

Wako Product Update

BIOCHEMISTRY • • • • •

ANALYTICAL CHEMISTRY • • • • •

ORGANIC CHEMISTRY • • • • •

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Mg²⁺-selective Fluoroionophore

KMG-20-AM

Cat. #110-00711 1 mg

#116-00713 5 mg

-20°C, D/I, Solid

Dynamic distribution of Mg²⁺ in living cells can be done due to selective recognition of Mg²⁺ by KMG-20-AM. KMG-20-AM is much less reactive to Ca²⁺ than Mg²⁺.

KMG-20-AM enables accurate measurement of Mg²⁺ because it has very much low affinity to Ca²⁺ compared to Mg²⁺.

Appearance : Brown, powder

Assay (HPLC) : 95+ %

[Features]

1. Mg²⁺-imaging without interference of Ca²⁺
2. Precise observation of Mg²⁺ distribution by Fluorescent Microscopy
3. Direct observation of Mg²⁺ ion dynamics in living cells

Fluorescent imaging

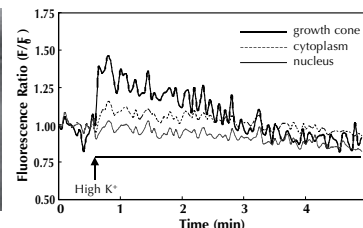
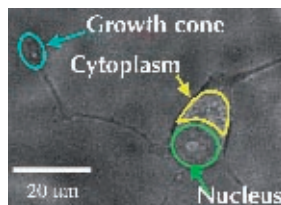
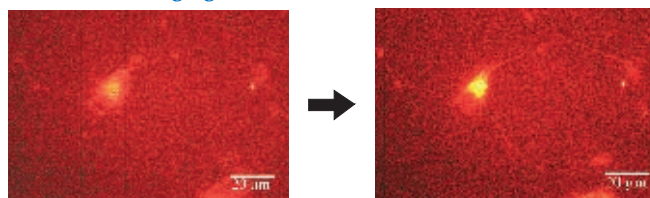


Figure : Dynamics of Mg²⁺ probe (KMG-20-AM) in neuron by addition of K⁺

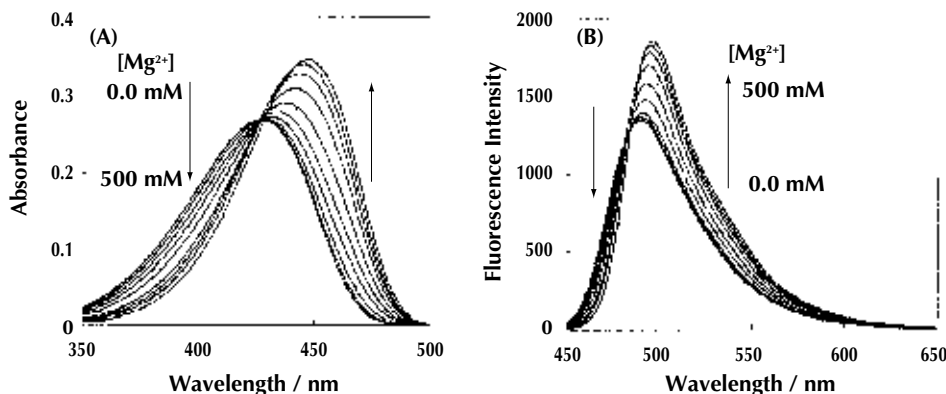


Figure : Absorption spectra (A) and fluorescence spectra (B) of 10.0 μM KMG-20 before and after the addition of MgCl₂ at 37 °C in 10.0 mM HEPES, 120.0 mM KCl, 20.0 mM NaCl (pH 7.2). [MgCl₂]=0, 0.1, 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500 mM. Excitation at 445 nm for the fluorescence measurements.

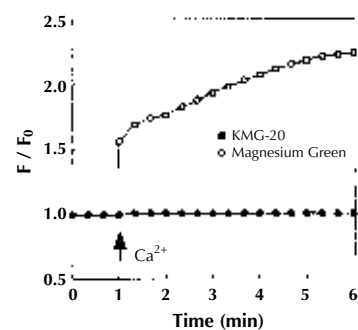
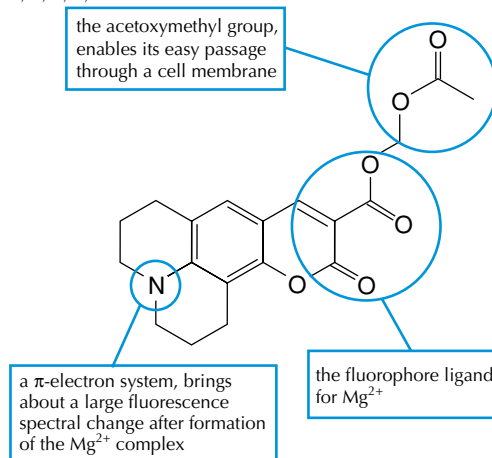


Figure : Responses of fluorescence intensity of KMG-20 and Magnesium Green for Ca²⁺. Arrow indicates the timing of 10 μM CaCl₂ addition ([Ca²⁺] increased from 140 to 850 nM).



[References]

- 1) Nagashima, H., Tohda, K., Matsunari, Y., Tsunakawa, Y., Watanabe, K., Inoue, H. and Suzuki, K.: *Anal. Lett.*, **23**, 1993(1990).
- 2) Suzuki, K., Watanabe, K., Matsumoto, Y., Kobayashi, M., Sato, S., Siswanta, D. and Hisamoto, H.: *Anal. Chem.*, **67**, 324(1995).
- 3) Suzuki, Y., Saito, N., Komatsu, H., Citterio, D., Kitamura, Y., Kubota, T., Oka, K. and Suzuki, K.: *Anal. Sci.*, **17**, 1145(2001).
- 4) Suzuki, Y., Komatsu, H., Ikeda, T., Saito, N., Araki, S., Citterio, D., Hisamoto, H., Kitamura, Y., Kubota, T., Nakagawa, J., Oka, K. and Suzuki, K.: *Anal. Chem.*, **74**, 1423(2002).
- 5) Haugland, R. P.: "Handbook of Fluorescent Probes and Research Products, 7th ed.", Molecular Probes Inc.
- 6) Kubota, T., Tokuno, K., Nakagawa, J., Kitamura, Y., Ogawa, H., Suzuki, Y., Suzuki, K. and Oka, K.: *Biochem. Biophys. Res. Commun.*, **303**, 332(2003).

Resistin, recombinant *Resistin : molecule termed as "Resistin" signifying resistance to insulin***Resistin, Human** Cat. #187-01801 25 µg**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.

	Human resistin	Mouse Resistin
Appearance	Lyophilized from the filter sterilized 10 mol/L sodium citrate (pH 3.0)	Lyophilized from the filter sterilized 20 mmol/L Tris (pH 8.0)
Source	Human resistin cDNA expressed in <i>E. coli</i> .	Source : Mouse resistin cDNA expressed in <i>E. coli</i> .
Molecular Weight	19,500	20,200
Endotoxins	< 0.1 ng/µg (1 EU/µg)	< 0.1 ng/µg (1 EU/µg)

[Reference]1) Steppan, C.M., et al.: Nature, **409**, 307 (2001).**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 adiponectin¹). 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 resistance²).

Mouse globular domain is a decomposition product of Acrp30 with molecular weight of 16,000 comprising 145 amino acids³).

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]1) Maeda, K. et al.: Biochem. Biophys. Res. Commun., **221**, 286 (1996).2) Yamauchi, T. et al.: Nat. Med., **7**, 941 (2001)3) Scherer, P.E., et al.: J. Biol. Chem., **270**, 26746 (1995).**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.

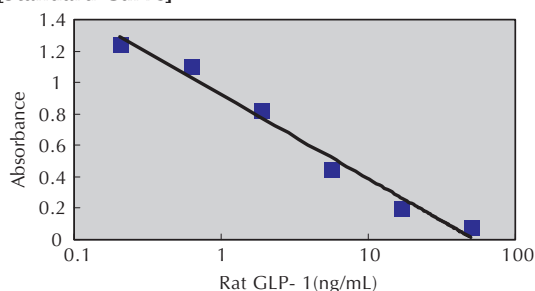
[Kit Contents]

1. Antibody-coated Microtiter Plate (Anti Rabbit IgG, Goat) 1 plate
2. Rat GLP-1 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 ×) 50 mL
10. Buffer 10 mL
11. Stop Solution 12 mL
12. Adhesive Plate Cover 3 pieces

[Features]

1. Sensitivity Dynamic Range : 206 ~ 50,000 pg/mL
2. Reproducibility
 - Intra-assay C.V.(%) = 5.4 ~ 6.6
 - Inter-assay C.V.(%) = 5.5 ~ 18.9
3. Specificity

Applicable to measure rat, mouse and human GLP-1. Little cross-reactivity exists with rat GLP-2, human GLP-2, human glycentin, and human glucagon.
4. Spike recovery: 89 ~ 110 % (Plasma)
5. Sample volume: 30µL

[Standard Curve]**Related Products**

Wako Cat. #	Description	Package Size
297-57101	Rat Glucagon ELISA Kit wako	96 tests
295-57401	Rat C-peptide ELISA Kit wako	96 tests

Trypsin, plant-recombinant free from animal infectants

Trypsin, Bovine, recombinant, expressed in Corn [TrypZean™]

Cat. #208-15931 5 mg
#204-15933 50 mg

-20°C, D/I, Lyophilized

As it is expressed in corn, it does not contain animal diseases such as BSE.

Activity : 172 + TAME units/mg (3,300 + USP units/mg)

Allergy (IgE production) inducing substance

Aluminium Hydroxide Gel

for Immunochemistry

Cat. #019-19501 100 mg

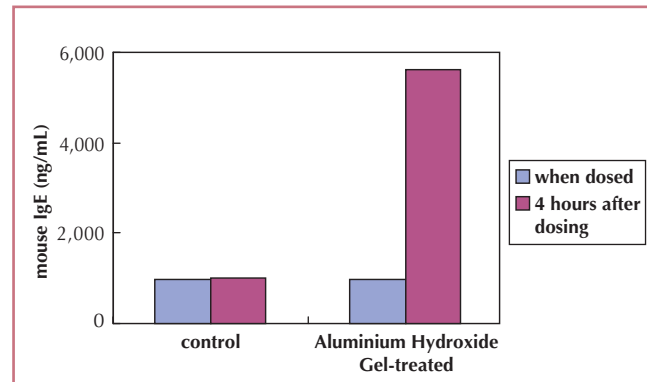
-20°C, D/I, Suspension

Aluminium Hydroxide Gel is also called ALUM and is used as a substance to induce IgE production. This product is tested for IgE production on each lot, therefore the product reliability is ensured.

Concentration : 20 mg/mL

Test on IgE production:

- Method: This product and 50 mg/mL of DNP-BSA of the equivalent amount are administered i.p. to BALB/c mice twice and the serum IgE levels were measured.
- Animal model used: BALB/c mice, 8 week old, male



4. Enzyme Inhibitor

β -galactosidase inhibitor

2-Phenylethyl β -D-Thiogalactoside

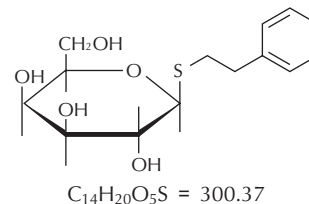
for Biochemistry

Cat. #163-20961 250 mg
#169-20963 1 g

Assay (HPLC) : 98 + %

Water : max. 5 %

Solubility : Soluble in methanol



ALPHABETICAL INDEX

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	4	Anti Iba1 polyclonal antibody, Rabbit, for Western Blotting
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	6	Macrophage Colony Stimulating Factor, Mouse, recombinant
	6	M-CSF
	5	Mildform® 10N, 10NM, 15N, 15NM, 20N and 20NM
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N	6	N-Vanillylamide
	6	N-Vanillylamide
	8	Wakopak® Navi C18-5, C22-5, C30-5

	page	Description
P	6	Parathyroid Hormone Related Protein, Human, recombinant
	5	Pathoprep® 546, 567 and 580
R	9	(R)-(+)-2-Phenoxypropionic Acid
	9	(S)-(-)-2-Phenoxypropionic Acid
	3	2-Phenylethyl β -D-Thiogalactoside
	6	PTHrP
	2	Rat C-peptide ELISA Kit Wako
	2	Rat GLP-1 ELISA Kit Wako
	2	Rat Glucagon ELISA Kit Wako
	2	Resistin, recombinant
	7	Ribosomal RNA Marker (16S + 23S) (1,776; 3,566 b)
	7	Ribosomal RNA Marker (18S + 28S) (2,000; 5,300 b)
S	7	RNA Size Standard Marker (100; 200; 300; 400; 500 b)
	7	RNA Size Standard Marker II (0.5; 1; 1.5; 2; 2.5; 3; 4; 5; 6; 9kb)
	7	RNA Size Standard Marker III (100; 200; 300; 400; 500; 750; 1,000 b)
	7	RNA Size Standard Marker IV (0.28 ~ 6.58 kb)
	10	RuHAP
	10	Ruthenium (III)-Hydroxyapatite
	6	Shh
T	6	Sonic Hedgehog, Human, rec.
	8	SP6 RNA Polymerase, recombinant, Solution
W	9	(2R,3R)-(+)-Tartranilic Acid
	9	(2S,3S)-(-)-Tartranilic Acid
	8	T3 RNA Polymerase, recombinant, Solution
	8	T7 RNA Polymerase, recombinant, Solution
	3	Trypsin, Bovine, recombinant, expressed in Corn
3	TrypZean™	
V	6	N-Vanillylamide
W	8	Wakopak® Navi C18-5, C22-5, C30-5

*Antibodies against Macrophage/Microglia-specific Protein Iba1***Anti Iba1 polyclonal antibodies, Rabbit** (Iba1: ionized calcium binding adapter molecule 1)

Calcium ions are known to be one of the most important signal mediators in all cells including central nervous system (CNS) cells. Calcium ions exert their signaling activity through association with various calcium binding proteins, many of which are classified into a large protein family, the EF hand protein family.

Iba1 is a 17-kDa EF hand protein that is specifically expressed in macrophages/ microglia and is upregulated during the activation of these cells.

Wako has launched rabbit polyclonal antibodies were raised against a synthetic peptide corresponding to the Iba1 carboxy-terminal sequence, which was conserved among human, rat and mouse Iba1 protein sequences. **These antibodies are specifically reactive to microglia/ macrophages, are appropriate for immuno-double staining of brain tissues and cell culture in combination with monoclonal antibody to GFAP, which specifically reacts to astrocyte.**

Specificity :

Specific to microglia and macrophages, but not cross-reactive with neurons and astrocytes.

Reactive with human, mouse and rat Iba1.

Anti Iba1 polyclonal antibody, Rabbit, for Immunocytochemistry

Wako Cat. #019-19741 50 µg (100 µL)

-20 °C, D/I

Working Conc.: Immunocytochemistry 1 - 2 µg/mL

Anti Iba1 polyclonal antibody, Rabbit, for Western Blotting

Wako Cat. #016-20001 50 µg (100 µL)

-20 °C, D/I

Working Conc.: Westernblot 0.5 - 1 µg/mL

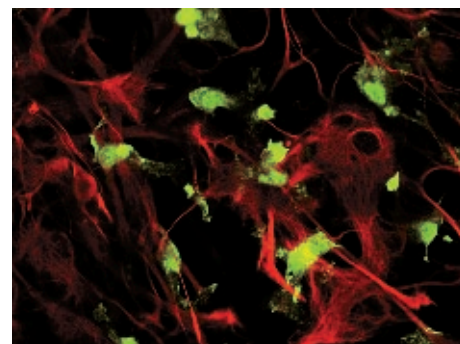


Figure 1

Immuno-double staining of rat primary mixed culture cells
Green: Iba1, which reacts to anti Iba1 antibody (Wako C. #019-19741)

Red: astrocyte, which reacts to anti GFAP, monoclonal antibody

(Data was provided by Dept. of Neurochemistry, National Institute of Neuroscience (Japan).)

[References]

- 1) Imai, Y., Iyata, I., Ito, D., Ohsawa, K. and Kohsaka, S.: *Biochem. Biophys. Res. Commun.*, **224**, 855 (1996).
- 2) Ito, D., Imai, Y., Ohsawa, K., Nakajima, K., Fukuuchi, Y. and Kohsaka, S.: *Brain Res. Mol. Brain Res.*, **57**, 1 (1998).
- 3) Ohsawa, K., Imai, Y., Kanazawa, H., Sasaki, Y. and Kohsaka, S.: *J. Cell Sci.*, **113**, 3073 (2000).
- 4) Sasaki, Y., Ohsawa, K., Kanazawa, H., Kohsaka, S. and Imai, Y.: *Biochem. Biophys. Res. Commun.*, **286**, 292 (2001).
- 5) Kanazawa, H., Ohsawa, K., Sasaki, Y., Kohsaka, S. and Imai, Y.: *J. Biol. Chem.*, **277**, 20026 (2002).

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Wako GmbH homepage



<http://www.wakochemicals.de>

Formalin fixative for pathological tissues, deodorized

Mildform® products

Mildform® products, fixatives for pathological tissues, are neutral buffered formalin solution prepared according to Lillie's formulation to which wine extract* is added. The wine extract minimizes the irritating and unpleasant odor of formalin, however, with regard to operational safety, minimum degree of odor is present so that formalin can be recognized.

*Mechanism of wine extract's effect : The masking effect minimizes the irritating and unpleasant odor of formalin.

[Features]

1. Most suitable for tissue fixation of immunohistochemical staining by an immunoenzymatic technique
2. The fixation and osmosis are equivalent to that of neutral buffered formalin solution or greater.

Description	Mildform®					
	10N**	10NM***	15N	15NM	20N	20NM
Wako catalog No.	133-10311	132-10521	132-14301	139-14311	136-10041	139-10531
Package Size	1 L	1 L	1 L	1 L	1 L	1 L
Concentration of formaldehyde solution	10 %		15 %		20 %	
<Composition>						
Formaldehyde Solution	100 mL	100 mL	150 mL	150 mL	200 mL	200 mL
NaH ₂ PO ₄ · 2H ₂ O	4.5 g	4.5 g	4.5 g	4.5 g	4.5 g	4.5 g
Na ₂ HPO ₄	6.5 g	6.5 g	6.5 g	6.5 g	6.5 g	6.5 g
Methanol	-	100 mL	-	150 mL	-	200 mL
Water	Add water to make the 1 L solution.					
Formaldehyde Content	4 %		6 %		8 %	
pH	7.0 ~ 7.5					

N : signifying neutral. Mildform®s are produced based on neutral buffered formalin.

M : signifying methanol content. Addition of methanol enhances osmosis into and fixation to tissues.

In general, NM-type is most suitable for rapid fixation with minimum length of time needed. Also suitable as a formalin-methanol fixative for fixing samples containing a large amount of connective tissues and adipose tissues.

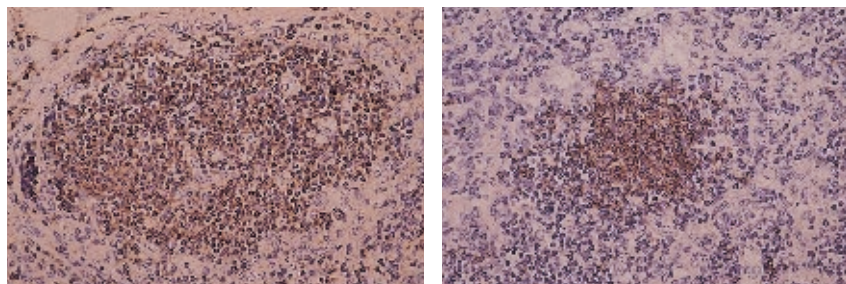
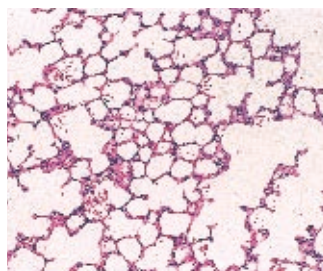


Figure : immunohistochemical staining fixed by Mildform® 20N. (Human lymph node tissues pan B)

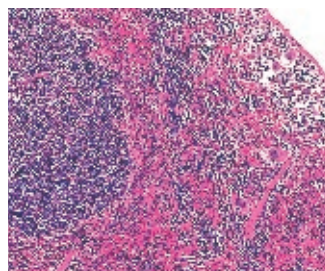
Related Products

Embedded Medium for Mouse and Rat tissues

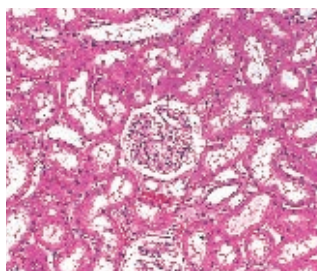
Wako Catalog No.	Description	Package Size	Melting Point
167-20501	Pathoprep® 546	2 kg × 3	54 ~ 56 °C
162-18961	Pathoprep® 568	500 g × 12	56 ~ 58 °C
165-19551	Pathoprep® 580	2 kg × 3	58 ~ 60 °C



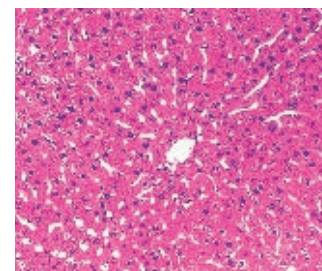
Mouse Lung (HE staining) × 10



Mouse Spleen (HE staining) × 10



Rat Kidney (HE staining) × 10



Rat Liver (HE staining) × 10

Figures : application of Pathoprep® 546

Substance suppressing bone resorption

Disodium Etidronate

for Pharmacology

Cat.# 058-07181 200 mg

054-07183 1 g

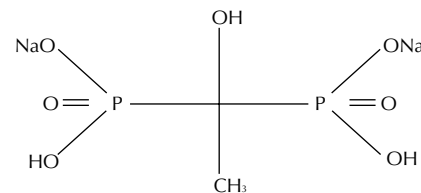
052-07184 5 g

RT, Solid

This product is a bisphosphonate compound which suppresses bone resorption by osteoclasts and inhibits progress of heterotopic ossification.

Assay (titration) : 95.65 % (the measured value of Lot No. PKM2966)

pH (10 g/L, 25 °C) : 4.2-5.2



$C_2H_6Na_2O_7P_2 = 249.99$

Cytokines associated with bone metabolism

Bone Morphogenetic Protein 14, Human, rec. (BMP-14: bone morphogenetic protein 14)

for Cellbiology

Cat. #023-14941 10 μ g

RT, Lyophilized

BMP-14/CDMP-1 is known as a principal initiator of cartilage formation and is predominantly expressed in long bones during human embryonic development. It is expressed in cartilage germ of limbs, however, not in trunk bones. It is a human homologous gene product of GDF-5 (Growth/differentiation factor-5), a member of TGF- β superfamily.

Parathyroid Hormone Related Protein, Human, rec. (PTHrP: Parathyroid Hormone Related Protein)

for Cellbiology

Cat. #165-21141 50 μ g

-20 °C, D/I, Lyophilized

PTHrP shares the N-terminal amino acid sequence homology with PTH. At this sequence, PTHrP exhibits PTH-like action. In cartilage formation, PTHrP acts as a local cytokine and plays a vital role in metastasis to bone from breast cancer.

Sonic Hedgehog, Human, rec. (Shh: sonic hedgehog)

for Cellbiology

Cat. #199-12891 25 μ g

-20 °C, D/I, Lyophilized

Shh is a member of hedgehog family and is a cytokine involved in morphogenesis including left-right orientation of axis and limb bud dorsal-ventral patterning.

Macrophage Colony Stimulating Factor, Mouse, rec. (M-CSF: macrophage colony stimulating factor)

for Cellbiology

Cat. #135-14391 10 μ g

RT, Lyophilized

M-CSF is generated by monocytes, fibroblasts, and endothelial cells, and it inhibits bone resorption by osteoclasts by stimulating macrophages and promoting antibody-dependent cytotoxicity by monocytes and macrophages.

8. Pharmacological Research

Nonylic Vanillylamide [N-Vanillylamide]

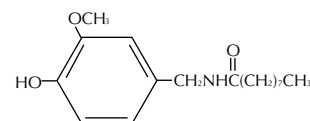
for Pharmacology

Cat. #142-07631 1 g

#148-07633 10 g

2~10 °C, Solid

This product is one of synthesized capsaicins with anti-inflammatory effect. It can be used for confirmation tests listed in Japanese Pharmacopoeia.



$C_{17}H_{27}NO_3 = 293.40$

Ascorbyl Tetra-2-hexydecanoate [Ascorbic Acid, oil soluble]

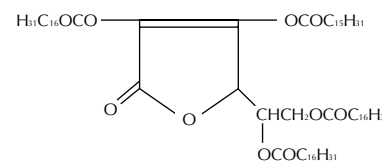
for Biochemistry

Cat. #012-19591 10 g

#018-19593 50 g

RT, Liquid

This product is an oil-soluble vitamin C which can be easily absorbed to cell surface. It inhibits melanogenesis and exhibits skin-whitening effect.



$C_{70}H_{128}O_{10} = 1129.76$

A New RNA Marker

RNA Size Standard Marker IV (0.28 ~ 6.58 kb)

for Genetic Research

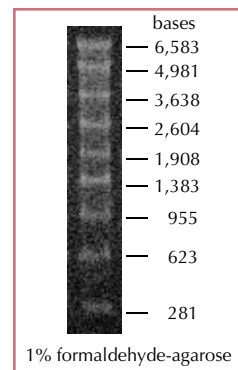
Cat. #188-01831 50 µg

-80 °C, D/I, Liquid

In vitro transcribed RNA product of 9 sizes including 281, 623, 955, 1,383, 1,908, 2,604, 3,638, 4,981, and 6,583b. In glyoxal or formaldehyde agarose gel electrophoresis, it can be used as RNA-size-standard. Analysis with ethidium bromide staining visualizes the bands.

Appearance : 10 mmol/L Tris-HCL (pH 8.0), 1 mmol/L EDTA

Application : 3 µL/lane



Related Products

Wako Cat. #	Description	RNA Size	Package Size
541-00741	RNA Size Standard Marker	100, 200, 300,400, 500b	25 µg
542-00651	RNA Size StandardMarker II	0.5k, 1k, 1.5k, 2k, 2.5k, 3k, 4k, 5k, 6k, 9kb	50 µg
545-01621	RNA Size Standard Marker III (100b-1kb)	100, 200, 300,400, 500, 750, 1,000b	50 µg
548-01731	Ribosomal RNA Marker (16S + 23S)	1,776, 3,566b	2.5 mg
545-01741	Ribosomal RNA Marker (18S + 28S)	2,000, 5,300b	250 µg

Completely inactivated by heating at 65 °C

Alkaline Phosphatase Solution, from Shrimp

Cat. #544-02291 500 units

-20°C, D/I, Liquid

Alkaline Phosphatase is used for the preparation of PCR generated DNA for sequencing, or dephosphorylation of DNA vector for cloning and DNA for end labeling. This Shrimp Alkaline Phosphatase is completely inactivated by heating at 65 °C for 15 minutes unlike Calf Intestinal Alkaline Phosphatase. It's simple and quick procedures.

[Features]
1. Completely inactivated by heating at 65 °C

RNA i Reagents

Control siRNA duplex, Jellyfish GFP (manufactured by Nippon Gene)

Cat. #314-05911 5 nmol

2~10 °C, Lyophilized

[Features]

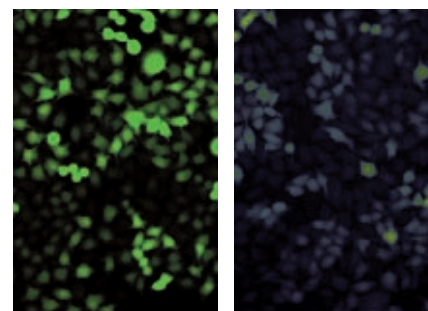
1. Control siRNA duplex products are double-stranded siRNAs comprised of sequences reported to demonstrate RNAi (RNA interference) in articles¹⁾²⁾³⁾ and can be used as positive controls in conducting RNAi experiments.
2. 5nmol siRNA freeze-dried
3. Can be used approx. 80 times for experiments to transfect cells cultured in a 24-well plate with 60pmol siRNA.

Experiment

1 × 10⁵ HeLa cells expressing EGFP were transfected with Control siRNA duplex, Jellyfish GFP (100nmol/L final concentration) using lipofection method. 48 hrs. after transfection, RNAi effect was observed by fluorescent microscopy.

[Result]

As shown in the pictures above, EGFP expression was inhibited by transfection with Control siRNA duplex, Jellyfish GFP.



Control (H₂O)

siRNA (100nmol/L)

[References]

1) Harborth, J. et al. : *J. Cell Sci.*, **114**, 4557 (2001).
 2) Caplen, NJ. et al. : *Proc. Natl. Acad. Sci. USA*, **98**, 9742 (2001).
 3) Elbashir, S. M. et al : *Nature* (London), **411**, 494 (2001).

SP6 RNA Polymerase, recombinant, Solution

Cat. #543-02261 5,000 units
-20°C, D/I, Liquid

T3 RNA Polymerase, recombinant, Solution

Cat. #540-02271 5,000 units
-20°C, D/I, Liquid

T7 RNA Polymerase, recombinant, Solution

Cat. #543-02021 5,000 units
-20°C, D/I, Liquid

Each product is a DNA-dependent RNA polymerase which synthesizes RNA from a double-stranded DNA template containing either SP6, T3, or T7 promoter. RNA is specifically synthesized from downstream of promoter sequences

[Contents]

[SP6, T3 RNA Polymerase]

SP6, T3 RNA Polymerase, recombinant, Solution 5,000 units
100 nmol/L DTT 1mL
5 × Transcription Buffer 2.5 mL

[T7 RNA Polymerase]

T7 RNA Polymerase, recombinant, Solution 5,000 units
10 × Transcription Buffer 0.5 mL

ANALYTICAL CHEMISTRY

1. HPLC

Packed column for HPLC
Wakopak® Navi products
Wakopak® Navi C18-5

Upgraded ODS packing

Silica gel with 5µm particle diameter is used, and the purity is higher than conventional silica gel. Octadecyl modification is refined and the product is fully endcapped. It is amenable to various applications and is optimum as the first-choice column.

Examples of analyses

Analysis of linear carboxylic acids

Conditions

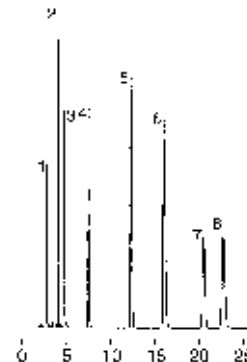
Column size: 4.6 × 250mm
Eluent : 20mmol/L NaH₂PO₄ (pH 2.5)
Flow rate : 1.0mL/min.
Temp. : 35°C
Detection : UV 210nm 0.04Aufs
Sample : 1) Oxalic Acid
2) Tartaric Acid
3) Formic Acid
4) Lactic Acid
5) Acetic Acid
6) Citric Acid
7) Fumaric Acid
8) Succinic Acid
9) Acrylic Acid
10) Propionic Acid
11) Levulinic Acid



Analysis of water-soluble vitamins

Conditions

Column size: 4.6 × 250mm
Eluent : CH₃CN/0.1% H₃PO₄,
5mmol/L SHS = 10/90 (v/v)
Flow rate : 1.0mL/min.
Temp. : 40°C
Detection : UV 210nm 0.16Aufs
Sample : 1) L(+)-Ascorbic acid (V.C)
2) Nicotinic Acid
3) Nicotinamide
4) Pyridoxine·HCl (V.B₆)
5) Caffeine
6) Thiamine·HCl (V.B₁)
7) d-Biotin (V.H)
8) Riboflavin (V.B₂)
* SHS : Sodium 1-Hexane sulfonate



Description	Column Size	Column Joint Type
Wakopak® Navi C18-5	4.6 × 150 mm 4.6 × 250 mm	DuPont (D), Waters (W)
Wakopak® Navi C22-5	4.6 × 150 mm 4.6 × 250 mm	
Wakopak® Navi C30-5	4.6 × 150 mm 4.6 × 250 mm	

Navi C22-5 : dococyl-bonded silica is used as packing material. By using mobile phase with high water content, purification and retention characteristics higher than that of C18 can be obtained.

Navi C30-5 : silica used for this packing is polymerically bonded with triacontyl group. Characterized by outstanding structural recognition and effectiveness in analyzing homologues.

Available in a variety of sizes ranging from semi-micro column to high capacity column.

2-Bromoethanol Standard

for Assessment of Working Environment

Cat. #024-14851 500 mg

RT, Liquid

Industrial Safety and Health Law was partly amended on Mar. 28, 2001, and ethylene oxide was added to Group-2 Substances of the Attached Table 3-2 of Enforcement Order of the Industrial Safety and Health Law.

Accordingly, Ordinance on Prevention of Hazards Due to Specified Chemical Substances, Environment Measurement Standards, and Working Environment Evaluation Standards were partly amended which obliged measurement of ethylene oxide in working environment on May. 1, 2002.

This product can be used as a standard in measuring ethylene oxide in working environment.

A new item for analysis of food and food additives

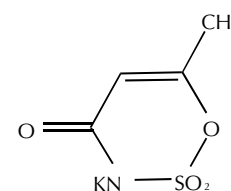
Acesulfame K Standard, 99.0 +% (by HPLC)

for HPLC

Cat. #019-19481 500 mg

2~10 °C, Solid

Acesulfame K has already been registered as a food additive, however, Notification No. 58 issued on Dec. 28, 2001 by Standards and Evaluation Division, Dept. of Food Safety of Ministry of Health, Labor, and Welfare stipulated the HPLC analysis method for acesulfame K. As this product guarantees the content (HPLC), it can be used as HPLC standard.

C₄H₄KNO₄S=201.24

A new standard for analysis of animal drugs

Levamisole Hydrochloride Standard, 99.0 +% (by HPLC)

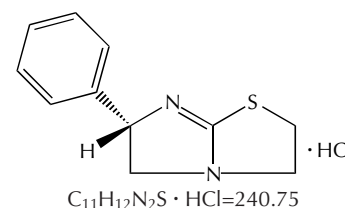
for HPLC

Cat. #126-04991 200 mg

2~10 °C, Solid

Residue ppm : 0.01 ppm

Note : This is a parasite control drug.

C₁₁H₁₂N₂S · HCl=240.75

ORGANIC CHEMISTRY

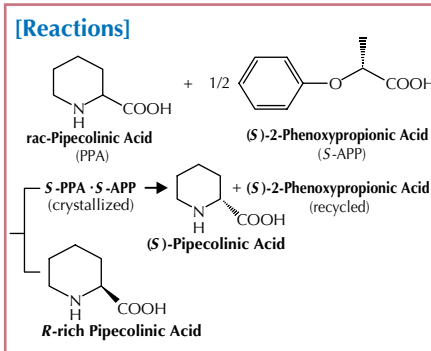
1. Optical Resolution

Optical Resolution Reagents

Enantiomeric pairs with high optical purity are available as optical resolution reagent via diastereomeric salt formation.

The product allows large scale processing and can be recovered for reuse.

Wako Cat. #	Description	Assay (HPLC)	Optical Purity (HPLC)	Package Size
325-41021	(R)-(+)-1-Benzylamino-3-phenoxy-2-propanol	97.0+ %	98.0+ %ee	5 g
323-41022				25 g
322-41031	(S)-(-)-1-Benzylamino-3-phenoxy-2-propanol	97.0+ %	98.0+ %ee	5 g
320-41032				25 g
329-41041	(2R,3R)-(+)-Tartranilic Acid	97.0+ %	98.0+ %ee	5 g
327-41042				25 g
326-41051	(2S,3S)-(-)-Tartranilic Acid	97.0+ %	98.0+ %ee	5 g
324-41052				25 g
323-41061	(R)-(+)-2-Phenoxypropionic Acid	97.0+ %	98.0+ %ee	5 g
321-41062				25 g
320-41071	(S)-(-)-2-Phenoxypropionic Acid	97.0+ %	98.0+ %ee	5 g
328-41072				25 g



HAP-supported catalyst for organic synthesis:
Environmentally benign and clean oxidation
catalyst in the presence of molecular oxygen
Ruthenium(III)-Hydroxyapatite (RuHAP)
for Organic Synthesis

Cat. # 182-01851 1 g
188-01853 5 g

RT, Solid

RuHAP, developed by Prof. Kiyotomi Kaneda of Osaka Univ., is a novel, bound oxidation catalyst in the presence of molecular oxygen. Hydroxyapatite is a natural, inorganic crystallized compound. Using its surface as ligand, RuHAP is obtained by treating the surface with RuCl₃ aqueous solution. Because molecular oxygen (O₂) or air is used for reaction, it is unnecessary to use toxic heavy metals such as chromic acid or manganese dioxide, and clean oxidation can be carried out.

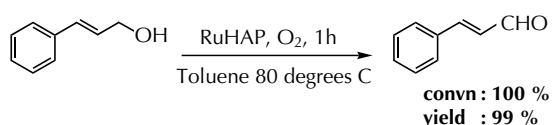
*Wako could receive the requests for
chemical synthesis, relating to Green
Chemistry.*

[Features]

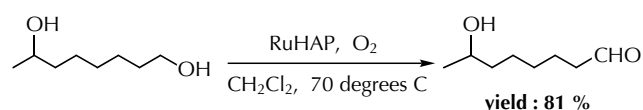
1. High activity catalyst, 2. can be separated easily from products, 3. recyclable, 4. clean Aerobic oxidation without using toxic reagents

[Reactions]

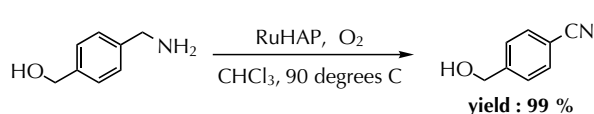
Oxidation of alcohols



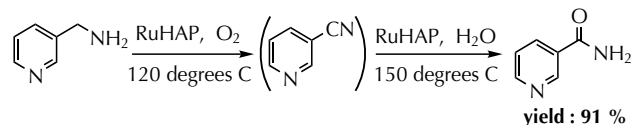
Intracellular competitive oxidation of primary and secondary alcohols



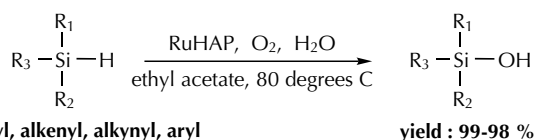
Intracellular competitive oxidation of amine and alcohol



Oxidation of amines



Oxidation of silanes



[Reference]

- 1) Yamaguchi, K., Mori, K., Mizugaki, T., Ebitani, K. and Kaneda, K.: *J. Am. Chem. Soc.*, **122**, 7144 (2000).
- 2) Mori, K., Yamaguchi, K., Mizugaki, T., Ebitani, K. and Kaneda, K.: *Chem. Commun.*, **461** (2001).
- 3) Mori, K., Tano, M., Mizugaki, T., Ebitani, K. and Kaneda, K.: *New J. Chem.*, **1536** (2002).

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