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Diabetes and Obesity Research

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Rat Glucagon ELISA Kit *wako*

Cat. #297-57101 96 tests

2~10°C

Glucagon is known as a hormone secreted from the pancreas and intestines. This kit aims at measurement of rat Glucagon peptide secreted from pancreatic α-cells by competitive format. Pancreatic Glucagon plays an important role in regulating sugar levels by elevating sugar in the blood, together with insulin.

**[Principle]**

Mixture of biotinylated rat Pancreatic Glucagon and that in the sample or the standard material binds to rabbit antibody specific to rat Pancreatic Glucagon coated on the microplate well surface in competitive fashion. Sequential reaction with HRP-conjugated streptavidin results in a formation of HRP-streptavidin-biotin-antibody complex in the well, which catalyzes hydrogen peroxide, generating color by oxidation of an acceptor substrate.

**Dynamic range:** 50 ~ 10,000 pg/mL

**Cross-reactivity**

Specific to rat, mouse and human pancreatic Glucagon, but not cross-reactive to intestinal Glucagon nor Glucagon-like peptides as GLP-1 and GLP-2.

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Rat GLP-1 ELISA Kit *wako*

Cat. #291-59201 96 tests

2~10°C

Glucagon-like peptide-1 (GLP-1) is an incretin hormone, which is synthesized in intestinal endocrine cells. This peptide is known to increase insulin secretion by glucose stimulation and suppress glucagon secretion. The kit is applicable to measure rat, mouse and human GLP-1.

**[Kit Contents]**

1. Antibody-coated Microtiter Plate 1 plate
   (Anti-Rabbit IgG, Goat)
2. Rat Glucagon Standard 25 ng
3. Biotinylated Rat GLP-1 For 6 mL
4. Anti Rat GLP-1, Rabbit 6 mL
5. HRP-conjugated Streptavidin 200 μL
6. HRP-conjugated Streptavidin Diluent 12 mL
7. Chromogen (OPD Tablet) 2 tablets
8. Chromogen Diluent Solution 26 mL
9. Wash Stock Solution (20 x) 50 mL
10. Buffer A 10 mL
11. Buffer B 15 mL
12. Stop Solution 12 mL
13. Adhesive Plate Cover 3 pieces

**[Standard Curve]**

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Online Catalog: [http://search.wako-chem.com](http://search.wako-chem.com)
Rat C-Peptide ELISA Kit *wako*
Cat. #295-57401 96 tests
2–10°C
Insulin C-Peptide (InsC-Peptide) is derived from proinsulin by processing in vivo, and released into blood in almost equal molarity to insulin. By measurement of InsC-Peptide in the serum, insulin secretion on pancreatic β cells in insulin-administered rats and rats bearing antibody to insulin could be monitored.

**[Principle]**
On the surface of the microplate wells, goat anti rabbit IgG is coated, and when sample is reacted with rabbit anti rat InsC-Peptide and biotinylated rat InsC-Peptide in the well, the goat antibody captures the complex of the rabbit antibody and rat InsC-Peptide formed in competitive reaction. Subsequent reaction with horseradish peroxides (HRP)-conjugated streptavidin to the complex on the well surface results in labeling of the complex with HRP which generates the signal for the presence of rat InsC-Peptide in the sample.

**Dynamic range:** 1.56 ~ 50 ng/mL  
**Cross-reactivity:** Specific to rat InsC-Peptide.
mouse C-Peptide I (30 %); mouse C-Peptide II (3 %).

Rat Leptin ELISA Kit *wako*
Cat. #297-57601 96 tests
2–10°C
Leptin, secreted from fatty cells, is known as a hormone controlling body fat by suppression of eating and increase of energy metabolism. It is reported, however, that expression of leptin gene in fatty tissue and concentration of leptin in blood are at high levels in obese people and model animals of obesity.

**[Principle of the assay]**
This kit is a sandwich-format of ELISA with two antibodies specific to rat leptin. Monoclonal antibody to leptin is coated on the microplate well, which captures leptin in sample. Following reaction with HRP-conjugated rabbit anti rat leptin antibody, forms HRP labeled antigen-antibody complex on the well surface which results in labeling of the complex with HRP which generates the signal for the presence of rat leptin in the sample.

**Dynamic range:**  
- Samples for serum and plasma : 312.5 ~ 20,000 pg/mL  
- Samples for others than serum and plasma : 78.1 ~ 5,000 pg/mL  
**Cross-reactivity:** Specific to rat Leptin, but only slightly cross-reactive to human Leptin.

**Leptin, Mouse, recombinant**  
for Cytobology  
Cat. #121-05041 1 mg
-20°C, Lyophilized

**Source:** Mouse leptin cDNA expressed in E. coli.  
**Form:** Lyophilized (sterilized by filtration)  
**Endotoxin:** < 0.1 ng/μg (1 EL/μg)  
**Molecular Weight:** 16,000  
**Biological Activity:** Leptin, when administered (5μg per gram of body weight) once daily for a period of 14 days to obese mouse models (ob / ob. NZO), was proven to be effective in terms of body weight, metabolism, and blood glucose level.
Aldose Reductase, Human, recombinant / Sorbitol Dehydrogenase

Although much of the blood glucose enters the cells with the help of insulin, there also exists an alternate route of glucose metabolism which does not use insulin: the polyol pathway. With this polyol metabolizing pathway, aldose reductase converts glucose to sorbitol, which in turn is converted to fructose by sorbitol dehydrogenase. The sorbitol accumulates in cells because of its slow metabolism, and increased osmotic pressure in the cells causes fluid to flow into the cells, resulting in swelling of these. This is suggested to be the cause of cellular malfunction. The polyol pathway has been reported to play an important role in the retina, lens, kidney, and peripheral nerves, and these enzymes can be used as a useful tool for further studies of diabetic complications.

In comparison with commercially available enzyme from sheep liver, sorbitol dehydrogenase shows low reactivity with sugar alcohols such as xylitol, mannitol, and inositol, and exhibits a high substrate specificity toward D-sorbitol, which allows for accurate determination of quantity of sorbitol in living body.

For Research of Diabetic Complications

**Aldose Reductase, Human, recombinant**, 95.0+%

**Cat. #547-00581** 0.4 units

-20°C, lyophilized Liquid

**Molecular Weight**: Approx. 36,000

**Appearance**: Dissolved in 5mM DTT, 50% Glycerin solution, and 50mM Na2HPO4 buffer solution (pH 7.0)

**Specific Activity**: 1.5 ± 0.2 units/mg protein

Aldose Reductase catalyzes the reduction of glucose to sorbitol. Sorbitol is subsequently converted to fructose by sorbitol dehydrogenase. These two enzymes are key components of the polyol pathway, the alternate route of glucose metabolism. It is suggested that aldose reductase is involved in the pathogenesis of diabetic complications and the inhibitors continue to be developed at a vigorous pace.


**Sulfuretin**, 95.0+%  

**Cat. #195-12491** 20 mg

2~10°C, Solid

Sulfuretin, characterized by aurones, is an old compound in the flavonoid family. Recently, however, its inhibitory effect on aldose reductase was elucidated. Aldose Reductase Inhibitors inhibit accumulation of sorbitol in tissues and therefore are useful in research on preventing diabetic complications including neuropathy, retinopathy, and nephropathy. This product is a synthetic compound.

**Sulfuretin**

**Cat. #195-12491** 20 mg

2~10°C, Solid

Sulfuretin is a compound used in the flavonoid family. It has an inhibitory effect on aldose reductase, which helps prevent diabetic complications such as neuropathy, retinopathy, and nephropathy. It is a synthetic compound.


**Aldose Reductase Inhibitor**

**AD-5467**

**Cat. #017-19421** 500 mg

2~10°C, Solid

AD-5467 inhibits aldose reductase (IC50 = 51 nmol/L) and platelet aggregation

As sorbitol accumulates excessively in tissues and platelet aggregation is increased in diabetic conditions, AD-5467 is useful in research on preventing and treating diabetic complications.

**For Accurate Quantification of Sorbitol**

**Sorbitol Dehydrogenase (EC 1.1.1.14)**

**Cat. #199-12391** 50 units/vial

-20°C, lyophilized

Sorbitol Dehydrogenase is an essential enzyme involved in polyol metabolism. Sorbitol Dehydrogenase, isolated from microorganisms, is characterized by its high substrate specificity and it degrades D-sorbitol, used as a substrate, into fructose. It is believed that diabetic complications are caused by sorbitol accumulation. The conventional enzymes on the market react with sugars other than sorbitol; however, Sorbitol Dehydrogenase with high substrate specificity enables accurate quantification of sorbitol.

When reacted with typical sugars as substrates including glucose, mannitol, and galactose (at 0.5mol/L concentration) independently or in a mixture, the absorbance did not change, proving high substrate specificity of Sorbitol Dehydrogenase. Sorbitol Dehydrogenase is useful not only in research on aggravation mechanism of complications but also in sorbitol quantification in foods.

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**Flavonoids**

Flavonoids derived from Shekwasha

Nobiletin and tangeretin are polymethoxy flavonoids contained in the juice of Shekwasha, a citrus fruit. These flavonoids are receiving attention for a variety of beneficial effects such as reducing elevation of blood pressure and plasma glucose levels.

**References**


<table>
<thead>
<tr>
<th>Wako Cat. #</th>
<th>Description</th>
<th>Package Size</th>
<th>Physical Data</th>
<th>Solubility</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>149-07521</td>
<td><strong>Nobiletin</strong>, 95.0+% (HPLC)</td>
<td>10 mg</td>
<td>MW : 402.39 (C21H22O8)</td>
<td>Soluble in methanol</td>
<td>-20°C, Solid</td>
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<tr>
<td>208-15671</td>
<td><strong>Tangeretin</strong>, 95.0+% (HPLC)</td>
<td>10 mg</td>
<td>MW : 372.37 (C20H20O7)</td>
<td>Soluble in methanol</td>
<td>-20°C, Solid</td>
</tr>
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**[Related Products] Polyphenols**

**a. Theaflavins, Black Tea Extracts**

<table>
<thead>
<tr>
<th>Wako Cat. #</th>
<th>Description</th>
<th>Package Size</th>
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<th>Condition</th>
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<tr>
<td>201-31161</td>
<td>Theaflavin, 90%</td>
<td>1 mg</td>
<td>Lyophilized</td>
<td>-20°C, DM</td>
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<tr>
<td>202-31191</td>
<td>Theaflavin-3-gallate, 90%</td>
<td>1 mg</td>
<td>Lyophilized</td>
<td>-20°C, DM</td>
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<tr>
<td>204-31271</td>
<td>Theaflavin-3'-gallate, 90%</td>
<td>1 mg</td>
<td>Lyophilized</td>
<td>-20°C, DM</td>
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<tr>
<td>208-31211</td>
<td>Theaflavin-3,3'-digallate, 90%</td>
<td>1 mg</td>
<td>Lyophilized</td>
<td>-20°C, DM</td>
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**b. Catechins, green tea extracts**

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<tr>
<td>059-06751</td>
<td>(-)-Epicatechin, from Green Tea, 98+%</td>
<td>10 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>055-06753</td>
<td>(-)-Epicatechin Gallate, from Green Tea, 98+%</td>
<td>50 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>058-06743</td>
<td>(-)-Epicatechin, from Green Tea, 98+%</td>
<td>10 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>056-06761</td>
<td>(-)-Epigallocatechin, from Green Tea, 98+%</td>
<td>50 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>059-05411</td>
<td>(-)-Epigallocatechin Gallate, 98+%</td>
<td>100 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>032-18231</td>
<td>Catechin Mixture, from Green Tea, 85+%</td>
<td>1 g</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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**c. Isoflavones, Soybean extracts**

<table>
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<td>013-18861</td>
<td>6''-O-Acetyldaidzin, 90+ %</td>
<td>1 mg</td>
<td>Solid</td>
<td>-20°C, DM</td>
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<td>010-18811</td>
<td>6''-O-Acetylgenistin, 90+ %</td>
<td>1 mg</td>
<td>Solid</td>
<td>-20°C, DM</td>
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<td>010-18791</td>
<td>6''-O-Acetylglycitin, 90+ %</td>
<td>1 mg</td>
<td>Solid</td>
<td>-20°C, DM</td>
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<tr>
<td>040-27741</td>
<td>Daidzin, from Soybean, 98+%</td>
<td>10 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>046-27743</td>
<td>Daidzin, from Soybean, 98+%</td>
<td>100 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>043-28071</td>
<td>Daidzein, from Soybean, 98+%</td>
<td>10 mg</td>
<td>Lyophilized</td>
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<td>049-28073</td>
<td>Daidzein, from Soybean, 98+%</td>
<td>100 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<td>077-04891</td>
<td>Glycitin, from Soybean, 98+%</td>
<td>10 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>073-04893</td>
<td>Glycitin, from Soybean, 98+%</td>
<td>100 mg</td>
<td>Lyophilized</td>
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<td>070-04701</td>
<td>Glycitein, from Soybean, 98+%</td>
<td>10 mg</td>
<td>Lyophilized</td>
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<td>076-04853</td>
<td>Glycitein, from Soybean, 98+%</td>
<td>100 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>070-04841</td>
<td>Genistin, from Soybean, 98+%</td>
<td>10 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>076-04843</td>
<td>Genistin, from Soybean, 98+%</td>
<td>100 mg</td>
<td>Lyophilized</td>
<td>2-10°C</td>
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<tr>
<td>546-00171</td>
<td>Genistein, 98+%</td>
<td>20 mg</td>
<td>Lyophilized</td>
<td>-20°C, DM</td>
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<tr>
<td>093-04771</td>
<td>Isoflavone (Alfalfa) Mixture, Crude, from Soybean, 95+</td>
<td>1 g</td>
<td>Lyophilized</td>
<td>-20°C, DM</td>
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<td>132-13821</td>
<td>8''-O-Malonyldaidzin, 90+ %</td>
<td>1 mg</td>
<td>Solid</td>
<td>-20°C, DM</td>
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<td>136-13841</td>
<td>8''-O-Malonylgenistin, 90+ %</td>
<td>1 mg</td>
<td>Solid</td>
<td>-20°C, DM</td>
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<tr>
<td>139-13831</td>
<td>8''-O-Malonylglycitin, 90+ %</td>
<td>1 mg</td>
<td>Solid</td>
<td>-20°C, DM</td>
</tr>
</tbody>
</table>
Betacellulin

Betacellulin\(^2\) is a member of the EGF family, initially isolated from a mouse pancreatic \(\beta\)-cell carcinoma (insulinoma) cell line \(\beta\) TC-3. The mature form of BTC exists as a glycoprotein composed of 80 amino acid residues processed from a 177-residue membrane-bound precursor. Betacellulin induces insulin expression in AR42J rat pancreatic carcinoma cells\(^3,4\) and promotes proliferation of fibroblasts, vascular smooth-muscle cells, and retinal pigment epithelial cells.

**Betacellulin, Human, recombinant\(^2,5\)**

<table>
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<th>Cat.</th>
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<th>10 (\mu)g</th>
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<td>-20(^\circ)C, lyophilized</td>
<td>Appearance: Lyophilized from 100 ng/mL PBS containing 0.1% BSA</td>
<td>Molecular weight: 9.1 k (theoretical value calculated from 80 amino acids)</td>
</tr>
<tr>
<td>Source: Human betacellulin cDNA expressed in (E.\ coli)</td>
<td>Endotoxin: 0.1 ng/(\mu)g or less</td>
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**Betacellulin, Rat, recombinant\(^1\)**

<table>
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<th>Cat.</th>
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<td>-20(^\circ)C, lyophilized</td>
<td>Appearance: Lyophilized from 100 ng/mL PBS containing 0.1% BSA</td>
<td>Molecular weight: 9.2 k (theoretical value calculated from 80 amino acids)</td>
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<td>Source: Rat betacellulin cDNA expressed in (E.\ coli)</td>
<td>Endotoxin: 0.1 ng/(\mu)g or less</td>
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**References**


**For Construction of Diabetes Model**

**Streptozotocin**

*for Biochemistry*

<table>
<thead>
<tr>
<th>Cat.</th>
<th>#549-00281</th>
<th>100 mg</th>
<th>#545-00283</th>
<th>500 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2(^\circ)C, Solid</td>
<td>Appearance: Slightly yellowish powder</td>
<td>Solubility: Soluble in water, ethanol, and acetone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source: Streptomyces achromogenes</td>
<td>Toxicity: Oral LD(_{50}) 264 mg/kg (mouse)</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Online Catalog:** http://search.wako-chem.com
HMG-CoA Reductase Inhibitors

Competitive inhibitors of 3-hydroxy-3-methylglutaryl coenzyme A (HMG-CoA) reductase are the rate limiting enzymes in cholesterol biosynthesis. By blocking the conversion of HMG-CoA to the cholesterol precursor mevalonate, these agents inhibit hepatic synthesis of cholesterol, causing a subsequent stimulation of LDL receptors and an increase in the clearance of LDL and its precursor particles from the circulation.

[Reference]

Resistin, recombinant

Resistin, Human Cat. #187-01801 25 μg
–20°C, D/I, Lyophilized

Resistin, Mouse Cat. #184-01811 25 μg
–20°C, D/I, Lyophilized

Resistin is a dimeric hormone secreted by mast cells and is attracting attention as a substance which impairs insulin action. TNF-α and free fatty acid are known as resistins.

Serum resistin concentration decreases with administration of antidiabetic drugs and is elevated when obesity occurs. It was also found that administration of resistin-neutralizing substance to obese mice restored serum glucose levels and insulin action. Based on these findings, it is believed that resistin is a key link between obesity and diabetes.

Human resistin
Description: freeze dried from 10 mmol/L sodium citrate (pH 3.0). Filtered and sterilized.

[Reference]

Acrp30, globular domain, Mouse, recombinant

Acrp30: substance which improves insulin resistance

Cat. #017-19541 25 μg
–20°C, D/I, Lyophilized

Acrp30 is a mouse homologue of adiponectin. Adiponectin/Acrp30 is a adipocytokine secreted by adipose tissues. Unlike TNF-α or leptin, the serum levels of Acrp30 is known to decrease as obesity increases. It was recently reported that injection of adiponectin to diabetic mice improved insulin resistance. Mouse globular domain is a decomposition product of Acrp30 with molecular weight of 16,000 comprising 145 amino acids.

It is characterized by more potent activity than Acrp30.

Appearance: Lyophilized from the filter sterilized 5 mmol/L Tris (pH 7.6)
Source: Mouse globular domain Acrp30- cDNA expressed in E. coli.
Endotoxin: <0.1 ng/μg (1 EU/μg)
Reconstitution: Dissolve with 5 mmol/L Tris (pH 7.6) to make 0.1~1.0 mg/mL solution.

[Reference]
TMP-153
for Biochemistry

Cat. #207-15641 500 mg
2-10°C, Solid

TMP-153 is an ACAT (acyl-CoA : cholesterol acyltransferase) inhibitor which inhibits cholesterol absorption.\(^1\)\(^,\)\(^2\)

[References]