ACAT-1 and 2</td>
<td>60 µM</td>
<td>(both enzymes)</td>
</tr>
<tr>
<td>00006755</td>
<td>CAY10499</td>
<td>Hormone Sensitive Lipase</td>
<td>90 nM (human)</td>
<td>5 mg</td>
</tr>
<tr>
<td>00006782</td>
<td>Oleic Acid 2,6-dioleoylphosphatidylethanolamine</td>
<td>ACAT</td>
<td>7 nM</td>
<td>5 mg</td>
</tr>
<tr>
<td>00006529</td>
<td>Oleyl Anisole</td>
<td>25 µM</td>
<td>5 mg</td>
<td>10 mg</td>
</tr>
</tbody>
</table>

**CAY10486**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Name</th>
<th>Target Enzyme</th>
<th>IC50 values</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>00006455</td>
<td>BAY10157</td>
<td>ACAT-1 and 2</td>
<td>250 µM</td>
<td>(both enzymes)</td>
</tr>
<tr>
<td>00006456</td>
<td>CAY10566</td>
<td>ACAT-1 and 2</td>
<td>82 µM</td>
<td>(both enzymes)</td>
</tr>
</tbody>
</table>

**CAY10566**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Name</th>
<th>Target Enzyme</th>
<th>IC50 values</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0008846</td>
<td>CAY10573</td>
<td>ACAT-1 and 2</td>
<td>25 nM</td>
<td>(both enzymes)</td>
</tr>
<tr>
<td>0012562</td>
<td>CAY10574</td>
<td>ACAT-1 and 2</td>
<td>20 nM</td>
<td>(both enzymes)</td>
</tr>
<tr>
<td>0010255</td>
<td>CAY10575</td>
<td>ACAT-1 and 2</td>
<td>75 nM</td>
<td>(both enzymes)</td>
</tr>
</tbody>
</table>

**CAY10575**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Name</th>
<th>Target Enzyme</th>
<th>IC50 values</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>13140</td>
<td>CAY10587</td>
<td>ACAT-1 and 2</td>
<td>59 µM</td>
<td>(both enzymes)</td>
</tr>
<tr>
<td>1100256</td>
<td>CAY10592</td>
<td>ACAT-1 and 2</td>
<td>20 µM</td>
<td>(both enzymes)</td>
</tr>
</tbody>
</table>

**CAY10592**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Name</th>
<th>Target Enzyme</th>
<th>IC50 values</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>11012536</td>
<td>CAY10601</td>
<td>ACAT-1 and 2</td>
<td>10 µM</td>
<td>(both enzymes)</td>
</tr>
</tbody>
</table>

**CAY10601**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Name</th>
<th>Target Enzyme</th>
<th>IC50 values</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1102562</td>
<td>CAY10610</td>
<td>ACAT-1 and 2</td>
<td>2 µM</td>
<td>(both enzymes)</td>
</tr>
</tbody>
</table>

**CAY10610**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Name</th>
<th>Target Enzyme</th>
<th>IC50 values</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1102562</td>
<td>CAY10611</td>
<td>ACAT-1 and 2</td>
<td>2 µM</td>
<td>(both enzymes)</td>
</tr>
</tbody>
</table>

**CAY10611**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Name</th>
<th>Target Enzyme</th>
<th>IC50 values</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1102562</td>
<td>CAY10612</td>
<td>ACAT-1 and 2</td>
<td>2 µM</td>
<td>(both enzymes)</td>
</tr>
</tbody>
</table>

**CAY10612**
**Cayman Chemical caymanchem.com**

**Biochemicals**

**FMOC-Leucine**

**FW:** 204.28
**Purity:** ≥98%
**FW:** 276.7
**Purity:** ≥98%
**FW:** 347.4
**Purity:** ≥98%
**FW:** 276.7
**Purity:** ≥98%

**Cholesterol Synthesis Inhibitors**

**Item No.** | **Chemical Name** | **Target Enzyme** | **K<sub>i</sub>** | **Stability**
--- | --- | --- | --- | ---
10010237 | Fluvastatin (sodium salt) | HMG-CoA Reductase | 0.3 µM | ≥2 years at -20°C
10010238 | Lovastatin | HMG-CoA Reductase | 0.6 µM | A crystalline solid
10010239 | Lovastatin Hydroxy Acid (sodium salt) | HMG-CoA Reductase | 0.6 µM | A crystalline solid
10010240 | Mevastatin | HMG-CoA Reductase | 1.0 μM | A crystalline solid
10010243 | Proavastatin (sodium salt) | HMG-CoA Reductase | 2.3 µM | A crystalline solid
10006415 | Ro 48-8071 | Osteoblastocyte Cytotox | IC<sub>50</sub> = 15-6.5 HM | ≥2 years at -20°C
10010334 | Simvastatin | HMG-CoA Reductase | 0.12 µM | A crystalline solid

**Fluvastatin (sodium salt)**

**FW:** 353.4
**Purity:** ≥98%

**FW:** 478.5
**Purity:** ≥98%

**FW:** 234.5
**Purity:** ≥98%

**FW:** 276.7
**Purity:** ≥98%

**FW:** 347.4
**Purity:** ≥98%

**FW:** 276.7
**Purity:** ≥98%

**Hesperetin**

**FW:** 204.28
**Purity:** ≥98%

**FW:** 276.7
**Purity:** ≥98%

**FW:** 347.4
**Purity:** ≥98%

**FW:** 276.7
**Purity:** ≥98%

**FW:** 347.4
**Purity:** ≥98%

**FW:** 276.7
**Purity:** ≥98%

**GW 7647**

**FW:** 624.5
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%

**FW:** 1058.9
**Purity:** ≥98%
50 mg
10 mg
5 mg
daily for 14 days; stimulates cholesterol catabolism to bile acids without affecting cholesterol up to 40% when administered to humans at a dose of 50-200 µg once daily for 14 days; stimulates cholesterol reduction without affecting cholesterol synthesis

**Summary:**

A crystalline solid

≥2 years at -20°C

**(R)-Lisofylline 13616**

**MF:**

C$_{24}$H$_{36}$O$_{5}$

**FW:**

280.3

**Purity:**

≥98%

An inhibitor of ACAT with an IC$_{50}$ value of 7 nM

**Summary:**

A crystalline solid

≥1 year at -20°C

A solution in methyl acetate

**Oleic Acid-2,6-disopropylprolylamine 10006782**

**MF:**

C$_{20}$H$_{36}$N$_{2}$O$_{2}$S

**FW:**

586.7

**Purity:**

≥98%

**Orlistat 10005426**

**MF:**

C$_{36}$H$_{40}$O$_{5}$N$_{2}$

**FW:**

737.6

**Purity:**

≥98%

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

**Summary:**

An anti-obesity drug that inhibits gastric, pancreatic, and carboxyl ester lipase, preventing hydrolysis of triglycerides to free fatty acids and monoglycerides; partially inhibits human recombinant diacylglycerol lipase-α (Ec50 = 0.6 mM) and at 1 µM inhibits the formation of 2-traditionally generated free fatty acids

≥2 years at -20°C

A neat oil

C$_{16}$H$_{30}$O$_{2}$

**MF:**

[373-49-9] 9-cis-Hexadecenoic Acid, Palmitoleate, n-7 Palmitoleate, cis-Palmitoleic Acid

**FW:**

254.4

**Purity:**

≥95%

**PPAR Ligands**

**Item No.** | **Product Name** | **Target** | **Mode of Action** | **Effective Concentration** | **Sizes**
--- | --- | --- | --- | --- | ---
100038 | Palmitic Acid | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100035 | Oleic Acid Ethanolamide | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100036 | Linoleic Acid | Antagonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100037 | Linoleic Acid Ethanolamide | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100039 | Palmitoleic Acid | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100040 | Linolenic Acid | Antagonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100041 | N-0xidized Linoleic Acid Ethanolamide | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100042 | N-0xidized Linolenic Acid Ethanolamide | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100043 | Linolenic Acid Ethanolamide | Antagonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100044 | Linoleic Acid-d$_{14}$ | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100045 | Linoleic Acid-ethyl ester | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100046 | Palmitic Acid-d$_{14}$ | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100047 | Palmitoleic Acid | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100048 | Linolenic Acid-d$_{14}$ | Antagonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100049 | Linolenic Acid-ethyl ester | Antagonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100050 | N-0xidized Palmitic Acid Ethanolamide | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100051 | N-0xidized Palmitoleic Acid Ethanolamide | Agonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100052 | N-0xidized Linoleic Acid-ethyl ester | Antagonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100053 | N-0xidized Linolenic Acid-ethyl ester | Antagonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100054 | Linolenic Acid-d$_{14}$-ethyl ester | Antagonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg
100055 | Linolenic Acid-ethyl ester-d$_{14}$ | Antagonist | E$_{2}$ | 5 mg • 10 mg • 25 mg • 50 mg

*Also Available: Palmitic Acid-d$_{14}$ (100045) Palmitic Acid ethyl ester (100046)
For Laboratory Use Only. Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com.
Adipogenesis Assay Kit 1000690B

Stability: ≥1 year at -20°C.

Summary: Cayman’s Adipogenesis Assay provides the reagents required for studying the induction and inhibition of adipogenesis in the established 3T3-L1 model. This kit can also be used to screen drug candidates involved in adipogenesis. Oil Red O staining for lipid droplets is used in this kit as an indicator of the degree of adipogenesis, and can be quantified with a plate reader after the dye is conveniently extracted from the lipid droplet.

Adiponectin (human) EIA Kit (HS)† 10007619

Specificity: Adiponectin, also known as Apn/AdipoQ and GPB-28, is a physiological activator protein which is both hormonally and locally expressed from adipose cells. Adiponectin-expressed levels of adiponectin are inversely related to the degree of obesity and are correlated with insulin resistant states such as those found in obesity and type II diabetes mellitus. Adiponectin increases insulin sensitivity and decreases plasma glucose by increasing fat oxidation. The assay kits listed below are sensitive methods for the quantification of adiponectin from human or mouse samples.

For Laboratory Use Only. Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com. For current European or other overseas pricing, see caymaneurope.com or contact your local distributor.
Angiopoietin-like protein 3 (human) EIA Kit 580190

Stability: 28 months at 4°C
Limit of detection: 0.1 ng/ml
Summary: ANGPTL3 is an immunomodulatory protein that regulates cholesterol metabolism and is involved in the pathogenesis of various diseases. This EIA is based on a double-antibody sandwich technique which utilizes an anti-ANGPTL3 capture antibody and a HRP-conjugated secondary antibody for detection.

For a full specificity profile, please go to www.caymanchem.com

Cholesterol Uptake Cell-Based Detection Assay Kit 10009779

Stability: 28 months at -20°C
Summary: The mechanism for the movement of cholesterol from intracellular sites to the extracellular microenvironment is of fundamental importance to cell biology and medicine. Cayman’s Cholesterol Cell-Based Detection Assay provides a simple fluorometric method to measure cholesterol uptake by cultured cells.

For a full specificity profile, please go to www.caymanchem.com

ChREBP Transcription Factor Assay Kit 10006909

Stability: 28 months at -80°C
Summary: ChREBP is a transcription factor playing a critical role in the regulation of cholesterol metabolism. This EIA is a non-radioactive, sensitive method for detecting specific transcription factor DNA binding activity in nuclear extracts and whole cell lysates in a 96-well plate format.

Accumulation of cholesterol in HepG2 cells. Panel A: Cells grown in culture medium containing 10% FBS and treated with vehicle. There is minimal NBD Cholesterol uptake in these cells. Panel B: Cells grown in medium containing 10% FBS and treated with 1.25 µM U-18666A. There is increased NBD Cholesterol uptake in these cells. Panel C: Cells grown in culture medium containing no FBS and treated with 1.25 µM U-18666A. There is minimal NBD Cholesterol uptake in these cells. Note that there is an increase in intracellular cholesterol in these cells. Panel D: Cells grown in culture medium containing 10% FBS and treated with vehicle. There is minimal NBD Cholesterol uptake in these cells. Panel E: Cells grown in culture medium containing no FBS and treated with vehicle. There is increased NBD Cholesterol uptake in these cells. Panel F: Cells grown in culture medium containing no FBS and treated with 1.25 µM U-18666A. There is increased NBD Cholesterol uptake in these cells. The identification of ChREBP activators is of great interest for drug discovery. The distinct transcription of the protein from the cryptophytes to the nuducida during activation makes it possible to study modulators of ChREBP through subcellular localization of the protein using conventional immunocytochemical staining with a specific antibody. Cayman’s ChREBP Cell-Based Translocation Assay provides a highly specific ChREBP primary antibody together with a Dylight™ (product of Thermo Scientific, Inc) conjugated secondary antibody in a ready to use format.

Translocation of ChREBP into nuclei induced by sucrose. Panel A: HepG2 cells treated with 2.5 µM U-18666A, show that when intracellular transportation of cholesterol was blocked, there was a dramatic increase in nuclear staining.

The mechanism for the movement of cholesterol from intracellular sites to the extracellular microenvironment is of fundamental importance to cell biology and medicine. Cayman’s Cholesterol Cell-Based Detection Assay provides a simple fluorometric method to measure cholesterol uptake by cultured cells.
Sirtuins are a family of nicotinamide adenine dinucleotide (NAD⁺)-dependent deacetylases, which play crucial roles in metabolic regulation and aging. They are a subfamily of the sirtuin family, which includes seven proteins (SIRT1–SIRT7), each with distinct enzymatic properties and targets.

### Sirtuin Localization and Function

<table>
<thead>
<tr>
<th>Sirtuin</th>
<th>Class</th>
<th>Localization</th>
<th>Activity</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIRT1</td>
<td>Nucleus</td>
<td>Cytoplasm</td>
<td>Deacetylase</td>
<td>PGC1α, PFK, PGAA, SIRT1, and more</td>
</tr>
<tr>
<td>SIRT2</td>
<td>Cytoplasm</td>
<td>Deacetylase</td>
<td>Peptidase</td>
<td>FOXO1, PAR3</td>
</tr>
<tr>
<td>SIRT3</td>
<td>Mitochondria</td>
<td>Deacetylase</td>
<td>LCAD, HMGCoA, G3PDH, components of mitochondrial respiration, and more</td>
<td></td>
</tr>
<tr>
<td>SIRT4</td>
<td>Mitochondria</td>
<td>ADP-ribosylation</td>
<td>GPDH</td>
<td></td>
</tr>
<tr>
<td>SIRT5</td>
<td>Mitochondria</td>
<td>Deacetylase, demethylase, and deacetylation</td>
<td>CPI</td>
<td></td>
</tr>
<tr>
<td>SIRT6</td>
<td>Nucleus</td>
<td>Deacetylase</td>
<td>IDH via Histone H3K9 and H3K9</td>
<td></td>
</tr>
<tr>
<td>SIRT7</td>
<td>Nucleus</td>
<td>Not known</td>
<td>Not known</td>
<td></td>
</tr>
</tbody>
</table>

Sirtuins play a role in the regulation of cell metabolism, growth, and aging. They act by deacetylating and activating various proteins, which are involved in the regulation of metabolism, stress response, and cell growth. This results in the activation of downstream pathways that control mitochondrial gene expression and function.

### Sirtuin Function

- **SIRT1** is a class II sirtuin that deacetylates and activates PGC-1α, a master regulator of mitochondrial biogenesis and function.
- **SIRT2** is a class III sirtuin that deacetylases and activates FOXO1, which is involved in adipogenesis.
- **SIRT3** is a class III sirtuin that deacetylases and activates SIRT1, which is involved in the regulation of fatty acid oxidation.
- **SIRT4** is a class III sirtuin that deacetylases and activates SIRT3, which is involved in the regulation of fatty acid oxidation.
- **SIRT5** is a class III sirtuin that deacetylases and activates SIRT6, which is involved in the regulation of fatty acid oxidation.
- **SIRT6** is a class III sirtuin that deacetylases and activates SIRT7, which is involved in the regulation of fatty acid oxidation.
- **SIRT7** is a class III sirtuin that deacetylases and activates SIRT8, which is involved in the regulation of fatty acid oxidation.

### References


### Conclusion

In general, sirtuins become active in nutrient-replete environments, promoting metabolic adaptations aimed at improving metabolic efficiency by utilizing available energy sources. Working towards understanding the unique activities of each sirtuin member and their upstream activation should prove useful in managing metabolic and aging-related diseases. Cayman Chemical offers a complete set of highly pure, recombinant sirtuin proteins and several convenient fluorescence-based assay kits for screening inhibitors or activators of SIRT1, SIRT2, SIRT3, or SIRT4 (see pages 505 and 507). We also offer a cell-based colorimetric assay for measuring intracellular NAD⁺/NADH in culture cells (Item No. 600480). Finally, sirtuin activators such as resveratrol (Item No. 10004235) and sirtuin (Item No. 100523) are also available.
Cortisol
Cortisol is a glucocorticoid produced by the adrenal cortex in response to adrenocorticotropic hormone (ACTH). It is secreted with a circadian periodicity, and peaks just prior to waking in the morning. Cortisol is often elevated in major depressive disorders, certain forms of hyperestrogenism, stress, and AIDS. In serum, approximately 90-95% of cortisol is bound to proteins. Urinary cortisol is not bound to proteins, but its levels are dependent on glomerular filtration and tubular function. In saliva, approximately 67% of cortisol is unbound. There is generally good correlation between cortisol measurements in saliva and serum.

Cortisol EIA Kit
Stability: 1 year at -20°C
Sensitivity: 50% B/B0: 400 pg/ml; 80% B/B0: 110 pg/ml
Summary: Cayman's Cortisol EIA Kit is a competitive assay that can be used for quantification of cortisol in urine, plasma, and other sample matrices.
Specificity: For a full specificity profile, please go to www.caymanchem.com

Coenzyme A Assay Kit
CoA
Stability: 16 months at -20°C
Summary: Coenzyme A (CoA) is an indispensable cofactor in all living organisms, functioning as an acyl group carrier and carboxylating reagent in a number of key biochemical reactions, including the TCA cycle and fatty acid metabolism. CoA is involved in over 100 different reactions in intermediary metabolism with approximately 4% of known enzymes utilizing CoA as a cofactor. Cayman's Coenzyme A Assay Kit can be used for assaying coenzyme A from plasma, serum, tissue, cell lysates, and tissue homogenates. In this assay, CoA forms a fluorescent complex with europium chloride and tetracycline in the presence of periodic acid.

Cortisol Express EIA Kit
Stability: 1 year at -20°C
Sensitivity: 5% B/B0: 400 pg/ml; 80% B/B0: 110 pg/ml
Summary: Cayman's Cortisol Express EIA is a competitive assay that permits the rapid measurement of cortisol from biological samples, requiring only two hours incubation and one hour development time. This EIA offers the convenience of a fast assay while maintaining sensitivity.
Specificity: Refer to Cortisol EIA Kit (Item No. 500360)

CTRP3 (human) EIA Kit
Stability: 16 months at 4°C
Limit of detection: 10 ng/ml
Summary: CTRP3 is a member of the C1q/tumor necrosis factor-related protein 5 superfamily. Mutations in this gene are associated with late-onset retinal degeneration. CTRP3 is also abundantly expressed in adipose tissue and circulates in the blood. It is secreted as a glycoprotein, initially forming trimers then higher order oligomeric complexes. Extracellular, recombinant CTRP3 is a potent activator of AMPK leading to increased cell surface recruitment of GLUT4 and increased glucose uptake. Serum CTRP3 levels are significantly elevated in obese or diabetic mice. Cayman's CTRP3 (Human) EIA Kit is a competitive assay which can be used to measure CTRP3 in human serum or plasma.
Specificity: For a full specificity profile, please go to www.caymanchem.com

DPP (IV) Inhibitor Screening Assay Kit
Stability: ≥1 year at -80°C
Summary: DPP (IV) inhibitors have emerged as a new class of oral antidiabetic agents. These inhibitors promote glucose homeostasis by inhibiting degradation of glucose-dependent insulinotropic polypeptide and glucagon-like peptide-1 (GLP-1) by DPP (IV). GLP-1 extends the action of insulin while suppressing the release of glucagon. Cayman's DPP (IV) Inhibitor Screening Assay provides a convenient fluorescence-based method for screening DPP (IV) inhibitors in a 96-well format.

FABP4 (human) EIA Kit
Stability: 16 months at 4°C
Limit of detection: 0.1 ng/ml
Summary: FABP4 is a 15 kDa member of the intracellular FABP family, which is known for the ability to bind fatty acids and related compounds ( bile acids or retinoids). FABP4 is expressed in a differentiation-dependent fashion in adipocytes and is a critical gene in the regulation of the biological function of these cells. This EIA uses a planar coated with a goat polyclonal antibody against human FABP4. Detection of bound FABP4 is achieved with biotin-labeled anti-human FABP4 polyclonal and streptavidin-HRP.
Specificity: For a full specificity profile, please go to www.caymanchem.com

FABP4 Inhibitor/Ligand Screening Assay Kit
Stability: ≥1 year at -80°C
Summary: Cayman's FABP4 (Human) Ligand Binding Assay provides a sensitive method for the identification of FABP4 ligands. The assay uses an affinity based reagent that exhibits increased fluorescence when bound to FABP4. Any strong ligand and/or inhibitor of FABP4 will displace the fluorescence thereby reducing the fluorescence.

For Laboratory Use Only. Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com.

For current European or other overseas pricing, see caymaneurope.com or contact your local distributor.
Fructose Fluorometric Assay Kit 700690

Stability: ≥6 months at -20°C

Summary: Fructose is a dietary monosaccharide directly absorbed into the bloodstream during digestion. Excess fructose consumption leads to various complications related to metabolic syndrome as well as contributes to the development of non-alcoholic fatty liver disease. Cayman’s Fructose Fluorometric Assay provides a fluorescence-based method for detecting fructose in plasma, serum, urine, tissue homogenates, and cell lysates.

96 wells

Ghrelin

Ghrelin, an endogenous ligand for the growth hormone secretagogue receptor, is synthesized principally in the stomach. It stimulates food intake and transmits signals to the hypothalamic regulatory nuclei that control energy homeostasis. The peptide consists of 28 amino acids with an octanoylation site at the serine-3 residue. Ghrelin is present in the peripheral circulation in acylated (octanoylated) and non-acylated forms in which the acylated form is biologically active. All of the kits below are based on a fluorimetric-enzyme sandwich technique designed to measure either the acylated or non-acylated forms of the peptide.

Ghrelin (human acylated) EIA Kit† 10006306

Stability: ≥6 months at -20°C

Limit of Detection: 1 pg/ml after 3 hour immunological incubation

Summary: This EIA kit specifically measures the acylated form of ghrelin.

Specificity:
- Ghrelin (human) 100%
- Ghrelin (rat) 118%

For a full specificity profile, please go to www.caymanchem.com

96 wells

Ghrelin (rat acylated) EIA Kit† 10006307

Stability: ≥6 months at -20°C

Limit of Detection: 0.25 pg/ml after 20 hour immunological incubation

Summary: This EIA kit specifically measures the acylated form of ghrelin.

Specificity:
- Ghrelin (human) 82%
- Ghrelin (rat) 100%

For a full specificity profile, please go to www.caymanchem.com

96 wells

Free Fatty Acid Assay Kit 700310

Stability: ≥6 months at -20°C

Summary: Free Fatty Acid (FFA) is a marker of intracellular lipid stores. FFA release is associated with metabolic, endocrine, and cardiovascular diseases. The measurement of FFA can be useful in determining metabolic status.

Cayman’s FFA Assay can be used for measuring free fatty acids 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

G6PDH

G6PDH is a cytosolic enzyme that catalyzes the first step in the pentose phosphate pathway. G6PDH deficiency, the most common enzyme deficiency worldwide, causes a spectrum of diseases including neonatal hyperbilirubinemia, acute hemolytic anemia, and chronic hemolysis. G6PDH activity has been shown to be upregulated in rat and mouse models of obesity, hyperglycemia, and hyperinsulinism. Cayman’s G6PDH Assay provides a fluorometric-based method for detecting G6PDH activity in a variety of samples including erythrocyte lysates, tissue homogenates, and cell culture samples.

Glucose-6-Phosphate Dehydrogenase Activity Assay Kit 700300

Stability: ≥6 months at -20°C

Summary: G6PDH is a cytosolic enzyme that catalyzes the first step in the pentose phosphate pathway. G6PDH deficiency, the most common enzyme deficiency worldwide, causes a spectrum of diseases including neonatal hyperbilirubinemia, acute hemolytic anemia, and chronic hemolysis. G6PDH activity has been shown to be upregulated in rat and mouse models of obesity, hyperglycemia, and hyperinsulinism. Cayman’s G6PDH Assay provides a fluorometric-based method for detecting G6PDH activity in a variety of samples including erythrocyte lysates, tissue homogenates, and cell culture samples.

96 wells

For Laboratory Use Only. Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com.

For current European or other overseas pricing, see caymaneurope.com or contact your local distributor.
**Glyceral Fluorometric Assay Kit**

**Kit Code:** 700720

**Stability:** 1 year at -20°C

**Limit of Detection:** 0.2 mg/L (±0.05 mg/L)

**Summary:** 
Glyceral, the backbone of triglycerides, is an important metabolite in energy metabolism involved in both oxidation and synthesis processes. This measurement of circulating levels of glyceral and free fatty acids is considered to reflect lipolysis, and may be useful to evaluate lipolysis under various conditions in clinical studies. Cayman’s Fluorometric Glycerol Assay Kit provides a fluorometric-based method for detecting glyceral in plasma and serum. The Fluorometric Glycerol Assay measures glyceral by a coupled enzymatic reaction system resulting in production of the fluorescent product of norefrulin.

96 wells

**Limit of Detection:** 0.2 mg/L (±0.05 mg/L)

**Sensitivity:** 0.5 mg/L

**R²:** 0.9969

**y-intercept:** 0.0027

**β-Hydroxybutyrate (Ketone Body) Assay Kit**

**Kit Code:** 700190

**Stability:** 1 year at -20°C

**Summary:** 
β-HB, the ketone body which is produced in the liver, mainly from the oxidation of fatty acids, and is exported to peripheral tissues for use as an energy source. Normally ketosis can indicate that lipid metabolism has been activated and the pathway of lipid degradation is intact. Cayman’s β-HB (Ketone Body) Assay provides an accurate method for measuring β-HB levels in plasma, serum, or urine in a 96-well plate format with a fluorometric readout at 445-455 nm.

96 wells

**Limit of Detection:** 0.2 mg/L (±0.05 mg/L)

**Sensitivity:** 0.5 mg/L

**R²:** 0.9987

**y-intercept:** 0.0027

---

**For Laboratory Use Only. Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com. For current European or other overseas pricing, see caymaneurope.com or contact your local distributor.
Leptin

Leptin is a 16 kDa protein hormone encoded by the obese (ob) gene with important effects in metabolism and regulation of body weight. Leptin has dual actions, decreasing appetite and increasing energy consumption. The primary effect of leptin appears to be mediated by leptin receptors expressed mainly in the hypothalamus. Mutations in the ob gene or leptin receptor genes cause hyperphagia, reduced energy expenditure, and severe obesity. The assays listed below are based on a double-antibody sandwich technique for sensitive measurement of leptin or leptin receptor.

Leptin (human) BIA Kit†

STABILITY: 12 months at -20°C

SUMMARY: This assay utilizes plates coated with a monoclonal capture antibody specific for the human leptin receptor and a HRP-conjugated monoclonal antibody for detection.

SPECIFICITY: For a full specificity profile, please go to www.caymanchem.com

96 wells

Lipid Droplets Fluorescence Assay Kit

STABILITY: 12 months at -20°C

SUMMARY: Lipid droplets are a fundamental component of intracellular lipid homestasis 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 droplets.

480 tests

Lipid Uptake Cell-Based Assay Kit

STABILITY: 26 months at 4°C

SUMMARY: LDL uptake and its regulation are important therapeutic targets for atherosclerosis and related diseases. Cayman Chemical’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.

96 wells

Leptin Receptor (human) BIA Kit†

STABILITY: 12 months at 4°C, Limit of Detection: 0.5 ng/ml

SUMMARY: This assay utilizes plates coated with a monoclonal capture antibody specific for the human leptin receptor and a HRP-conjugated monoclonal antibody for detection.

SPECIFICITY: For a full specificity profile, please go to www.caymanchem.com

96 wells

Melanocortin-3 Receptor STEP Reporter Assay Kit (Luminescence)

STABILITY: 1 year at -20°C

SUMMARY: MC3R has important roles in weight regulation, sexual function, and inflammation. Mice deficient in MC3R have increased fat mass and reduced lean mass. Therefore, agonists that selectively activate MC3R might have beneficial effects related to weight gain and glucose metabolism. This assay consists of a 96-well plate coated with both MC3R and SEAP reporter constructs. Cells grown on the STEP complex will express MC3R at the cell surface. Binding of agonists to MC3R initiates a signaling cascade resulting in expression of SEAP. SEAP activity is measured following addition of a luminescence-based alkaline phosphatase substrate provided in the kit.

100 tests

Melanocortin-4 Receptor STEP Reporter Assay Kit (Luminescence)

STABILITY: 1 year at -20°C

SUMMARY: MC4R is important roles in weight regulation, sexual function, and inflammation. Mice deficient in MC4R have increased fat deposition associated with deranged adiposity, while mutations in MC4R in humans are associated with early onset or severe obesity. This assay consists of a 96-well plate coated with both MC4R and SEAP reporter constructs. Cells grown on the STEP complex will express MC4R at the cell surface. Binding of agonists to MC4R initiates a signaling cascade resulting in expression of SEAP. SEAP activity is measured following addition of a luminescence-based alkaline phosphatase substrate provided in the kit.

100 tests
When peroxisomes were first studied, in the 1960s, as a subcellular organelle similar in structure to lysosomes, they were found to consume oxygen to initiate the metabolism of long chain fatty acids through β-oxidation. Additionally, peroxisomes use molecular oxygen to enzymatically produce hydrogen peroxide, which, with peroxidase, is used to oxidize a variety of substrates, including alcohols and toxic compounds. Excess hydrogen peroxide is decomposed by peroxisomal catalase. While peroxisomes may be imported from the cytoplasm directly into peroxisomes,1 they are also found in many cells and tissues, they are particularly important in the liver and kidney.

Peroxisomes can multiply prior to cell division, doubling in number so that mother and daughter cells have a full complement.2 More relevant to this article, peroxisomes can form de novo while a cell is in division. Specific peroxisomal membrane proteins are synthesized in the endoplasmic reticulum (ER), with pre-peroxisomes budding off from the ER to form immature organelles. These may fuse with each other or with mature peroxisomes, while enlarged mature peroxisomes may undergo division to generate smaller peroxisomes. Lysosomal (lysosomes) proteins and additional membrane proteins are imported into the cytoplasm directly into peroxisomes.3 As peroxisome proliferation can coincide with mitosis and exosome cell division is a hallmark of cancer, there was early interest that compounds that promoted peroxisome multiplication might be associated with cancer.4,5

In the 1970s, it was known that clofibrate, a compound with lipid-lowering properties, is a hallmark of cancer, there was early interest that compounds that promoted peroxisomal proliferation might act as carcinogens.5,6 Later called a proliferator, the compound is now known to cause enlargement of the liver (hepatomegaly) in rats that is associated with an increase in the number of peroxisomes.7 While these results were found in vivo, they suggested that peroxisomal proliferation might be a normal feature of liver cells.

One of the most interesting features of peroxisomes is that they are able to synthesize long chain fatty acids from acetyl-CoA and glycerol.8 This is in contrast to most other metabolic pathways that require the supply of fatty acids from the diet or from other organelles.9 Moreover, the presence of peroxisomes in cells and tissues is particularly important in the liver and kidney.10

In the absence of ligand, the PPARα-RXR complex dimerizes and this can occur in either the cytoplasm or nucleus. For example, PPARα binds directly to Jun and p65,11 proteins which, like PPARα, heterodimerize with other proteins to form functional transcription factors. These interactions prevent each transcription factor from acting. For example, PPARα binding to p65 prevents NF-κB-mediated expression of such as NOS, COX-2, and IL-6, thus diminishing pro-inflammatory signaling. PPARα also forms DNA-binding heterodimers with other nuclear receptors, such as thyroid hormone receptor (TR) and liver X receptor (LXR), to alter gene expression. Notably, RXRα can also partner with nuclear receptors, including TR and vitamin D receptors. This competitively prevents signaling through PPARα.

Additional information is available in recent reviews.12-14 Evidence suggests that PPARα can act in other ways. PPARα can directly interact with numerous proteins other than RXRα and this can occur in either the cytoplasm or nucleus. For example, PPARα binds directly to Jun and p65,15 proteins which, like PPARα, heterodimerize with other proteins to form functional transcription factors. These interactions prevent each transcription factor from acting. For example, PPARα binding to p65 prevents NF-κB-mediated expression of such as NOS, COX-2, and IL-6, thus diminishing pro-inflammatory signaling. PPARα also forms DNA-binding heterodimers with other nuclear receptors, such as thyroid hormone receptor (TR) and liver X receptor (LXR), to alter gene expression. Notably, RXRα can also partner with nuclear receptors, including TR and vitamin D receptors. This competitively prevents signaling through PPARα.

### References

Nampt

Nampt is the rate-limiting enzyme in the salvage pathway for the biosynthesis of NAD⁺ from nicotinamide. Nampt was first described as a pro-B-cell colony enhancing factor. It was later named visfatin, as it was found to be highly enriched in visceral fat, with plasma levels increasing with obesity. The levels of Nampt in serum correlate with body mass index and body fat mass, are increased during inflammation, and are decreased with liver cirrhosis. Extracellular Nampt regulates insulin secretion in β-cells by regulating systemic NAD⁺ biosynthesis. Nampt levels and expression in serum, circulating leukocytes, and tissues may be useful biomarkers for inflammation, cancer, obesity, and other diseases.

Nampt/Visfatin (human) EIA Kit 579020

Nicotinamide Phosphoribosyltransferase/Visfatin Stabilility: ≥6 months at 4°C
Limit of detection: 0.5 pg/ml
Summary: Cayman’s Nampt/Visfatin (human) EIA Kit is an immunometric assay which can be used to measure Nampt/Visfatin in mouse or rat serum.
Specificity: Visfatin (human)
96 wells

Nampt/Visfatin (intracellular; human) EIA Kit 579030

Nicotinamide Phosphoribosyltransferase/Visfatin Stabilility: ≥6 months at 4°C
Limit of detection: 0.5 pg/ml
Summary: Cayman’s Nampt/Visfatin (intracellular; human) EIA Kit is an immunometric assay which can be used to measure Nampt/Visfatin in mouse or rat cell lysates.
Specificity: Visfatin (human)
96 wells

NAD+/NADH Cell-Based Assay Kit 600480

Nicotinamide adenine dinucleotide/Nicotinamide adenine dinucleotide, reduced Stabilility: ≥6 months at -80°C
Summary: Oxidation of reduced NADH in culture cells. In the assay, alcohol dehydrogenase catalyzes the oxidation of alcohol to acetaldehyde, in which the formed NADH reduces a tetramethyl blue substrate to a highly-colored formazan which absorbs strongly at 450 nm. The amount of formazan produced is proportional to the amount of NADH in the cell lysate and can be used as an indicator of the cellular NAD⁺ concentration.

100 tests

PPAR Transcription Factor Assays

PPARs are ligand-activated transcription factors belonging to the large superfamily of nuclear receptors. PPARs primarily activate genes encoding proteins involved in fatty acid oxidation, while PPARy primarily activates genes directly involved in lipogenic pathway and insulin signaling. Members of the PPAR family are important direct targets of many antiobesity and hypolipidemic drugs. Cayman’s PPAR Transcription Factor Assays are non-radioactive, sensitive methods for detecting specific transcription factor DNA binding activity in nuclear extracts and whole cell lysates.

For Laboratory Use Only. Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com. For current European or other overseas pricing, see caymaneurope.com or contact your local distributor.
Progranulin (PPARγ) is an autocrine growth factor that plays a role in endocrine development, tissue repair, tumorigenesis, and inflammation. Recently, PGRN has been shown to bind directly to tumor necrosis factor receptors when it antagonizes TNF in signaling, effectively blocking the pathogens of inflammatory arthritis in mice. Furthermore, elevated serum concentrations of PGRN are associated with reduced obesity, decreed plasma glucose, and dyslipidemia. In the central nervous system, PGRN is thought to be involved in neurotrophic activity and neuroinflammation.

**Progranulin (human) EIA Kit**

**Stability:** 24 months at 4°C
**Limit of detection:** 32 pg/ml
**Summary:** Cayman’s Progranulin (human) EIA Kit is an immunometric assay which can be used to measure progranulin in human serum, plasma, or cell culture supernatants.

**Specificity:** Progranulin (human)

**Progranulin (mouse) EIA Kit**

**Stability:** 24 months at 4°C
**Limit of detection:** 60 pg/ml
**Summary:** Cayman’s Progranulin (mouse) EIA Kit is an immunometric assay which can be used to measure progranulin in mouse serum or cell culture supernatants.

**Specificity:** Progranulin (mouse)

**Resistin**

Resistin is a peptide hormone belonging to the class of cysteine-rich secreted proteins termed the RELM family, and is also described as adipose tissue-specific secretory factor (ADSF) and Found in Inflammatory Zone (FIZZ3). Resistin impairs glucose tolerance and insulin action in mice and also inhibits allprogenitor of mouse fetal liver (AML-1) cell. Therefore, resistin has been proposed as an adipocyte secreted factor linking obesity and type 2 diabetes.

**Resistin (human) EIA Kit**

**Stability:** 24 months at 4°C
**Limit of detection:** 0.1 ng/ml
**Summary:** This EIA is based on a double-antibody sandwich technique for quantification of human resistin.

**Specificity:** For a full specificity profile, please go to www.caymanchem.com

**Resistin (rat) EIA Kit**

**Stability:** 24 months at 4°C
**Limit of detection:** 0.05 pg/ml
**Summary:** This EIA is based on a double-antibody sandwich technique for quantification of rat resistin.

**Specificity:** For a full specificity profile, please go to www.caymanchem.com

**Retinol Binding Protein 4 (human) Competitive EIA Kit**

**Stability:** 24 months at 4°C
**Limit of detection:** 2.3 ng/ml
**Summary:** Retinol binding protein (RBP) 4 is a vitamin A transport protein that acts as an adipokine when secreted from adipose tissue. Increased circulating RBP4 levels have been reported in several metabolic complications such as obesity, insulin resistance, metabolic syndrome, and cardiovascular disease. Increased expression of RBP4 positively correlates with increases in pro-inflammatory cytokines and LDL cholesterol in diet-induced obese and hyperlipidemic mice. Reduction of RBP4 has been shown to improve insulin resistance and dyslipidemia. This implicates RBP4 in regulating systemic insulin sensitivity and lipid metabolism, making measurement of serum or plasma RBP4 a useful marker to monitor metabolic disorders and to possibly indicate cardiovascular disease risk. Cayman’s RBP4 (human) Competitive EIA Kit can be used to measure RBP4 in human plasma, serum, urine, and cell culture supernatants.

**Specificity:** For a full specificity profile, please go to www.caymanchem.com

**Pyruvate Assay Kit**

**Stability:** 60 months at -20°C
**Summary:** Pyruvate (pyruvic acid) is a key intermediate in cellular metabolic pathways and is derived primarily from glucose via glycolysis. Abnormal blood pyruvate levels are reported in a number of disorders including shock, liver disease, congestive heart failure, diabetes mellitus, vitamin deficiency, and metabolic disorders. Cayman's Pyruvate Assay provides a fluorescence-based method for quantifying pyruvate in biological samples such as serum, plasma, blood, urine, and saliva. It can also be utilized to determine intracellular and extracellular pyruvate concentrations in cell culture samples.

**Stability:** 6 months at 4°C
**Limit of detection:** 0.05 ng/ml
**Summary:** This fluorescence-based assay utilizes a combination of pyruvate dehydrogenase and NADH dehydrogenase to convert pyruvate to lactate, with the formation of NADH measured using fluorometry. Abnormal blood pyruvate levels are reported in a number of disorders including shock, liver disease, congestive heart failure, diabetes mellitus, vitamin deficiency, and metabolic disorders. Cayman's Pyruvate Assay provides a fluorescence-based method for quantifying pyruvate in biological samples such as serum, plasma, blood, urine, and saliva. It can also be utilized to determine intracellular and extracellular pyruvate concentrations in cell culture samples.

**Stability:** 6 months at 4°C
**Limit of detection:** 0.05 ng/ml
**Summary:** This fluorescence-based assay utilizes a combination of pyruvate dehydrogenase and NADH dehydrogenase to convert pyruvate to lactate, with the formation of NADH measured using fluorometry.
Cayman Chemical caymanchem.com

**SREBP-1 Transcription Factor Assay Kit** 10010854

**Stability:** ≥1 year at -20°C

**Summary:** SREBP-1 is a key transcription factor for fatty acid synthesis, such as acetyl-CoA carboxylase, fatty acid synthase, and long chain fatty acid elongase. SREBP-1 has important clinical implications in the treatment of many diseases including obesity, diabetes mellitus, insulin resistance, and non-alcoholic fatty liver disease. Cayman’s SREBP-1 Transcription Factor Assay Kit is a non-radioactive, sensitive method for detecting specific transcription factor DNA binding activity in nuclear extracts and whole cell lysates in a 96-well plate format.

**SREBP-2 Transcription Factor Assay Kit** 10007819

**Stability:** ≥6 months at -80°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 Kit is a non-radioactive, sensitive method for detecting specific transcription factor DNA binding activity in nuclear extracts and whole cell lysates in a 96-well plate format.

**SREBP-2 Cell-Based Translocation Assay Kit** 10009239

**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™ (product of Thermo Scientific, Inc.) conjugated secondary antibody in a ready to use format. Also included as a positive control is a cholesterol trafficking inhibitor, U-18666A.

**Steatosis Colorimetric Assay Kit** 10012643

**Stability:** ≥1 year at -20°C

**Summary:** Steatosis, also known as fatty liver, is a pathological process characterized by abnormal accumulation of lipid within cells. Cayman Chemical’s Steatosis Colorimetric Assay provides a convenient tool for evaluating the steatotic risk of drug candidates. In this assay, Oil Red O is used to stain neutral lipids in hepatocytes. Lipid accumulation is then quantified using a plate reader after the dye is extracted from the lipid droplets. Chloroquine is included in the kit as a positive control.

**Sirtuins**

The sirtuins represent a class of chromatin-associated lysine deacetylases (class III HDACs) that catalyze a reaction coupling histone deacetylation to the formation of nicotinamide and O-acetyl-ADP-ribose. Cayman’s Direct Fluorescent Screening Assay Kits provide a fluorescence-based method for screening SIRT inhibitors or activators. The procedure requires only two easy steps, both performed in the same microplate. In the first step, the substrate is incubated with human recombinant SIRT along with its co-substrate NAD⁺. Deacetylation sensitizes the substrate such that treatment with the developer in the second step releases a fluorescent product.

**SIRT1 Direct Fluorescent Screening Assay Kit** 10010401

**Stability:** ≥1 year at -40°C

**Summary:** A fluorescence-based method for screening SIRT1 inhibitors or activators

**SIRT2 Direct Fluorescent Screening Assay Kit** 700280

**Stability:** ≥1 year at -40°C

**Summary:** A fluorescence-based method for screening SIRT2 inhibitors or activators

**SIRT3 Direct Fluorescent Screening Assay Kit** 10011566

**Stability:** ≥1 year at -40°C

**Summary:** A fluorescence-based method for screening SIRT3 inhibitors or activators

**SIRT4 Direct Fluorescent Screening Assay Kit** 10011567

**Stability:** ≥1 year at -40°C

**Summary:** A fluorescence-based method for screening SIRT4 inhibitors or activators

**SIRT5 Direct Fluorescent Screening Assay Kit** 10011568

**Stability:** ≥1 year at -40°C

**Summary:** A fluorescence-based method for screening SIRT5 inhibitors or activators

**SIRT6 Direct Fluorescent Screening Assay Kit** 700290

**Stability:** ≥1 year at -40°C

**Summary:** A fluorescence-based method for screening SIRT6 inhibitors or activators

**SIRT7 Direct Fluorescent Screening Assay Kit** 700300

**Stability:** ≥1 year at -40°C

**Summary:** A fluorescence-based method for screening SIRT7 inhibitors or activators

**SIRT8 Direct Fluorescent Screening Assay Kit** 700310

**Stability:** ≥1 year at -40°C

**Summary:** A fluorescence-based method for screening SIRT8 inhibitors or activators

**SIRT9 Direct Fluorescent Screening Assay Kit** 700320

**Stability:** ≥1 year at -40°C

**Summary:** A fluorescence-based method for screening SIRT9 inhibitors or activators

For Laboratory Use Only. Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com. For current European or other overseas pricing, see caymaneurope.com or contact your local distributor.
**Summary:**
Cayman’s SIRT1 FRET-based Screening Assay Kit provides a fluorescence-based method for screening SIRT1 inhibitors or activators. The procedure requires human recombinant SIRT1 along with its co-substrate NAD+. Deacetylation of the substrate, which is coupled to the fluorophore and quencher, is incubated with the kit components. The resulting fluorescence is measured using a fluorescence plate reader. The assay is used to quantify SIRT1 activity and can be used for high-throughput screening of compounds that modulate SIRT1 activity.

**Summary:**
Vaspin, designated as visceral adipose tissue-derived serpin A12, is an adipokine with insulin-sensitizing effects. Vaspin mRNA expression is specific for visceral adipose tissue and it is also found circulating in serum. The level of serum vaspin increases with age up to the peak of obesity, body weight, and insulin resistance in OLETF rats, an animal model of diabetic obesity with type 2 diabetes. Treatment with insulin or pioglitazone normalizes serum vaspin concentrations in this model. As such, vaspin may be regarded as a potential biomarker for obesity and impaired insulin sensitivity. Cayman’s Vaspin (human) EIA Kit can be used to measure vaspin in human serum, plasma, or cell culture supernatants.

**Stability:**
- **Storage:** At -4°C: 12 months
- **Limit of Detection:** 0.05 mg/dL
- **Limit of Quantitation:** 0.3 mg/dL
- **Stability:** At least 95% activity for ≥6 months at 4°C
- **Purity:** ≥95%

**Proteins**

### CHREBP DBD (human recombinant)

**IC50:** 19.5 kDa
**Purity:** ≥95%
**Source:** Recombinant N-terminal His-tagged protein expressed in E. coli
**5 µg**
**10 µg**
**25 µg**
**50 µg**
**100 µg**

**Also Available:** CHREBP DBD Western Ready Control (10007433)

### FABP1 (human recombinant)

**IC50:** 18.5 kDa
**Purity:** ≥95%
**Source:** Recombinant N-terminal His-tagged protein expressed in E. coli
**25 µg**
**50 µg**
**100 µg**

### FABP1 (rat recombinant)

**IC50:** 18.5 kDa
**Purity:** ≥95%
**Source:** Recombinant N-terminal His-tagged protein expressed in E. coli
**25 µg**
**50 µg**
**100 µg**

### FABP2 (human recombinant)

**IC50:** 19.5 kDa
**Purity:** ≥95%
**Source:** Recombinant N-terminal His-tagged protein expressed in E. coli
**25 µg**
**50 µg**
**100 µg**

### FABP3 (human recombinant)

**IC50:** 19.5 kDa
**Purity:** ≥95%
**Source:** Recombinant N-terminal His-tagged protein expressed in E. coli
**25 µg**
**50 µg**
**100 µg**

### Glucokinase (human liver recombinant)

**IC50:** 52.8 kDa
**Purity:** ≥95%
**Source:** Recombinant N-terminal His-tagged protein expressed in E. coli
**5 µg**
**10 µg**
**25 µg**

### Glucokinase (human pancreatic recombinant)

**IC50:** 52.8 kDa
**Purity:** ≥95%
**Source:** Recombinant N-terminal His-tagged protein expressed in E. coli
**5 µg**
**10 µg**
**25 µg**

**For Laboratory Use Only. Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com.**
<table>
<thead>
<tr>
<th>Protein Name</th>
<th>Catalog Number</th>
<th>Purity</th>
<th>Molecular Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPARγ (human recombinant)</td>
<td>10011190</td>
<td>≥90%</td>
<td>~60 kDa</td>
</tr>
<tr>
<td>PPARα LBD [human recombinant]</td>
<td>10007815</td>
<td>≥95%</td>
<td>≥80%</td>
</tr>
<tr>
<td>PPARγ FL [human recombinant from E. coli]</td>
<td>10317</td>
<td>≥90%</td>
<td>44.2 kDa</td>
</tr>
<tr>
<td>PPARγ LBD [human recombinant]</td>
<td>10009088</td>
<td>≥90%</td>
<td>34 kDa</td>
</tr>
<tr>
<td>SIRT1 (human recombinant)</td>
<td>10009987</td>
<td>≥90%</td>
<td>54 kDa</td>
</tr>
<tr>
<td>SIRT2 (human recombinant)</td>
<td>10007451</td>
<td>≥90%</td>
<td>31.4 kDa</td>
</tr>
<tr>
<td>SIRT3 (human recombinant)</td>
<td>10007818</td>
<td>≥90%</td>
<td>43.7 kDa</td>
</tr>
<tr>
<td>SIRT4 (human recombinant)</td>
<td>10316</td>
<td>≥90%</td>
<td>49.3 kDa</td>
</tr>
<tr>
<td>SIRT5 (human recombinant)</td>
<td>10011194</td>
<td>≥90%</td>
<td>60.6 kDa</td>
</tr>
<tr>
<td>SIRT6 (human recombinant)</td>
<td>10011191</td>
<td>≥90%</td>
<td>37 kDa</td>
</tr>
</tbody>
</table>

For Laboratory Use Only, Not for human or veterinary diagnostic or therapeutic use. For current US pricing see caymanchem.com. For current European or other overseas pricing, see caymaneurope.com or contact your local distributor.