Neuroscience Research

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D. Parkinson's Disease
E. Antibodies
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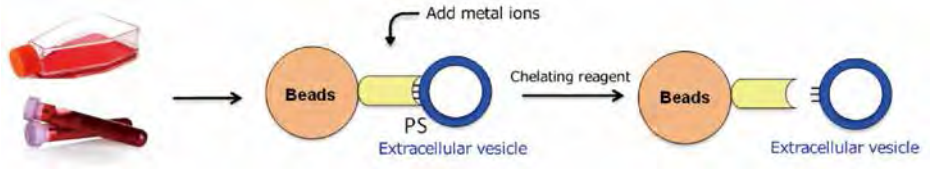
A. Exosome Isolation Kit

Exosome isolation by novel affinity molecule

MagCapture™ Exosome Isolation Kit PS

Exosomes are membrane vesicles with 50 to 100 nm in diameter, comprising a lipid bilayer membrane, that are secreted from cells and involved in intercellular communication.[1] Exosomes contain mRNA, miRNA, and various proteins, and these factors have been reported to play a role in neuronal and glial signal transduction.[2] In addition, studies have reported that exosomes contain Aβ and Tau, which are considered related to development of Alzheimer's disease, as well as α-synuclein, which is considered related to development of Parkinson's disease. Elucidation of the potential relationships with these neurodegenerative disorders and use of exosomes as a biomarker are expected.[1]

Affinity method for phosphatidylserine (PS) on membrane surface of extracellular microvesicles



Using Phosphatidylserine (PS)-binding protein, extracellular vesicles are captured in a metal ion-dependent manner, followed by eluting them with metal ion chelating reagent.

References

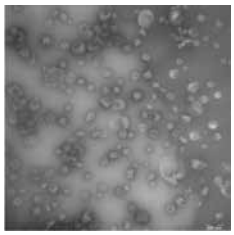
1) Properzi, F,, *et al.: Biomark, Med.,* **7** (5), 769 (2013).
2) Frühbeis, C., *et al.: Front. Cell Neurosci.,* **7**, 182 (2013).

Features

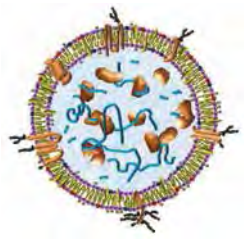
High purity exosomes can be easily isolated by PS affinity method

Novel affinity method	• Recovery by a PS-binding molecule • Low background • Mild elution by a chelating reagent on a neutral pH condition
Not required ultracentrifugation	• Improved operation by using magnetic beads • Optimized protocol

High purity of intact exosomes



High reproducibility



Comparison with other purification method			
Methods	Exosome purity	Exosome recovery	Intact vesicles recovery
MagCapture™ (PS affinity method)	●●●●●	●●●●	Yes
Ultracentrifugation	●●	●●	Yes
Polymer-based precipitation	●	●●●●●	Yes
Exosome surface antigen affinity method (using the antibody)	●●●	●	No

Target samples: cell culture supernatant, serum, urine, *etc.*

NOTE: This kit is NOT suitable for exosome isolation from plasma treated with chelating agents such as EDTA and citric acid.

Product Name	Wako Cat. No.	Package Size	Storage Condition
MagCapture™ Exosome Isolation Kit PS	293-77601	10 tests	Keep at 2-10°C.

The yield comparison of exosome isolated from human serum

Exosomes were isolated from human serum by using **MagCapture™**, ultracentrifugation and antibody affinity method, followed by western blot with the anti CD9, anti CD63 and CD81 antibodies.

CD9, CD63 and CD81 are exosome markers.

Lane 1: Ultracentrifugation
Lane 2: MagCapture™
Lane 3: Exosome Isolation kit (CD9) [Company A]
Lane 4: Exosome Isolation Kit (CD63)[Company A]
Lane 5: Exosome Isolation Kit (CD81)[Company A]
Lane 6: Exosome Isolation Kit (Antibody beads-mixture of CD9, CD63, CD81 & EpCAM)

The yield of exosomes by **MagCapture™** is higher than ultracentrifugation or antibody affinity method.

The performance comparison with conventional exosome isolation methods

The yield and purity were compared for exosomes isolated from K562 (human chronic mylogenous leukemia: CML) cell culture supernatants (serum-free medium, or 10% Exosome-depleted FBS medium) by using MagCapture™, ultracentrifugation and polymer-based precipitation method.

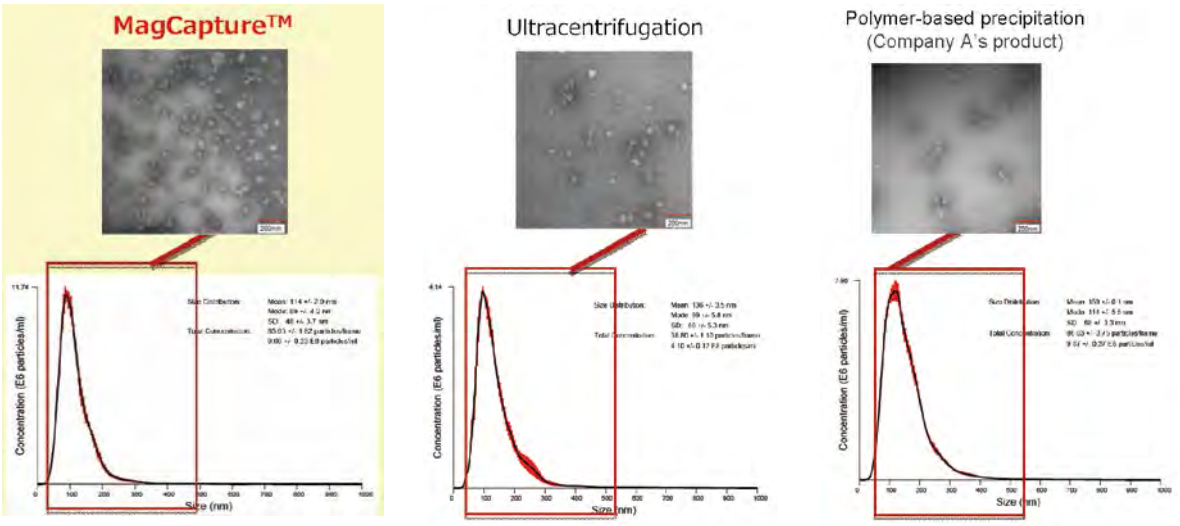
MagCapture™ Exosome Isolation Kit PS
Exosomes were collected from 1 mL of pretreated (10,000 × g, 30 min) K562 cell culture supernatant (serum-free medium or 10% exosome-depleted FBS medium) by using MagCapture™ standard protocol (reaction time: 3 hours)

Ultracentrifugation
Exosome fractions were collected from 10 mL of pretreated (10,000 × g, 30 min.) K562 cell culture supernatant (serum-free medium or 10% exosome-depleted FBS medium) by ultracentrifugation (110,000 × g, 70 min.). The precipitates were suspended by TBS and then exosomes were recovered by ultracentrifugation (110,000 × g, 70 min.) as a pellet.

Polymer-based precipitation
Exosomes were collected from 1 mL of pretreated (10,000 × g, 30 min) K562 cell culture supernatant (serum-free medium or 10% exosome-depleted FBS medium) by using Company A's product protocol (Precipitation time: overnight).

Electron microscopic analysis and Nano analysis of isolated exosomes

The particle size of exosomes from K562 cell culture supernatant (serum-free medium) using **MagCapture™**, ultracentrifugation and polymer-based precipitation, respectively was determined by using NanoSight LM-10. The collected exosomes (2-4 × 10^{10} particles) were fixed by 2% paraformaldehyde and analyzed by electron microscopy.



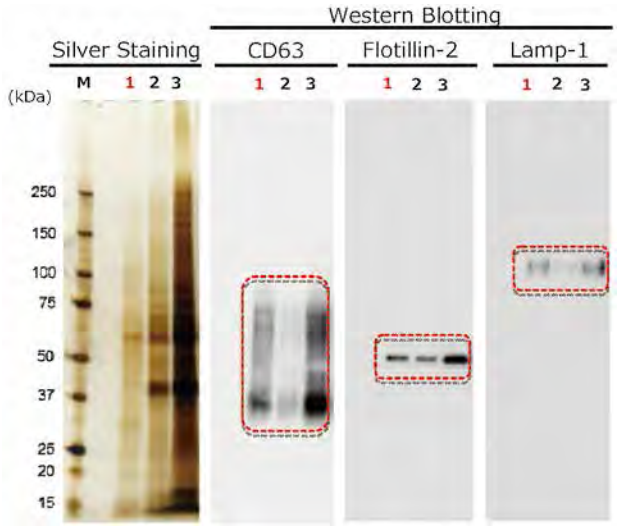
Electron microscope images were provided by Dr. R. Hanayama at Graduate School of Medicine, Kanazawa University and Dr. W. Nakai at iFReC, Osaka University.

MagCapture™ could enrich exosomes which were uniformed particles (~100 nm)!

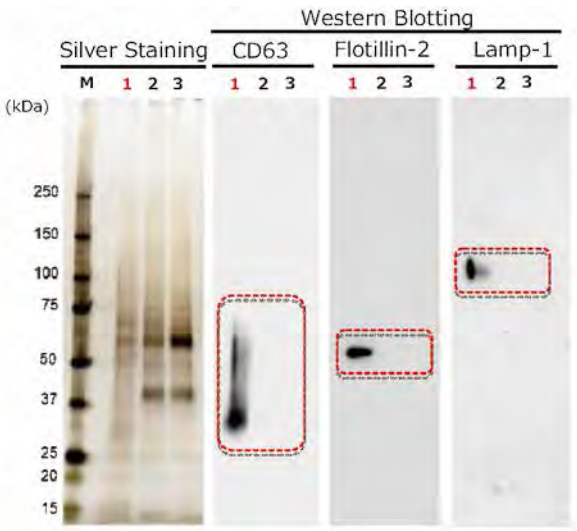
The comparison of recovery amount and purity of exosomes (1)

Exosomes were collected from K562 cell culture supernatant (**serum-free medium**) by MagCapture™, ultracentrifugation and polymerbased precipitation. The recovery efficiency and purity were analyzed by silver staining and western blotting by using anti CD63, anti Flotillin-2 and anti Lamp-1 antibodies).

Comparison of recovery amount
(Recovery amount from 150μL cell culture supernatant)



Purity comparison
(Amount of marker proteins / 200ng of total protein)



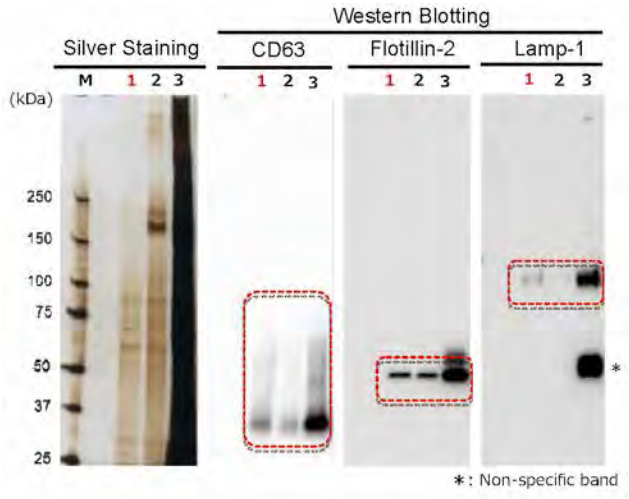
Lane 1: MagCapture™
Lane 2: Ultracenrifugation
Lane 3: Polymer-based precipitation [Company A]

With **MagCapture™**, the recovery performance of exosomes is excellent and the amount of contaminant proteins is very low, so the balance of purity and recovery efficiency is the best!!

The comparison of recovery amount and purity of exosomes (2)

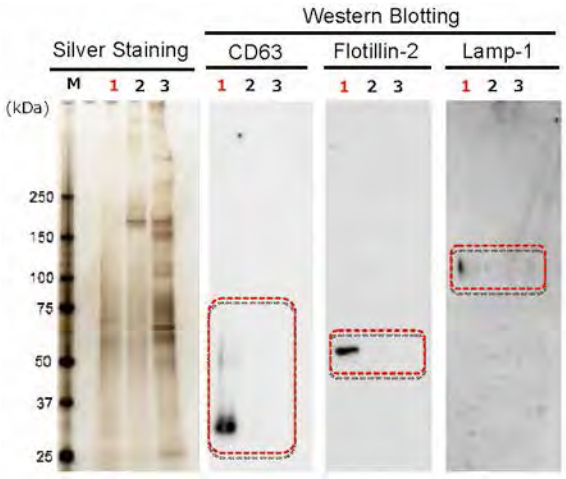
The exosomes were collected from K562 cell culture supernatant (**10% exosome-depleted FBS medium**) by MagCapture™, ultracentrifugation and polymer-based precipitation. The recovery efficiency and purity of exosomes analyzed by silver staining and western blotting by using anti CD63, anti Lamp-1 and anti Flotillin-2 antibodies. Furthermore, collected sample from each was analyzed by mass spectrometry and compared the percentage of human-derived peptides derived from K562 cells.

Comparison of recovery amount
(Recovery amount from 150μL cell culture supernatant)

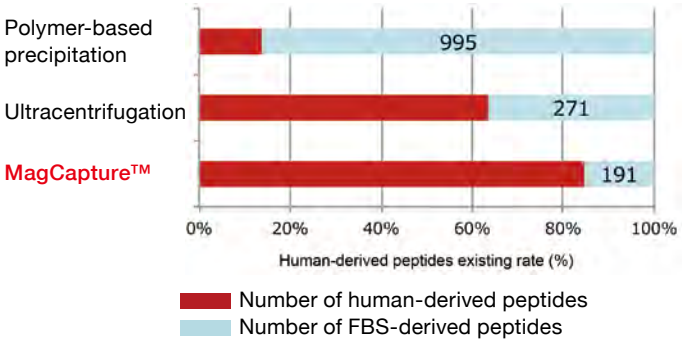


Comparison of human-derived peptides identified by MASS analysis

Purity comparison
(Amount of marker proteins / 200ng of total protein)



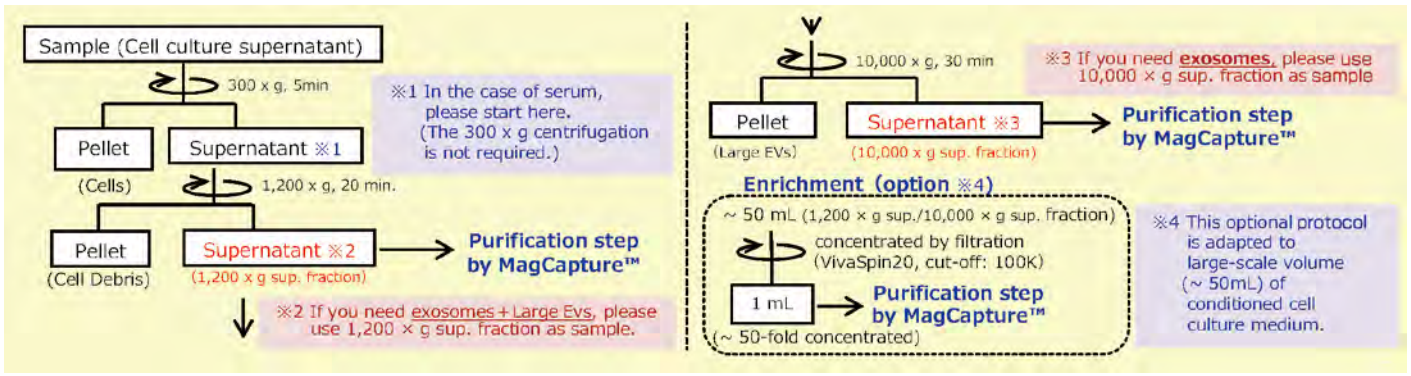
Lane 1: MagCapture™
Lane 2: Ultracenrifugation
Lane 3: Polymer-based precipitation [Company A]



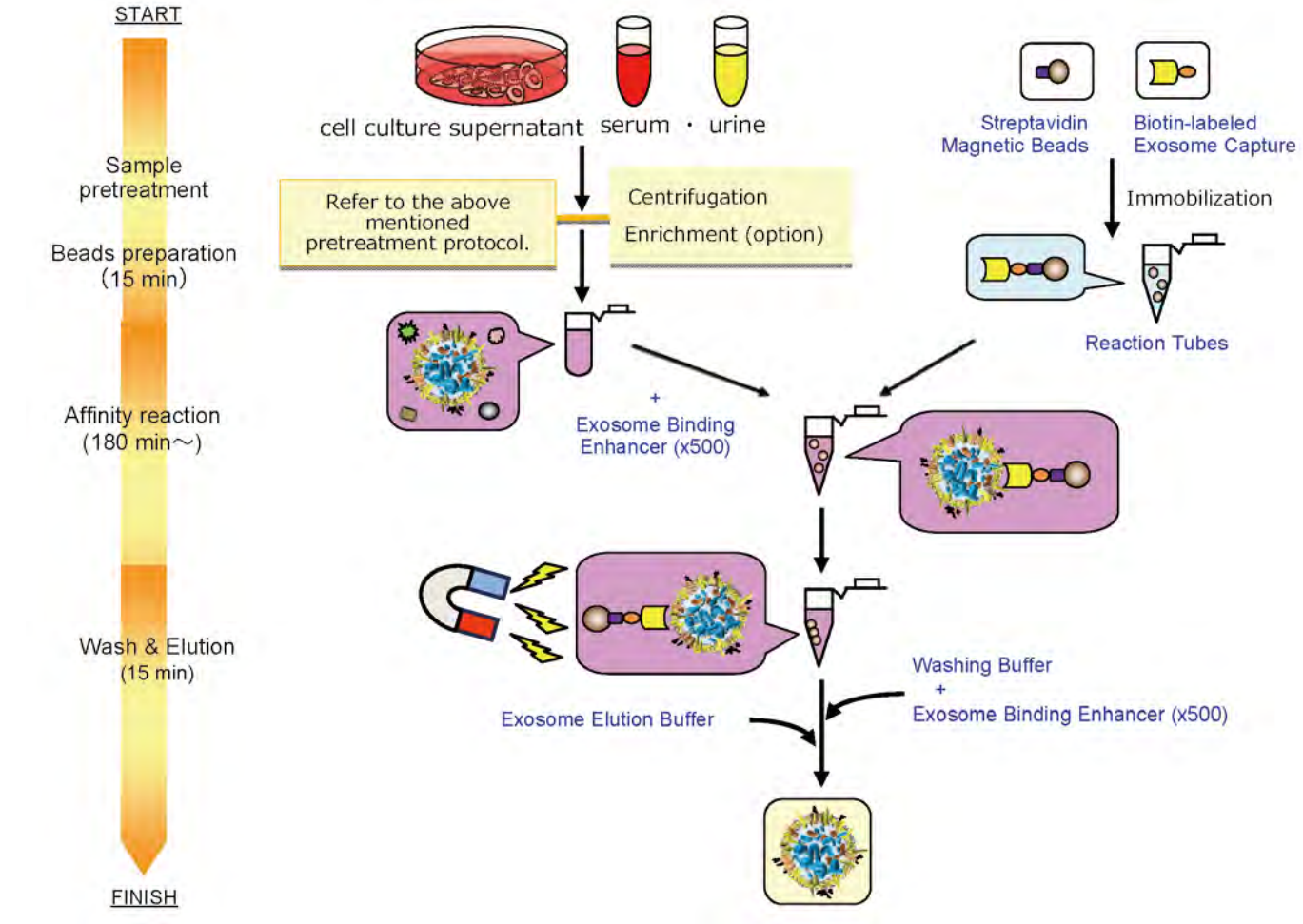
MASS analysis data was provided by Dr. R. Hanayama at Graduate School of Medicine, Kanazawa University and Dr. W. Nakai at iFReC Osaka University.

With **MagCapture™**, high purity exosomes are recovered even from culture medium with FBS, so MASS analysis with low background can be done!

Pretreatment protocol from cell culture supernatant or serum



Exosome Isolation Flow Chart

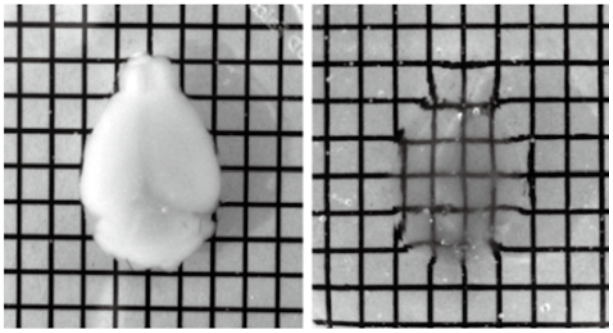


B. CLARITY

A technique to make tissue transparent
CLARITY related reagents

"CLARITY" was published as a new technique to make tissue transparent by Dr. Karl Deisseroth and his colleagues at Stanford University of Medicine in the journal Nature on March 2013.
Since "CLARITY" is available for immunostaining with fluorescent proteins and antibodies, it is expected as a useful tool for analysis of the brain and neural networks. VA-044 corresponds to a reagent used in the clearing process in the protocol of the paper.

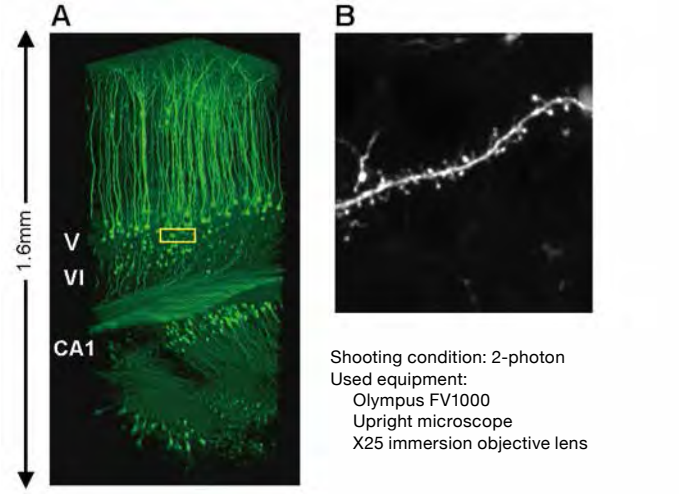
Chung,K *et al*.: *Nature*., **497**, 332 (2013).
Hsueh, B *et al*.: *Nature Protocols*., **9** (7), 1682 (2014).



Mouse brain before CLARITY treatment

Mouse brain after CLARITY treatment

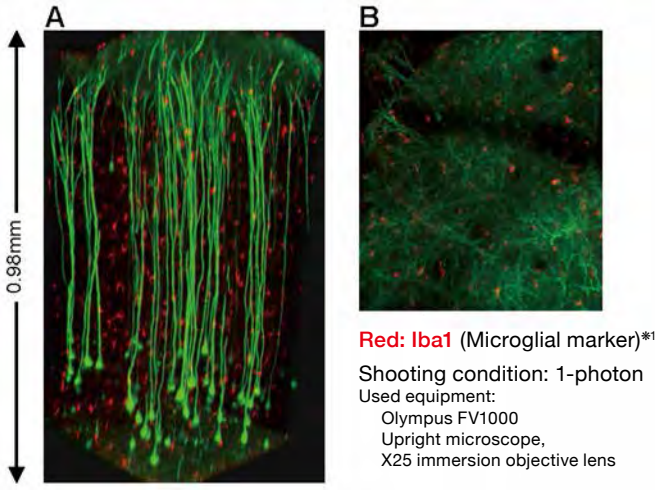
Imaging of mouse brain with CLARITY



Shooting condition: 2-photon
Used equipment:
Olympus FV1000
Upright microscope
X25 immersion objective lens

Fig. 1. Fluorescence imaging of Thy1-YFP (H Line) mouse cerebrum after CLARITY treatment
(A) A 3D image from the brain mantle to hippocampus
(B) An image of dendrites of pyramidal cells in the cerebral cortex layer V

Imaging of mouse brain with CLARITY + antibody treated



Red: Iba1 (Microglial marker)*1

Shooting condition: 1-photon
Used equipment:
Olympus FV1000
Upright microscope,
X25 immersion objective lens

Fig. 2. Fluorescence imaging of Thy1-YFP (H Line) mouse cerebrum immunostained with Iba1 antibodies after CLARITY treatment
(A) A 3D image of microglia in the brain mantle
(B) An image of the cortex layer I from the surface layer

Product Name	Wako Cat. No.	Package Size	Grade
VA-044 [2,2'-Azobis[2-(2-imidazolin-2-yl)propane] Dihydrochloride]	223-02112 225-02111 227-02115	25 g 100 g 500 g	for Cellbiology
	LB-VA044-50GS*2 011-19365*2	50 g 500 g	

*2: Available for sale in the US only

*1: Related Products

Product Name	Wako Cat. No.	Package Size	Grade
Anti Iba1, Rabbit (for Immunocytochemistry) Please see the page No.16	019-19741	50 µg	for Immunochemistry

CLARITY -Protocol-

STEP1
Soak the brain tissue in Hydrogel Monomer Solution at 4°C. Polymerize Hydrogel Monomer Solution at 37°C to fix proteins.

STEP2
Remove lipids by conducting electrophoresis at around 37°C. Soak them in glycerol for 2 days for observation with fluorescent proteins.

STEP3
Conduct immunostaining with antibodies.

STEP4
Samples are soaked in glycerol for 2 days until observation under the 2-photon microscopy.

[Hydrogel Monomer Solution Composition]

- VA-044 ····· 1 g
- 40% Acrylamide ····· 40 mL
- 2% Bisacrylamide ····· 10 mL
- 10x PBS ····· 40 mL
- 16% Paraformaldehyde ····· 100 mL
- Saponin ····· 200 mg

[Electrophoresis buffer]

- Boric Acid ····· 123.66 g
- SDS ····· 400 g
- NaOH ····· Adjust to pH 8.5
- Water ····· Add to 10 L

[Equipment]

- Electrophoresis Chamber for Lipid Extraction
- Circulating pump

CLARITY -Related Products-

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
Acrylamide	017-08012 019-08011 011-08015	25 g 100 g 500 g	for Electrophoresis	Keep at RT.
N,N'-Methylenebis (acrylamide)	138-06032 130-06031	25 g 100 g	for Electrophoresis	Keep at 2~10°C.
10x PBS(-)	163-25265	500 mL	for Cell Culture	Keep below 25°C.
Paraformaldehyde	160-16061 162-16065	100 g 500 g	for Tissue Fixation	Keep at RT.
16w/v% Paraformaldehyde Solution, Methanol free	167-25981 163-25983	1 mL × 10A 10 mL × 10A	for Electron Microscopy	Keep at RT.
Saponin, from Soybeans	198-08853 192-08851 190-08852	1 g 5 g 25 g	Wako 1st Grade	Keep at 2~10°C.
Boric Acid	027-02192 029-02191 021-02195 023-02194	25 g 100 g 500 g 4 kg	JIS Special Grade	Keep at RT.
Sodium Dodecyl Sulfate	190-13982 192-13981 194-13985	25 g 100 g 500 g	for Molecular Bioiloy	Keep at RT.

RT: room temperature

1. Tau proteins

Antibodies

3R-tau specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
016-26581	**Anti 3R-Tau, Rat Monoclonal Antibody (2A1-1F4)**	for Immunochemistry	50 µL	Keep at -20°C.

Antibody information

Antigen	3R-Tau	Application	WB/IP	Isotype	IgG2b
Antigen information	Synthetic peptide (267-274, 306-313aa region of Human Tau)	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	3-Repeat Tau isoform	Host	Rat	Clone No.	2A1-1F4
Summary	Tau is one of microtube-associated proteins, mainly expressed in neuron in central nerve system, and regulates stabilization of microtube. In the brain of Alzheimers' disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of this tangles correlates to severity of dementia. Based on these findings, Tau has been investigated to find out etiology and to discover drugs for Alzheimer's diseases. Tau is classified into 3R-Tau and 4R-Tau which has 3 and 4 microtube association domains, respectively. This product is an antibody that specifically recognizes 3R-Tau.				

4R-Tau specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
013-26591	**Anti 4R-Tau, Monoclonal Antibody (3E8-1A6)**	for Immunochemistry	50 µL	Keep at -20°C.

Antibody information

Antigen	4R-Tau	Application	WB/IP	Isotype	IgG1
Antigen information	Synthetic peptide (273-291aa region of human Tau)	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	4-Repeat Tau isoform	Host	Mouse	Clone No.	3E8-1A6
Summary	Tau is one of microtube-associated proteins, mainly expressed in neuron in central nerve system, and regulates stabilization of microtube. In the brain of Alzheimers' disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of this tangles correlates to severity of dementia. Based on these findings, Tau has been investigated to find out etiology and to discover drugs for Alzheimer's diseases. Tau is classified into 3R-Tau and 4R-Tau which has 3 and 4 microtube association domains, respectively. This product is an antibody that specifically recognizes 4R-Tau.				

Phosphorylated Tau (T181) specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
016-26601	**Anti Phosphorylated Tau T181, Rat Monoclonal Antibody (2E2-A6)**	for Immunochemistry	50 µL	Keep at -20°C.

Antibody information

Antigen	Phosphorylated Tau T181	Application	WB/IHC	Isotype	IgG2b
Antigen information	Synthetic peptide (homologous peptide of human Tau with phosphorylated T181)	Species cross reactivity	-	Label	Unlabeled
Antigen synonyms*	Microtubule-Associated Protein Tau, MAPT, MTBT1 ※Alias of Tau	Host	Rat	Clone No.	2E2-A6
Summary	Tau is one of microtube-associated proteins, mainly expressed in neuron in central nerve system, and regulates stabilization of microtube. In the brain of Alzheimers' disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of this tangles correlates to severity of dementia. Based on these findings, Tau has been investigated to find out etiology and to discover drugs for Alzheimer's diseases. This product is an antibody that specifically recognizes Tau with phosphorylated threonine at position 181.				

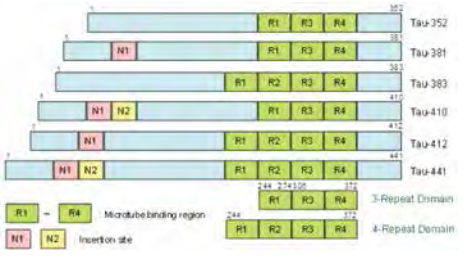
Phosphorylated Tau (S199) specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
013-26611	**Anti Phosphorylated Tau S199, Rat Monoclonal Antibody (5B8-1E2)**	for Immunochemistry	50 µL	Keep at -20°C.

Antibody information

Antigen	Phosphorylated Tau S199	Application	WB/IHC	Isotype	IgG2a
Antigen information	Synthetic peptide (homologous peptide of human Tau with phosphorylated S199)	Species cross reactivity	-	Label	Unlabeled
Antigen synonyms*	Microtubule-Associated Protein Tau, MAPT, MTBT1 ※Alias of Tau	Host	Rat	Clone No.	5B8-1E2
Summary	Tau is one of microtube-associated proteins, mainly expressed in neuron in central nerve system, and regulates stabilization of microtube. In the brain of Alzheimers' disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of this tangles correlates to severity of dementia. Based on these findings, Tau has been investigated to find out etiology and to discover drugs for Alzheimer's diseases. This product is an antibody that specifically recognizes Tau with phosphorylated serine at position 199.				

Product Name	Wako Cat. No.	Package Size
Tau-352 Protein, Human, recombinant	204-20281	100 µg
Tau-381 Protein, Human, recombinant	201-20291	100 µg
Tau-383 Protein, Human, recombinant	204-20301	100 µg
Tau-410 Protein, Human, recombinant	201-20311	100 µg
Tau-412 Protein, Human, recombinant	208-20321	100 µg
Tau-441 Protein, Human, recombinant	205-20331	100 µg
Tau Protein 3-Repeat Domain, Human, recombinant	202-20341	100 µg
Tau Protein 4-Repeat Domain, Human, recombinant	209-20351	100 µg



2. Fluorescent probes

BF-168 Senile plaque-selective fluorescent probe
BF-170 Neurofibrillary tangle change-selective fluorescent probe
BF-187/BF-188 Senile plaque/neurofibrillary tangle dual target probes

Features

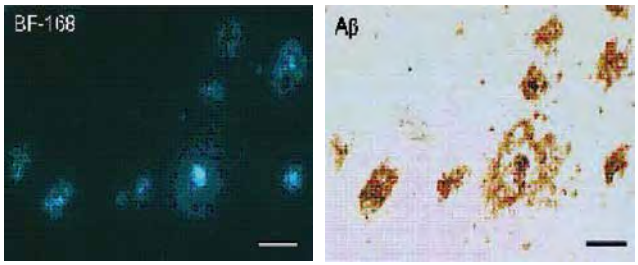
- Staining complete in 10 min
- Cost-effective

Applications

BF-168

Senile plaque-selective fluorescent probe

BF-168 | Staining with anti-Aβ antibody

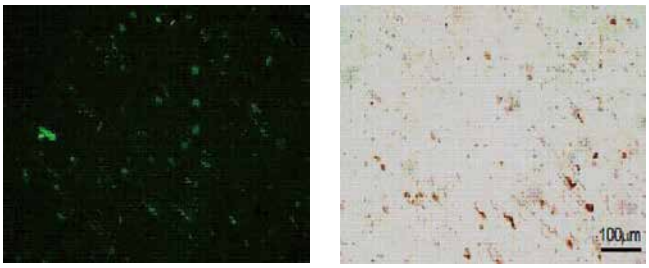


→ BF-168 is equally effective as anti-Aβ antibody in staining of senile plaques (Aβ).

BF-170

Neurofibrillary tangle change-selective fluorescent probe

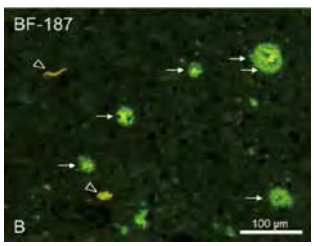
BF-170 | Staining with anti-phosphorylated Tau antibody



→ BF-170 is equally effective as anti-phosphorylated tau antibody in staining of neurofibrillary tangles (phosphorylated Tau).

BF-187

Senile plaque/neurofibrillary tangle dual target probe

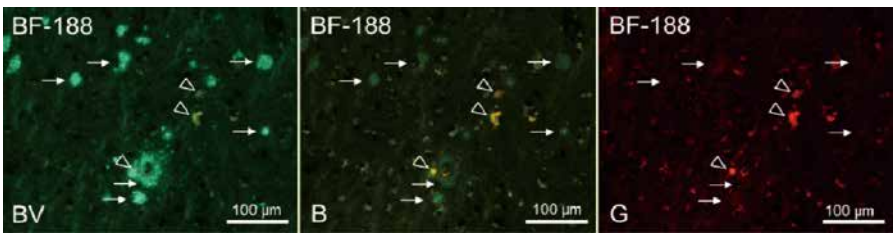


→ Both senile plaques (Aβ) and neurofibrillary tangles (phosphorylated Tau) are stained.

BF-188

Senile plaque/neurofibrillary tangle dual target probe

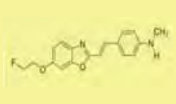
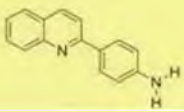
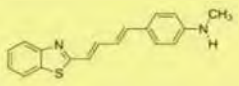
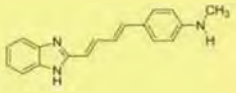
Arrows (→): Senile plaques (Aβ)
Arrowheads (▽): Neurofibrillary tangles (phosphorylated Tau)



→ Senile plaques (Aβ) and neurofibrillary tangles (phosphorylated Tau) are stained in different colors.

(Data provided by Drs. Harada & Kudo, Institute of Development, Aging and Cancer, Tohoku Univ.)

Product information

	BF-168	BF-170	BF-187	BF-188
Summary	Senile plaque (Aβ)-selective	Neurofibrillary tangle change (pTau)-selective	Stains senile plaque (Aβ) & neurofibrillary tangle change (pTau)	Stains senile plaque (Aβ) and neurofibrillary tangle change (pTau), respectively with different colors.
Senile plaque (Aβ)	○ (Blue)	×	○ (green)	○ (green)
Neurofibrillary tangle change (pTau)	×	○ (green)	○ (green)	○ (yellow, red)
Excitation wavelength	380-420 nm	450-490 nm	400-440 nm	400-440 nm
Fluorescence wavelength	450 nm	520 nm	540 nm	380-420 nm (Senile plaque) 510-560 nm (Neurofibrillary tangle
Chemical Structure				
References	1) Okamura, N., *et al.*: Quinoline and benzimidazole derivatives: candidate probes for in vivo imaging of tau pathology in Alzheimer's disease, *J. Neurosci.*, **25**, 10857-10862 (2005). 2) Kuwabara, Y., *et al.*: Impairments of long-term depression induction and motor coordination precede Aβ accumulation in the cerebellum of APPswe/PS1dE9 double transgenic mice, *J. Neurochem.*, **130** (3), 432-443 (2014).			1) Harada, R, *et al.*: Use of benzimidazole derivative BF-188 in fluorescence multispectral imaging for selective visualization of Tau protein fibrils in the Alzheimer's disease brain, *Molecular Imaging and Biology*, **16** (1), 19-27, 2014.

Product Name	Wako Cat. No.	Package Size*	Grade	Storage Condition
BF-168	029-16361	1 mg	for Cellbiology	Keep at -20°C.
BF-170	026-16371	1 mg		
BF-187	022-18811	1 mg		
BF-188	025-18801	1 mg		

*: 1mg corresponds to abt. 100 slides

3. ELISA Kits

For the quantitative determination of Aβ40 and Aβ42 for research of Alzheimer's disease

β-Amyloid ELISA Kits

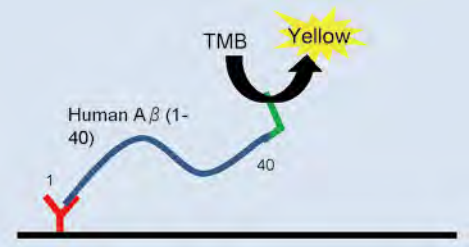
Alzheimer's Disease (AD) is characterized by the presence of extracellular senile plaques (SPs) and intracellular neurofibrillary tangles (NFT) in the brain. The major protein component of SPs is β Amyloid peptide (Aβ) 40 and 42(43). Aβ42 is more prone to aggregate than Aβ40. Therefore the initial Aβ deposition begins with Aβ42(43) but not with Aβ40.
Aβ42(43)-positive and Aβ40-negative plaques may represent early-stage diffuse type SPs, and Aβ40-positive plaque appears in the advanced stage, especially more often in the cored portion of the mature plaque.
In these kits, we use the monoclonal antibodies which specifically detects Aβ. Therefore these kits are designed to be used for the quantitative determination of Aβ in samples such as tissue culture medium, tissue homogenate, CSF and plasma.

Features

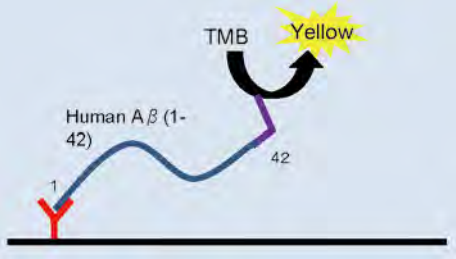
- These kits are designed to be used for the quantitative determination of Aβ in samples such as tissue culture medium, tissue homogenate, CSF and plasma.
- These kits use the monoclonal antibodies that were developed by Takeda Chemicals Industries, Ltd.

Principle

Determination of Human Aβ (1-40)



Determination of human Aβ (1-42)



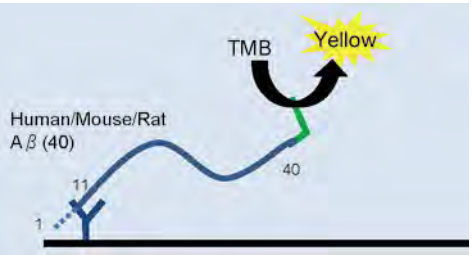
BAN50 : A specific antibody for Aβ N-terminus

BNT77 : A specific antibody for Aβ11-28

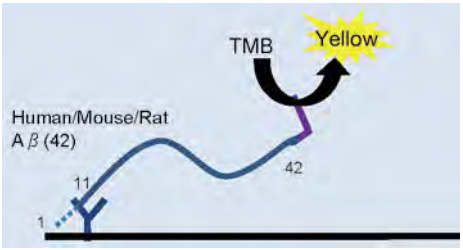
BA27 : A specific antibody for Aβ40 C-terminus (Fab' or F(ab')2)

BC05 : A specific antibody for Aβ42 C-terminus (Fab')

Determination of human/mouse/rat Aβ (40)*
*: Aβ(x-40) with a truncated or modified N-terminus



Determination of human/mouse/rat Aβ (42)*
*: Aβ(x-42) with a truncated or modified N-terminus



Kit variation

β Amyloid ELISA Kit Wako	**Uses Fab' fragment antibodies for reduced nonspecific binding.**
β Amyloid ELISA Kit Wako II	Uses F(ab')2 fragment antibodies for increased stability of antigen-antibody reaction.
β Amyloid ELISA Kit Wako, High Sensitive	Approx. 10 times more sensitive than conventional products. Uses Fab' fragment antibodies for reduced nonspecific binding.

- Sample: tissue extract, culture supernatant, cerebrospinal fluid, plasma
- Measurement time: Overnight + 1.5hr
- Required sample volume: 100 µL
- Storage condition: Keep at 2-10°C.

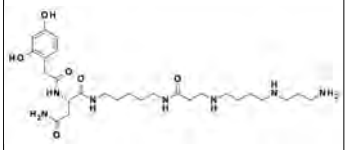
References on β Amyloid:

1) Griciuc, A., *et al.*: Alzheimer's disease risk gene CD33 inhibits microglial uptake of amyloid beta, *Neuron.*, **78** (4), 631-643 (2013).
2) Wei, W., *et al.*: Amyloid beta from axons and dendrites reduces local spine number and plasticity, *Nat Neurosc.*, **13** (2), 190-196 (2010).

Measured factor	Product Name	Sensitivity (pM)	Std. curve range (pM)	Wako Cat. No.	Package Size
Human Aβ(1-40)	Human β Amyloid (1-40) ELISA Kit *Wako*	0.12	1.0~100	292-62301	96 tests
	Human β Amyloid (1-40) ELISA Kit *Wako* II	0.019		298-64601	
Human Aβ(1-42)	Human β Amyloid (1-42) ELISA Kit *Wako*	0.08		298-62401	
	Human β Amyloid (1-42) ELISA Kit *Wako*, High Sensitive	0.06	0.1~20.0	296-64401	
Human/mouse/rat Aβ(40)	Human/Rat β Amyloid (40) ELISA Kit *Wako*	0.25	1.0~100	294-62501	
	Human/Rat β Amyloid (40) ELISA Kit *Wako* II	0.049		294-64701	
Human/mouse/rat Aβ(42)	Human/Rat β Amyloid (42) ELISA Kit *Wako*	0.19		290-62601	
	Human/Rat β Amyloid (42) ELISA Kit *Wako*, High Sensitive	0.024	0.1~20.0	292-64501	

AMPA-type glutamate receptor

Product Name	Wako Cat. No.	Pkg. Size
Joro Spider Toxin JSTX-3 for Biochemistry	104-00051	0.1 mg

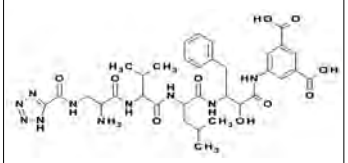


CAS No. 112163-33-4
$C_{27}H_{47}N_7O_6$ = 565.71

[Solubility] Water
[Storage condition] Keep at 2-10°C.
[Reference] Iino, M. *et al.*: *J. Physiol.*, **496**, 431 (1996).
[Summary] AMPA receptor antagonist.
IC_{50} = 56 nmol/L

β-secretase inhibitors

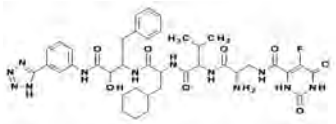
Product Name	Wako Cat. No.	Pkg. Size
KMI-429 for Cellbiology	115-00901	1 mg



CAS No. 753030-13-6
$C_{34}H_{44}N_{10}O_{10}$ = 752.77

[Solubility] Methanol (0.5 mg/mL)
[Storage condition] Keep at -20°C.
[Reference] Hamada, Y. *et al.*: *Bioorg. Med. Chem. Lett.*, **18**, 1649 (2008).
[Summary] β-Secretase (BACE1) inhibitor. A peptidic inhibitor based on the model amino acid sequence located around the cleavage site of the 'amyloid precursor protein (APP) with Swedish mutation,' discovered in familial Alzheimer's disease patients.
IC_{50} = 3.9 nmol/L (*in vitro*)

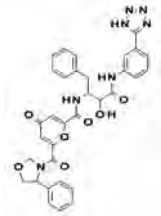
Product Name	Wako Cat. No.	Pkg. Size
KMI-574 for Cellbiology	112-00911	1 mg



CAS No. 753030-74-9
$C_{39}H_{49}FN_{12}O_8$ = 832.88

[Solubility] Methanol (1 mg/mL)
[Storage condition] Keep at -20°C.
[Reference] Hamada, Y. *et al.*: *Bioorg. Med. Chem. Lett.*, **18**, 1649 (2008).
[Summary] β-Secretase inhibitor with enhanced permeability across cell membranes compared to KMI-429.
IC_{50} = 5.6 nmol/L (*in vitro*)

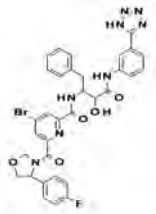
Product Name	Wako Cat. No.	Pkg. Size
KMI-1027 for Cellbiology	119-00921	1 mg



CAS No. 1022893-09-9
$C_{33}H_{29}N_7O_7$ = 635.63

[Solubility] Methanol (0.5 mg/mL)
[Storage condition] Keep at -20°C.
[Reference] Hamada, Y. *et al.*: *Bioorg. Med. Chem. Lett.*, **18**, 1654 (2008).
[Summary] Non-peptidic β-secretase inhibitor developed to have lower molecular weight for increased in vivo enzymatic stability and permeability across the blood-brain barrier.
IC_{50} = 50 nmol/L (*in vitro*)

Product Name	Wako Cat. No.	Pkg. Size
KMI-1303 for Cellbiology	116-00931	1 mg

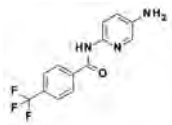


CAS No. 1160850-89-4
$C_{33}H_{28}BrFN_8O_5$

[Solubility] Methanol (0.5 mg/mL)
[Storage condition] Keep at-20°C.
[Reference] Hamada, Y. *et al.*: *Bioorg. Med. Chem. Lett.*, **19**, 2435 (2009).
[Summary] Non-peptidic β-secretase inhibitor produced from KMI-1027 by incorporating a halogen molecule for increased affinity to the active site pocket of β-secretase.
IC_{50} = 9 nmol/L (*in vitro*)

Cyclooxygenase-1 inhibitor

Product Name	Wako Cat. No.	Pkg. Size
TFAP for Cellbiology	205-17381	10 mg

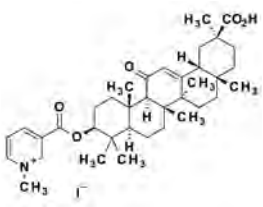


$C_{13}H_{10}F_3N_3O$ = 281.23

[Solubility] Ethanol (1 mg/mL)
[Storage condition] Keep at -20°C.
[Reference] Kakuta, H. *et al.*: *J. Med. Chem.*, **51**, 2400 (2008).
[Summary] COX-1 inhibitor. Causes minimal gastrointestinal damage even at high doses while exerting a stronger sedative effect than aspirin when administered orally to rats.
IC_{50} = 0.80 μmol/L (COX-1); 210 μmol/L (COX-2)

Gap junction

Product Name	Wako Cat. No.	Pkg. Size
INI-0602 for Cellbiology	097-06511	1 mg
	093-06513	5 mg



CAS No. 1204185-14-7
$C_{37}H_{52}INO_5$ = 717.72

[Assay] 98.0+ % (HPLC)
[Solubility] Methanol (1 mg/mL)
[Storage condition] Keep at -20°C.
[Reference] Takeuchi, H. *et al.*: *PLoS ONE*, **6**, e21108(2011).
[Summary] Gap junction hemichannel blocker with a capability to enter into the central nervous system. Specifically inhibits microglial glutamate release. Reported to reduce symptoms in mouse models of ALS (amyotrophic lateral sclerosis) and Alzheimer's disease.
IC_{50} = 7.38 μmol/L (*in vitro*)

D. Parkinson's Disease

1. Synucleins

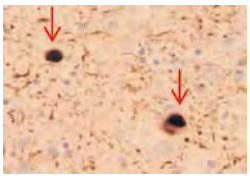
Lewy body marker antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
015-25191	**Anti Phosphorylated α-Synuclein, Monoclonal Antibody (pSyn#64)**	for Immunochemistry	50 µL	Keep at -20°C.

Antibody information

Antigen	α-synuclein pSer129	Application	WB, IHC, ICC	Isotype	IgG
Antigen information	Amino acid residue (124-134) of human α-synuclein with phosphorylated serine at position 129	Species cross reactivity	Human, mouse, rat	Label	Unlabeled
Antigen synonyms*	SNCA, PARK1, PARK4, NACP, PD1 *Alias of α-synuclein	Host	Mouse	Clone No.	pSyn#64
Summary	Lewy body, a substance specifically found in nerve cells affected with Parkinson's disease or dementia with Lewy body (DLB), contains α-synuclein protein of which serine at 129th position is specifically phosphorylated. This antibody does not react with normal α-synuclein, but recognizes only accumulated phosphorylated α-synuclein. This antibody is available for research in the Lewy body-related pathology.				
References	1) Fujiwara. H., *et al*,.: *Nature Cell Biology*, **4**, 160 (2002). 2) Saito. Y,.: *Journal of Neuropathology and Experimental Neurology*, **62**, 644 (2003).				

Immunostaining image: Brain sections of dementia with Lewy bodies



Data provided: Courtesy of T. Iwatsubo at Graduate School of Medicine and Faculty of Medicine, The University of Tokyo

Biotin-conjugated lewy body marker antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
010-26481	**Anti Phosphorylated α-Synuclein, Monoclonal Antibody (pSyn#64), Biotin-conjugated**	for Immunochemistry	100 µL	Keep at 2-10°C.

Antibody information

Antigen	α-synuclein pS129	Application	IHC/ICC	Isotype	IgG
Antigen information	Amino acid residue (124-134) of human α-synuclein with phosphorylated serine at position 129	Species cross reactivity	Human, mouse, rat	Label	Biotin
Antigen synonyms*	SNCA, PARK1, PARK4, NACP, PD1 *Alias of α-synuclein	Host	Mouse	Clone No.	pSyn#64
Summary	This is an biotin-conjugated antibody of above Anti Phosphorylated α-Synuclein, Monoclonal Antibody (pSyn#64) (Wako Cat. No. 015-25191).				

Image of immunohistological stain, brain section of Mouse

Data provided: Courtesy of Kuwabara and Iwatsubo at Graduate School of Medicine and Faculty of Medicine, The University of Tokyo

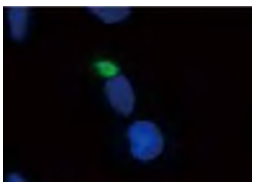
FITC-conjugated Lewy body marker antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
017-26491	**Anti Phosphorylated α-Synuclein, Monoclonal Antibody (pSyn#64), FITC-conjugated**	for Immunochemistry	100 µL	Keep at 2-10°C.

Antibody information

Antigen	α-synuclein pS129	Application	IHC/ICC	Isotype	IgG
Antigen information	Amino acid residue (124-134) of human α-synuclein with phosphorylated serine at position 129	Species cross reactivity	Human, mouse, rat	Label	FITC
Antigen synonyms*	SNCA, PARK1, PARK4, NACP, PD1 *Alias of α-synuclein	Host	Mouse	Clone No.	pSyn#64
Summary	This is a FITC-conjugated antibody of above anti Phosphorylated α-Synuclein, Monoclonal Antibody (pSyn#64) (Wako Cat. No. 015-25191)				

Image of immunocytological stain, human culture cells (SH-SY5Y)



Blue: DAPI (nucleus)
Green: Phosphorylated α-synuclein
Data provided: Courtesy of T. Iwatsubo at Graduate School of Medicine and Faculty of Medicine, The University of Tokyo

Synucleins

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	Product outline
190-17941	**α-Synuclein, Human, recombinant**	for Cellbiology	0.5 mg	Keep at -20°C.	•Appearance: Lyophilized •Storage buffer before lyophilization: 20 mmol/L Ammonium Bicarbonate •Host: *Escherichia coli* •Solubility: 2.5 mg/mL (20 mmol/L Ammonium Bicarbonate); 2.5 mg/mL (10 mmol/L Phosphate buffer (pH 7.4), 50 mmol/L NaCl) •Note: 6 × His-tagged
197-17951	**β-Synuclein, Human, recombinant**		0.5 mg		
194-17961	**γ-Synuclein, Human, recombinant**		0.5 mg		

E. Antibodies

1. Microglia Marker

Iba1 Antibodies

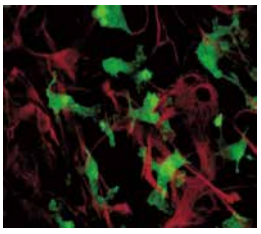
Microglia marker antibody (for immunostaining)

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
019-19741	**Anti Iba1, Rabbit (for Immunocytochemistry)**	for Immunochemistry	50 µg	Keep at -20°C.

Antibody information

Antigen	Iba1	Application	IHC/ICC	Isotype	IgG
Antigen information	A synthetic peptide corresponding to C-terminus of Iba1	Species cross reactivity	Human, mouse, rat	Label	Unlabeled
Antigen synonyms	AIF-1, IRT1, Protein G1	Host	Rabbit	Clone No.	- (polyclonal)
Summary	Iba1 is a calcium-binding protein with a molecular weight of 17,000 specifically expressed in macrophage/microglia. Microglia has attracted attentions because in addition to its role in neurotrophic effects/neuroprotective actions, neurological damage effect by production of NO, TNF-α, and IL-1β have been also proved. Since this product is a rabbit polyclonal antibody that specifically reacts with microglia, it is appropriate for a double stain with anti-GFAP monoclonal antibody specific to astrocytes, for example.				
References	1) Ito, D., Imai, Y., Ohsawa, K., Nakajima, K., Fukuuchi, Y. and Kohsaka, S.: *Brain Res.Mol. Brain Res.*, **57**, 1 (1998). 2) Kanazawa, H., Ohsawa, K., Sasaki, Y., Kohsaka, S. and Imai, Y.: *J. Biol. Chem.*, **277**, 20026 (2002).				

Image of a double stain in rat primary mixed culture cells
Green: Iba1 (microglia)
Red: GFAP (astrocyte)



Data provided: Courtesy of Kosaka and Osawa, Dept. of Neurochemistry, National Institute of Neuroscience, NCNP

Biotin-labeled Iba1 antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
016-26461	**Anti Iba1, Rabbit, Biotin-conjugated**	for Immunochemistry	100µL	Keep at 2-10°C.

Antibody information

Antigen	Iba1	Application	IHC/ICC	Isotype	IgG
Antigen information	A synthetic peptide corresponding to C-terminus of Iba1	Species cross reactivity	human, mouse, rat	Label	Biotin
Antigen synonyms	AIF-1, IRT1, Protein G1	Host	Rabbit	Clone No.	- (polyclonal)
Summary	This product is Anti Iba1, Rabbit (for Immunocytochemistry) (Wako Cat. No. 019-19741) labeled with biotin				

Image of immunohistological stain
-Rat brain cortical slice-

Brown: Iba1 (microglia)
Data provided: Courtesy of Sanagi, Ichinoe, Kosaka, Dept. of Ultrastructural Res., National Institute of Neuroscience, NCNP

FITC-labeled Iba1 antibody (coming soon)

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
012-26561	**Anti Iba1, Rabbit, FITC-conjugated**	for Immunochemistry	100 µL	Keep at 2-10°C.

Red fluorochrome conjugated Iba1 antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
013-26471	**Anti Iba1, Rabbit, Red Fluorochrome (635)-conjugated**	for Immunochemistry	100 µL	Keep at 2-10°C.

Antibody information

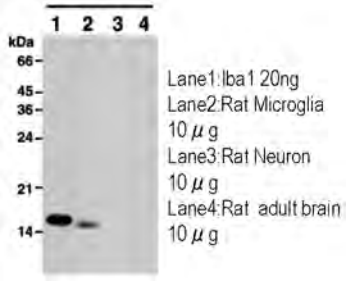
Antigen	Iba1	Application	IHC/ICC	Isotype	IgG
Antigen information	A synthetic peptide corresponding to C-terminus of Iba1	Species cross reactivity	Human, mouse, rat	Label	Red fluorochrome (Ex=634nm, Emi=654nm)
Antigen synonyms	AIF-1, IRT1, Protein G1	Host	Rabbit	Clone No.	- (polyclonal)
Summary	Iba1 is a protein highly expressed in microglia and macrophage with a molecular weight of about 16.7kDa. The protein is a commonly known microglial marker in the nervous sysytem. This item is Anti Iba1, Rabbit (for Immunocytochemistry)(Wako Cat. No.019-19741) labeled with a Red Fluorochrome (635) like Cy5™.				

Image of immunohistological stain
-Rat brain cortical slice-

Purple: Iba1 (microglia)
Data provided: Courtesy of Sanagi, Ichinoe, Kosaka, Dept. of Ultrastructural Res., National Institute of Neuroscience, NCNP

Microglia marker antibody (for western blotting)						
Wako Cat. No.	**Product Name**			**Grade**	**Pkg. Size**	**Storage Condition**
016-20001	**Anti Iba1, Rabbit (for Western Blotting)**			for Immunochemistry	50 µg	Keep at -20°C.
Antibody information						
Antigen	Iba1	Application	WB	Isotype	IgG	
Antigen information	A synthetic peptide corresponding to C-terminus of Iba1	Species cross reactivity	Human, mouse, rat	Label	Unlabeled	
Antigen synonyms	AIF1, IRT1, Protein G1	Host	Rabbit	Clone No.	- (polyclonal)	
Summary	Iba1 is a calcium-binding protein with a molecular weight of 17,000 specifically expressed in macrophage/microglia. Microglia has attracted attentions because in addition to its role in neurotrophic effects/neuroprotective actions, neurological damage effect by production of NO, TNF-α, and IL-1β have been also proved. Since this product is a rabbit polyclonal antibody that specifically reacts with microglia, it is appropriate for western blotting.					
References	1) Ito, D., Imai, Y., Ohsawa, K., Nakajima, K., Fukuuchi, Y. and Kohsaka, S.: *Brain Res. Mol. Brain Res.*, **57**, 1 (1998). 2) Kanazawa, H., Ohsawa, K., Sasaki, Y., Kohsaka, S. and Imai, Y. : *J. Biol. Chem.*, **277**, 20026 (2002).					

WB image



Data provided: Courtesy of Department of Neurochemistry, National Center of Neurology and Psychiatry

Reference on Anti Iba1: Griciuc, A., *et al*.: Alzheimer's disease risk gene CD33 inhibits microglial uptake of amyloid beta, *Neuron*, **78** (4), 631-643 (2013).

2. Tau proteins

Research for Alzheimer's Disease (coming soon)		
Wako Cat. No.	**Product Name**	**Pkg. Size**
016-26581	**Anti 3R-Tau, Rat Monoclonal Antibody (2A1-1F4)**	50 µL
013-26591	**Anti 4R-Tau, Monoclonal Antibody (3E8-1A6)**	50 µL
016-26601	**Anti Phosphorylated Tau T181, Rat Monoclonal Antibody (2E2-A6)**	50 µL
013-26611	**Anti Phosphorylated Tau S199, Rat Monoclonal Antibody (5B8-1E2)**	50 µL

Please see the page No.10 for the detailed information.

3. Synucleins

Research for Parkinson's Disease		
Wako Cat. No.	**Product Name**	**Pkg. Size**
015-25191	**Anti Phosphorylated α-Synuclein, Monoclonal Antibody (pSyn#64)**	50 µL
010-26481	**Anti Phosphorylated α-Synuclein, Monoclonal Antibody (pSyn#64), Biotin-conjugated**	100 µL
017-26491	**Anti Phosphorylated α-Synuclein, Monoclonal Antibody (pSyn#64), FITC-conjugated**	100 µL

Please see the page No.15 for the detailed information.

4. Brain Tumor

IDH2 antibody: Glioma related factors					
Wako Cat. No.	**Product Name**		**Grade**	**Pkg. Size**	**Storage Condition**
011-24071	**Anti IDH2, Monoclonal Antibody**		for Immunochemistry	100 µg	Keep at -20°C.
Antibody information					
Antigen	IDH2	Application	WB/IHC/ELISA	Isotype	IgG2b
Antigen information	Human IDH2 peptide	Species cross reactivity	Human, mouse, hamster	Label	Unlabeled
Antigen synonyms	ICD-M, IDPM, IDHM, D2HGA2	Host	Mouse	Clone No.	RMab-22
Summary	IDH (Isocitrate dehydrogenases) is a redox enzyme that mutual conversion between isocitrate and α-ketoglutarate. IDH exists in three isoforms in mammal: IDH1 (cytoplasm. $NADH^+$ dependent), IDH2 (mitochondrial. $NADH^+$ dependent) and IDH3 (mitochondrial. NAD^+ dependent). While IDH1 is an enzyme involved in the TCA cycle, a place for energy production, many mutations have been discovered on the IDH1/2 genes in glioma, such as astrocytomas, oligodendroglioma and oligoastrocytoma in recent years. IDH1/2 has been reported to be deeply involved in development of glioma. This product is a monoclonal antibody that recognizes the IDH2.				

IDH1 mutation (R132H) specific antibody: Glioma related factors

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
018-24081	**Anti IDH1-R132H, Monoclonal Antibody**	for Immunochemistry	100 µg	Keep at -20°C.

Antibody information					
Antigen	IDH1 R132H	Application	WB/IHC/ELISA	Isotype	IgG1
Antigen information	Human IDH1 R132H peptide	Species cross reactivity	-	Label	Unlabeled
Antigen synonyms	See IDH1 antibody	Host	Mouse	Clone No.	HMab-1
Summary	IDH (Isocitrate dehydrogenases) is a redox enzyme that mutual conversion between isocitrate and α-ketoglutarate. IDH exists in three isoforms in mammal: IDH1 (cytoplasm. $NADH^+$ dependent), IDH2 (mitochondrial. $NADH^+$ dependent) and IDH3 (mitochondrial. NAD^+ dependent). While IDH1 is an enzyme involved in the TCA cycle, a place for energy production, many mutations have been discovered on the IDH1/2 genes in glioma, such as astrocytomas, oligodendroglioma and oligoastrocytoma in recent years. IDH1/2 has been reported to be deeply involved in development of glioma. This product is a monoclonal antibody that recognizes the IDH1-R132H, which is a mutated form of human IDH1.				
References	Takano, S., *et al*.: *Brain Tumor Pathol*., **28**, 115 (2011).				

IDH1 mutation (R132S) specific antibody: Glioma related factors

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
015-24091	**Anti IDH1-R132S, Monoclonal Antibody**	for Immunochemistry	100 µg	Keep at -20°C.

Antibody information					
Antigen	IDH1 R132S	Application	WB/IHC/ELISA	Isotype	IgG1
Antigen information	Human IDH1 R132S peptide	Species cross reactivity	-	Label	Unlabeled
Antigen synonyms	See IDH1 antibody	Host	Mouse	Clone No.	SMab-1
Summary	IDH (Isocitrate dehydrogenases) is a redox enzyme that mutual conversion between isocitrate and α-ketoglutarate. IDH exists in three isoforms in mammal: IDH1 (cytoplasm. $NADH^+$ dependent), IDH2 (mitochondrial. $NADH^+$ dependent) and IDH3 (mitochondrial. NAD^+ dependent). While IDH1 is an enzyme involved in the TCA cycle, a place for energy production, many mutations have been discovered on the IDH1/2 genes in glioma, such as astrocytomas, oligodendroglioma and oligoastrocytoma in recent years. IDH1/2 has been reported to be deeply involved in development of glioma. This product is a monoclonal antibody that recognizes the IDH1-R132S, which is a mutated form of human IDH1.				
References	Kaneko, M. K. *et al*.: *Biochem. Biophys. Res. Commun*., **406**, 608 (2011).				

Podoplanin antibody (Human): Brain tumor related factors

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
018-24101	**Anti Human Podoplanin, Monoclonal Antibody**	for Immunochemistry	100 µg	Keep at -20°C.

Antibody information					
Antigen	Podoplanin	Application	WB/IP/FC/IHC/ELISA	Isotype	IgG2a
Antigen information	Human Podoplanin	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	PDPN, GP36, T1-alpha, Aggrus, OTS8	Host	Rat	Clone No.	NZ-1.2
Summary	Podoplanin is a type I transmembrane protein and has platelet aggregation and metastasis promoting activity. The N -terminus is extracellular domain and contains a PLAG domain, which is involved in platelet aggregation activity. Podoplanin has attracted an attention as a marker of lymphatic vessel because it is expressed in the lymphatic endothelial cells but not vascular endothelial cells. In addition, podoplanin has been increasingly used as a tumor marker due to a positive correlation of its expression with degree of malignancy in various tumors. In the brain tumor, podoplanin expression level has been reported to be elevated in accordance with degree of malignancy. This product is an antibody that recognizes the PLAG domain of human podoppnin, and detects podoplanin as a marker protein in tumor and lymphatic vessels. This product can be also used in suppression of platelet aggregation activity.				
References	Kaji, C., *et al*.: *Acta. Histochem. Cytochem*. **45**, 227, (2012).				

Podoplanin antibody (Mouse): Brain tumor related factors

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
015-24111	**Anti Mouse Podoplanin, Monoclonal Antibody**	for Immunochemistry	100 µg	Keep at -20°C.

Antibody information					
Antigen	Podoplanin	Application	WB/IP/IHC/FC/ELISA	Isotype	IgG2a
Antigen information	Mouse Podoplanin	Species cross reactivity	Mouse	Label	Unlabeled
Antigen synonyms	Refer to Human podoplanin antibody.	Host	Rat	Clone No.	PMab-1
Summary	Podoplanin is a type I transmembrane protein and has platelet aggregation and metastasis promoting activity. The N -terminus is extracellular domain and contains a PLAG domain, which is involved in platelet aggregation activity. Podoplanin has attracted an attention as a marker of lymphatic vessel because it is expressed in the lymphatic endothelial cells but not vascular endothelial cells. In addition, podoplanin has been increasingly used as a tumor marker due to a positive correlation of its expression with degree of malignancy in various tumors. In the brain tumor, podoplanin expression level has been reported to be elevated in accordance with degree of malignancy. This product is an antibody that recognizes the PLAG domain of mouse podoppnin, and detects podoplanin as a marker protein in tumor and lymphatic vessels. This product can be also used in suppression of platelet aggregation activity.				
References	Kaji, C., *et al*.: *Acta. Histochem. Cytochem*. **45**, 227, (2012).				

5. Growth Cone Markers

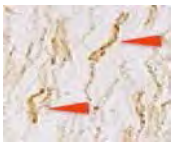
Highly specific growth cone marker antibody (for mouse and rat samples)

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
017-25391	**Anti Phosphorylated GAP-43 S96, Monoclonal Antibody (16-4C)**	for Immunochemistry	100 µL	Keep at -20°C

Antibody information

Antigen	GAP-43 pSer96	Application	WB/IHC	Isotype	IgG1
Antigen information	Amino acids residues (89- 101) of GAP-43 with phosphorylated serine at position 96 (CDAAPATpSPKAEE)	Species cross reactivity	Mouse, rat ※The antibody does not react to human or monkey sampl	Label	Unlabeled
Antigen synonyms*	Growth Associated Protein 43, neuromodulin, B-50, pp47 ※Alias of GAP-43	Host	Mouse	Clone No.	16-4C
Summary	GAP-43 (growth associated protein 43) is a factor highly expressed in regenerating neuron. Growth cone, a site formed at axonal terminals of regenerating neuron, has highly phosphorylated serine at position 96. This product recognizes GAP-43 having this phosphorylated amino acid residue, and is useful for specific identification and staining of regenerating nerve circuit.				

Image of immunostaining (injured rat sciatic nerve)



Data provided: Courtesy of K. Takeuchi at Department of Medicine, Aichi Medical University; A. Kawasaki, M. Okada, and M. Igarashi at School of Medicine, Niigata University

Highly specific growth cone marker antibody (for mouse and rat samples)

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
010-25401	**Anti Phosphorylated GAP-43 S96, Monoclonal Antibody (18-10H-9H)**	for Immunochemistry	100 µL	Keep at -20°C.

Antibody information

Antigen	GAP-43 pSer96	Application	WB/IHC	Isotype	IgG1
Antigen information	Amino acids residues (89-101) of GAP-43 with phosphorylated serine at position 96 (CDAAPATpSPKAEE)	Species cross reactivity	Mouse, rat ※The antibody does not react to human or monkey sample	Label	Unlabeled
Antigen synonyms*	Growth Associated Protein 43, neuromodulin, B-50, pp47 ※Alias of GAP-43	Host	Mouse	Clone No.	18-10H-9H
Summary	GAP-43 (growth associated protein 43) is a factor highly expressed in regenerating neuron. Growth cone, a site formed at axonal terminals of regenerating neuron, has highly phosphorylated serine at position 96. This product recognizes GAP-43 having this phosphorylated amino acid residue, and is useful for specific identification and staining of regenerating nerve circuit.				
References	Kanekiyo, K., *et al*.: *Restor. Neurol. Neurosci*., in Press (2016).				

Image of immunostaining (Mouse spinal marrow 7 days after injury)

Data provided: Courtesy of K. Takeuchi at Department of Medicine, Aichi Medical University; A. Kawasaki, M. Okada, and M. Igarashi at School of Medicine, Niigata University

Highly specific growth cone marker antibody (for immunostaining of human, mouse and rat samples)

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
017-25411	**Anti Phosphorylated GAP-43 T172, Monoclonal Antibody (19-9A)**	for Immunochemistry	100 µL	Keep at -20°C.

Antibody information

Antigen	GAP-43 pThr172	Application	IHC	Isotype	IgG1
Antigen information	Amino acid residue (164-177) of GAP-43 with phosphorylated threonine at position 172 (CVTDAAATpTPAAED)	Species cross reactivity	Mouse , rat,	Label	Unlabeled
Antigen synonyms	Growth Associated Protein 43, neuromodulin, B-50, pp47 ※Alias of GAP-43	Host	Mouse	Clone No.	19-9A
Summary	GAP-43 (growth associated protein 43) is a factor highly expressed in regenerating neuron. Growth cone, a site formed at axonal terminals of regenerating neuron, has highly phosphorylated threonine at position 172. This product recognizes GAP-43 having this phosphorylated amino acid residue, and is useful for specific identification and staining of regenerating nerve circuit.				

Image of immunostaining (Mouse spinal marrow 7 days after injury)

Data provided: Courtesy of K. Takeuchi at Department of Medicine, Aichi Medical University; A. Kawasaki, M. Okada, and M. Igarashi at School of Medicine, Niigata University

References on growth cone markers:
1) Motohiro, N., *et al*.: Identification of functional marker proteins in the mammalian growth cone, *PNAS*, **16** (40), 17211-17216 (2009).
2) Oyamatsu, H., *et al*.: Morphological assessment of early axonal regeneration in end-to-side nerve coaptation models, *J. Plast Surg Hand Surg*., **46** (5), 299-307 (2012).

6. 5HT Receptors

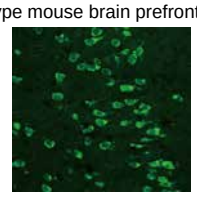
5-HT$_{1A}$ antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
016-25981	**Anti Mouse 5-HT$_{1A}$ Receptor, Rat Monoclonal Antibody (4A6)**	for Immunochemistry	50µL	Keep at -80°C.

Antibody information

Antigen	5-HT$_{1A}$ Receptor	Application	IHC, FC	Isotype	IgG1
Antigen information	5-HT$_{1A}$ Receptor gene information	Species cross reactivity	Mouse	Label	Unlabeled
Antigen synonyms	Serotonin Receptor 1A, HTR1A, SR-1A	Host	Rat	Clone No.	4A6
Summary	5-HT$_{1A}$ receptor is a G-protein coupled receptor activated by serotonin (5-HT). The receptors are found in central nerve system, and control sleep, food intake, body temperature and anxiety. A partial agonist of 5-HT$_{1A}$ receptor (tandospirone) is clinically used as an anti-anxiety agent. 5-HT$_{1A}$ receptor attracts attention for drug discovery. This product is a rat monoclonal antibody against native form mouse 5-HT$_{1A}$ receptor, established by DNA immunization.				

Image of immunohistological stain
Wild type mouse brain prefrontal area



Green: 5-HT$_{1A}$ Receptor

Data provided: Courtesy of Matsuda at Graduate School and School of Pharmaceutical Sciences, and Takuma and Dr.Hasebe at School and Graduate School of Dentistry, Osaka University

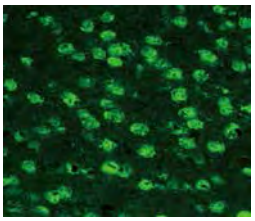
5-HT$_{2C}$ antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
013-25991	**Anti Mouse 5-HT$_{2C}$ Receptor, Rat Monoclonal Antibody (6D2)**	for Immunochemistry	50 µL	Keep at -20°C.

Antibody information

Antigen	5-HT$_{2C}$ Receptor	Application	IHC, FC	Isotype	IgG2a,k
Antigen information	5-HT$_{2C}$ receptor gene information	Species cross reactivity	Mouse	Label	Unlabeled
Antigen synonyms	Serotonin Receptor 2C, HTR2C, HTR1C, SR-2C	Host	Rat	Clone No.	6D2
Summary	5-HT$_{2C}$ receptor is a G-protein coupled receptor activated by serotonin. The receptors are mainly found in central nerve system, and are reported to involve in food intake, sexual function and social interaction. This product is an antibody against native form mouse 5-HT$_{2C}$ receptor, established by DNA immunization.				

Image of immunohistological stain
Wild type mouse brain prefrontal area



Green: 5-HT$_{2C}$ Receptor
Data provided: Courtesy of Matsuda at Graduate School and School of Pharmaceutical Sciences, and Takuma and Hasebe at School and Graduate School of Dentistry, Osaka University

Reference on 5HT receptors:
1) Inoue, M., *et al*, Innervation of holothurian body wall muscle: inhibitory effects and localization of 5-HT, *Zoolog. Sci.*, **19** (11), 1217-1222 (2002).

7. Neurodegenerative Disease

Neutralizing antibody for orphan ligand Apelin

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
013-25871	**Anti Apelin, Monoclonal Antibody (4G5)**	for Immunochemistry	100 µL	Keep at 2-10°C.

Antibody information

Antigen	Apelin	Application	ICC/ELISA/ Neutralization	Isotype	IgG1
Antigen information	pGlu65-Apelin13 (QRPRLSHKGPMPF)	Species cross reactivity	Human, mouse, rat	Label	Unlabeled
Antigen synonyms	APLN, APEL, XNPEP2, AGTRL1 Ligand	Host	Mouse	Clone No.	4G5
Summary	Apelin is a bioactive peptide ligand consisting of 36 amino acids. By activating the APJ receptor with binding to the APJ receptor, it shows blood pressure-lowering effect, angiogenic effect, and arteriosclerosis effect. Apelin also presents in the nervous system. In recent years, neuroprotective effects have been reported in ALS model mice. This product is an antibody against Apelin. It shows neutralizing activity by binding to the active site of Apelin.				
References	1) Kidoya H *et al*.: *EMBO J*. 2008 Feb 6; 27 (3) : 522-34 2) *Biochim Biophys Acta*. 2001 Apr 23; 1538 (2-3) : 162-71.				

Pain related factor P2X4 antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
016-23281	**Anti Rat P2X4, Monoclonal Antibody**	for Immunochemistry	50 µg	Keep at -20°C.

Antibody information

Antigen	P2X4	Application	WB/IHC	Isotype	IgG
Antigen information	Extracellular domain of Rat P2X4 protein	Species cross reactivity	Rat	Label	Unlabeled
Antigen synonyms	P2RX4, ATP Receptor, P2X4R	Host	Mouse	Clone No.	2A3
Summary	P2X4 is a transmembrane form of receptor that belongs to the ligand-gated ion channel family. P2X4 is expressed primarily in the central nervous system such as spinal cord and brain. P2X4 expression increases at the time of neuropathic pain. BDNF, which becomes nutrition of nerve cells, are released in large amount from microglia by the stimulation of P2X4. As a consequence, strong pain is induced. P2X4 has been reported to be involved in neuronal cell death induced by Alzheimer's disease related factors Aβ.				

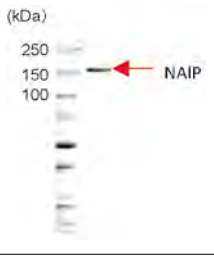
Apoptosis related factor NAIP antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
019-24251	**Anti Human NAIP, Rabbit**	for Immunochemistry	20 µL	Keep at -20°C.

Antibody information

Antigen	NAIP	Application	WB	Isotype	IgG
Antigen information	Human NAIP recombinant	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	MAP3K5, MEKK5, MAPKKK5, Apoptosis Signal Regulating Kinase 1	Host	Rabbit	Clone No.	- (Polyclonal)
Summary	Neuronal Apoptosis Inhibitory Protein(NAIP) is one of proteins that inhibit apoptosis. It is a member of Inhibitor of Apoptosis Proteins (IAP) family, and is reported to involve in selective inhibition of oxidative stress-induced cell death. Many reports suggest that NAIP is involved in etiology of several neurodegenerative diseases including Alzheimer's disease and multiple sclerosis. This product is an antibody that recognizes human NAIP.				

WB image



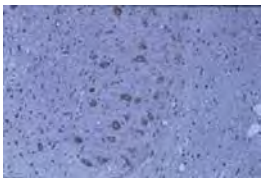
Autophagy related factor SQSTM1/A170/p62 antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
018-22141	**Anti SQSTM1/A170/p62, Rabbit**	for Immunochemistry	100 µL	Keep at -20°C.

Antibody information

Antigen	SQSTM1, A170, p62	Application	WB/IHC	Isotype	IgG
Antigen information	Mouse SQSTM1/A170/p62 PEST domain (T7 tag + amino acid 254-333 + His tag) recombinant	Species cross reactivity	Rat, mouse	Label	Unlabeled
Antigen synonyms	Sequestosome 1, OSIL, PDB3, ZIP3, EBIA, PORCA, p62B	Host	Rabbit	Clone No.	- (Polyclonal)
Summary	Sequestosome 1(SQSTM1)/A170(Mouse)/p62(human)/ZIP (Rat) is a ubiquitin binding protein and shows oxidative stress-dependent expression. Recently, it is reported that SQSTM1 binds to LC3, an autophagy related factor. It attracts attention because it may induce protein degradation from ubiquitin/proteosome system to autophagy system. In neurodegenerative diseases including Parkinson's disease, dysfunction of autophagy factor is implicated. This product is an antibody against SQSTM1/A170/p62 antibody.				
References	Ishii, T., *et al*.: *J. Biol. Chem*., **275**, 16023 (2000).				

Image of immunostaining (Rat basal ganglion)



Data provided: Courtesy of K. Nakaso at Faculty of Medicine, Tottori University

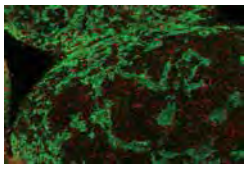
Glycoprotein tenascin-C antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
018-21781	**Anti Human Tenascin-C, Rat Monoclonal Antibody**	for Immunochemistry	100 µg	Keep at -80°C.

Antibody information

Antigen	Tenascin-C	Application	IHC	Isotype	IgG2a
Antigen information	Tenascin-C derived from supernatant of human melanoma culture cell (A375)	Species cross reactivity	Human, Mouse	Label	Unlabeled
Antigen synonyms	TNC, HXB, DFNA56, Neuronectin	Host	Rat	Clone No.	3-6C2
Summary	Tenascin-C is glycoprotein, a component of extracellular matrix, and found in interstitium of epithelium-mesenchyme at early stage of organogenesis period. Since symptomatic improvement was observed in tenascin-C deficient Alzheimer's model mice in recent years, tenascin-C has been focused on the potential as a therapeutic target for Alzheimer's disease. This product is an antibody that recognizes tenascin-C.				
References	Settles, D. L., *et al*.: *J. Neurosci. Res*., **47**, 109 (1997).				

Image of immunostaining (Tissue of human ovarian tumor transplanted on nude mouse)



Green: Tenascin-C
Red: nucleus

8. Neurogenesis

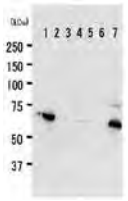
CRMP1 antibody: Neuronal development, Maturation factor

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
017-24811	**Anti CRMP1, Hamster Monoclonal Antibody (2E7G)**	for Immunochemistry	100 µL	Keep at 2-10°C.

Antibody information

Antigen	CRMP1	Application	WB/IP/ELISA	Isotype	IgG
Antigen information	Full length rat CRMP1 recombinant protein	Species cross reactivity	Human, mouse, rat, chicken	Label	Unlabeled
Antigen synonyms	DPYSL1, DRP1, ULIP3	Host	Hamster	Clone No.	2E7G
Summary	It is reported that CRMP1 is one of factors that mediates neuronal migration at axon. Also, a report indicate its increased expression in schizophrenia patients and decreased expression in lung cancer patients. The product is an antibody that recognizes CRMP1.				
References	1) Yamashita, N. *et al*.: *J. Neurosci*., **26** (51), 13357 (2006). 2) Yamashita, N. *et al*.: *J. Neurosci*., **27** (46), 12546 (2007).				

WB image



Lane1: CRMP1 overexpression HEK293T cell extract
Lane2: CRMP2
Lane3: CRMP3
Lane4: CRMP4
Lane5: CRMP5
Lane6: HEK293 cell extract
Lane7: Mouse brain cells

Data provided: Courtesy of N. Yamashita and Y. Goshima at School of Medicine, Yokohama City University

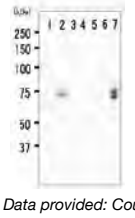
Neuronal development, Maturation factor CRMP2 antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
014-24821	**Anti CRMP2, Monoclonal Antibody (9F)**	for Immunochemistry	100 µL	Keep at 2-10°C.

Antibody information

Antigen	CRMP2	Application	WB/IHC/ICC/ ELISA	Isotype	IgG
Antigen information	C terminal sequence peptide of human CRMP2 (486-528 amino acids)	Species cross reactivity	Human, mouse, rat, chicken	Label	Unlabeled
Antigen synonyms	DPYSL2, DRP2, DHPRP2, ULIP2, N2A3	Host	Mouse	Clone No.	9F
Summary	CRMP2 is a factor involved in the extension of nerve axons, and has been reported to be phosphorylated by Cdk5 or GSK3β kinase. Since like Tau, highly phosphorylated CRMP2 is accumulated in neurofibrillary sites in the Alzheimer's disease model mouse, involvement of CRMP2 in Alzheimer's disease has been suggested. On the other hand, its expression is decreased in breast cancer tissue. This product is an antibody that specifically recognizes CRMP2.				
References	Higurashi M. *et al*.: *Mol Neurobiol*., **72** (12), 1528 (2012).				

WB image



Lane1: CRMP1 overexpression HEK293T cell extract
Lane2: CRMP2
Lane3: CRMP3
Lane4: CRMP4
Lane5: CRMP5
Lane6: HEK293 cell extract
Lane7: Mouse brain cells

Data provided: Courtesy of N. Yamashita, and Y. Goshima at School of Medicine, Yokohama City University

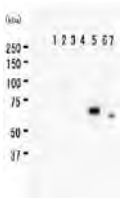
CRMP5 Antibody: Neuronal development, Maturation factor

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
011-24831	**Anti CRMP5, Monoclonal Antibody (KZ19)**	for Immunochemistry	100 µL	Keep at 2-10°C.

Antibody information

Antigen	CRMP5	Application	WB/IHC/ICC	Isotype	IgG
Antigen information	Full length mouse CRMP5recombinant protein	Species cross reactivity	Mouse, rat	Label	Unlabeled
Antigen synonyms	DPYSL5, CRAM, DRP5, ULIP6	Host	Mouse	Clone No.	KZ19
Summary	CRMP5 is involved in development, maintenance and synaptic plasticity of Purkinje cells. Also, it is reported to involve in etiology of subacute cerebellar ataxia and paraneoplastic syndrome. This product is an antibody that recognizes CRMP5.				
References	Yamashita, N. *et al*.: *J Neurosci*., **31** (5), 1773 (2011).				

WB image



Lane1: CRMP1 overexpression HEK293T cell extract
Lane2: CRMP2
Lane3: CRMP3
Lane4: CRMP4
Lane5: CRMP5
Lane6: HEK293 cell extract
Lane7: Mouse brain cells

Data provided: Courtesy of N. Yamashita and Y. Goshima at School of Medicine, Yokohama City University

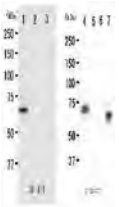
CRMP1/2 pS522 antibody: Neuronal development, Maturation factor

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
010-24801	**Anti Phosphorylated CRMP1/2 (Ser522), Rabbit**	for Immunochemistry	100 µL	Keep at 2-10°C.

Antibody information

Antigen	CRMP1 pS522 CRMP2 pS522	Application	WB/IHC/ELISA	Isotype	IgG
Antigen information	Rat CRMP2 amino acid peptide (516-528) with phosphorylated serine at amino acid 522 (ASSAKTpSPAKQQAC)	Species cross reactivity	Human, mouse, rat, chicken	Label	Unlabeled
Antigen synonyms	See CRMP1 and CRMP2 above	Host	Rabbit	Clone No.	- (Polyclonal)
Summary	CRMP2 is a factor involved in the extension of nerve axons, and has been reported to be phosphorylated by Cdk5 and GSK3β kinase. Since like Tau, highly phosphorylated CRMP2 is accumulated in neurofibrillary sites in the Alzheimer's disease model mouse, involvement of CRMP2 in Alzheimer's disease has been suggested. This product is an antibody that specifically recognizes CRMP1 and CRMP2 with phosphorylated S522.				
References	Uchida, Y., *et al*.: *Genes Cells*., **10** (2), 165 (2005).				

WB image



Lane1: CRMP1 overexpression HEK293T cell extract
Lane2: CRMP1-522A (unphosphorylated mutation)
Lane3: HEK293T cell extract
Lane4 : CRMP2 overexpression HEK293T cell extract
Lane5 : CRMP2-522A (unphosphorylated mutation)
Lane6 : HEK293T cell extract
Lane7 : Mouse brain cells

Data provided: Courtesy of N. Yamashita, and Y. Goshima at School of Medicine, Yokohama City University

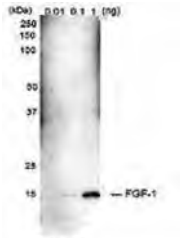
Growth factor FGF1 antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
010-24161	**Anti FGF1, Monoclonal Antibody (mAb1)**	for Immunochemistry	200 µg	Keep at 2-10°C.

Antibody information

Antigen	FGF1	Application	WB/ELISA	Isotype	IgG1
Antigen information	FGF1 extracted from bovine brain	Species cross reactivity	Human, mouse, rat, bovine	Label	Unlabeled
Antigen synonyms	FGFA, HBGF1, ECGF, aFGF	Host	Mouse	Clone No.	mAb1
Summary	FGF1 (Fibroblast Growth Factor 1, aFGF) is a non-glycosylated heparin-binding growth factor expressed in brain, kidney, retina, smooth muscle cells, bone matrix, osteoblasts, astrocytic cells and endothelial cells. It is involved in proliferation, differentiation and survival of a variety of tissues and cells. The product is an antibody that recognizes the FGF1, which has been reported to have a function as a neurotrophic factor in the nervous system.				
References	Yoneda, A., Asada, M., Oda, Y., Suzuki, M. and Imamura, T. : *Nat. Biotechnol*., **18**, 641 (2000).				

WB image (human FGF recombinant)



Exposure time: Standard 15 sec.

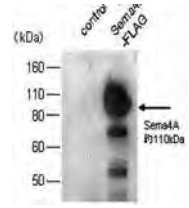
Semaphorin family Sema4A antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
019-22811	**Anti Mouse Sema4A, Monoclonal Antibody**	for Immunochemistry	100 µL	Keep at -20°C.

Antibody information

Antigen	Sema4A	Application	IHC/ICC/IP	Isotype	IgG
Antigen information	Mouse Sema4A-Fc fused protein recombinant	Species cross reactivity	Human, mouse	Label	Unlabeled
Antigen synonyms	SEMAB, Sema B, CORD10, RP35	Host	Mouse	Clone No.	1H9
Summary	Semaphorin family is a molecular group identified as an axonal guidance factor that defines orientation of axon during development. Sema4A is a member of Semaphorin family proteins. Since it has been reported that the blood concentration of Sema4A was elevated in patients with multiple sclerosis, Sema4A is believed to be involved in the pathogenesis. This product is an antibody that recognizes the Sema4A.				
References	1) Kumanogoh, A. *et al*.: *Immunity*, **22**, 305 (2005). 2) Okuno, T. *et al*.: *J.Immunol*., **184**, 1499 (2010).				

IP image
(Sema4A overexpression Cos-7 cell)



Data provided: Courtesy of A. Kumanogoh at Research Iinstitute for Microbial Diseases, Osaka University

9. PKA Activation Marker

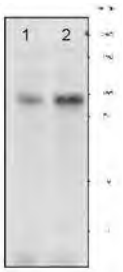
PKA kinase activity marker antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
019-26451	**Anti Phosphorylated Rap1gap S499, Monoclonal Antibody (8-8G-5A)**	for Immunochemistry	100 µL	Keep at -20°C.

Antibody information

Antigen	Rap1gap pS499	Application	WB	Isotype	IgG
Antigen information	Rap 1gap sequence peptide with phosphorylated S499	Species cross reactivity	Mouse, rat, human	Label	Unlabeled
Antigen synonyms	RAP1 GTPase Activating Protein RAP1GA1, RAPGAP ※Alias of Rap 1 gap	Host	Mouse	Clone No.	8-8G-5A
Summary	Rap 1gap is a regulator (GTPase activating protein) of Rap 1. It is known that serine residue at position 499 of Rap1 (S499) is phosphorylated specifically by PKA kinase. Thus, Rap 1 gap can be used as an indicator of activity of Protein A kinase. This product is a monoclonal antibody that specifically recognizes Rap1GAP having phosphorylated S499, and serves as a marker to detect activity of PKA kinase.				

WB image (mouse brain sample)



Lane1: Control
Lane2: Sample added with Forskorin (a PKA activator)

Data provided: Courtesy of Amano and Dr.Kaibuchi at Graduate School of Medicine, Nagoya University

10. Sensory Organ

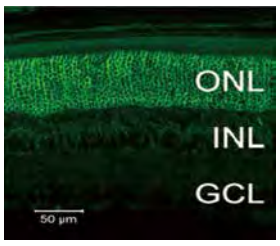
4.1G antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
018-26421	**Anti Mouse 4.1G/EPB41L2, Rabbit**	for Immunochemistry	50 µL	Keep at -20°C.

Antibody information

Antigen	4.1G EPB41L2	Application	WB/ICC	Isotype	IgG
Antigen information	Synthetic peptide TPRLRKRGKDPSENRGIC (57-73 a.a. of 4.1G/EPB41L2)	Species cross reactivity	Mouse	Label	Unlabeled
Antigen synonyms	Generally Expressed Protein 4.1 Erythrocyte Membrane Protein Band 4.1-Like 2	Host	Rabbit	Clone No.	- (Polyclonal)
Summary	4.1G (EPB41L2, Erythrocyte Membrane Protein Band 4.1-Like 2) is a scaffold protein of about 113kDa, a member of ERM family, and known to have function to maintain morphology of cell membrane. A recent research using KO mouse suggests its involvement in synapse location of optic nerve. This product is a rabbit polyclonal antibody that recognizes 4.1G protein.				
References	Sanuki, R., *et al*.: *Cell Reports*, **10**, 5, 796 (2015).				

Image of immunohistological stain



Green: 4.1G/EPB41L2

Data provided: Courtesy of Furukawa at Institute for Protein Research, Osaka University

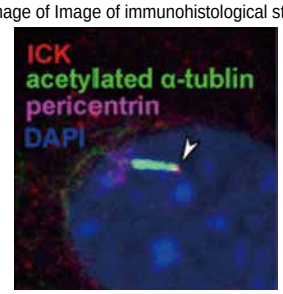
ICK antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
015-26431	**Anti Mouse ICK, Guinea Pig**	for Immunochemistry	50 µL	Keep at -20°C.

Antibody information

Antigen	ICK	Application	WB/ICC	Isotype	IgG
Antigen information	Synthetic peptide corresponding to 346-412 a. a. of ICK	Species cross reactivity	Mouse	Label	Unlabeled
Antigen synonyms	Intestinal Cell (MAK-Like) Kinase / MRK/LCK2	Host	Guinea pig	Clone No.	- (Polyclonal)
Summary	ICK (MRK, LCK2) is a kinase of about 71kDa. It localizes at the tip of cilia as a regulator of ciliary transport of protein, and is reported to affect ciliary formation.				
References	Chaya, T., *et al*.: *The EMBO Journal*, **33**,1227 (2014).				

Image of Image of immunohistological stain



Data provided: Courtesy of Furukawa at Institute for Protein Research, Osaka University

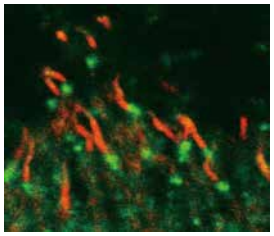
Mak antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
012-26441	**Anti Mouse Mak, Guinea Pig**	for Immunochemistry	50 µL	Keep at -20°C.

Antibody information

Antigen	Mak	Application	WB/ICC	Isotype	IgG
Antigen information	His-tagged C-terminal sequence (296-622 a.a.) of mouse Mak	Species cross reactivity	Mouse	Label	Unlabeled
Antigen synonyms	Male Germ Cell-Associated Kinase DJ417M14.2/RP62	Host	Guinea pig	Clone No.	- (Polyclonal)
Summary	Mak (DJ417M14.2) is a kinase of about 71kDa. It is reported that Mak is required for the long-term survival of photoreceptors, by regulating phosphorylation of a factor named RP1 to adjust ciliary elongation.				
References	Omori, Y., *et al*.: *Proc. Natl. Acad. Sci*. **107** , 22671 (2010).				

Image of Image of immunohistological stain



Red: Mak Green: γ-tubulin

Data provided: Courtesy of Furukawa at Institute for Protein Research, Osaka University

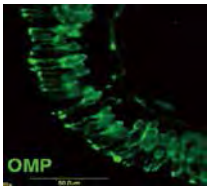
Matured olfactory nerve marker antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
019-22291 544-10001-WAKO*	**Anti Olfactory Marker Protein, Goat**	for Immunochemistry	100 µL	Keep at -20°C.

Antibody information

Antigen	Olfactory Marker Protein (OMP)	Application	WB/IHC	Isotype	IgG
Antigen information	Rodent OMP	Species cross reactivity	Human, mouse, Rat, marsupial, amphibia	Label	Unlabeled
Antigen synonyms	Olfactory Neuronal-Specific Protein	Host	Goat	Clone No.	- (Polyclonal)
Summary	Olfactory Marker Protein (OMP) is a soluble acid protein expressed on matured olfactory nerve. This product is a goat polyclonal antibody that specifically reacts to olfactory nerve and the nerve axon derived from several vertebrates including rodents, human, marsupial and amphibia.				
References	Koo, *et al*.: *J. Neurochem*, **90**, 102 (2004).				

Image of immunohistological stain (olfactory epithelium of matured rat)



Data provided: Courtesy of Dr.Frank L. Margolis and Jae Hyung Koo, School of Medicine, University of Maryland

*: Available for sale in the US only.

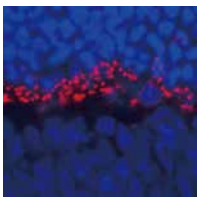
Ribon synaptic terminus matrix marker antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
011-22631	**Anti Mouse Pikachurin, Rabbit**	for Immunochemistry	50 µL	Keep at -20°C.

Antibody information

Antigen	Pikachurin	Application	WB/IHC	Isotype	IgG
Antigen information	N-terminal sequence (28-354 amino acids) of mouse pikachurin protein fused with GST	Species cross reactivity	Mouse, rat	Label	Unlabeled
Antigen synonyms	EGFLAM, AGRINL, AGRNL	Host	Rabbit	Clone No.	- (Polyclonal)
Summary	Pikachurin is an extracellular matrix protein involved in neurotransmission of vision, and found in ribbon synaptic terminus. It is implicated in dynamic vision of organisms, and binds to glycoprotein named dystroglycan. Also, pikachurin is essential for interaction between photorecepter and bipolar dendrite. This product is an antibody of pikachurin				
References	Omori. Y., *et al*.: *J Neurosci*., **32**, 6126, (2012).				

Image of immunostaining



Red: outer plexiform layer of mouse retina

Data provided: Courtesy of T. Furukawa at No. 4 Laboratory, Osaka Bioscience Institute

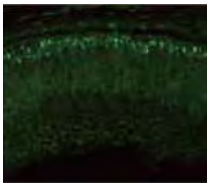
Retinal cone cell marker antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition
016-24261	**Anti Mouse Trβ2, Rabbit**	for Immunochemistry	50 µg	Keep at -20°C.

Antibody information

Antigen	Trβ2	Application	WB/IHC	Isotype	IgG
Antigen information	N-terminal sequence of Mouse Trβ2 (1-107 amino acid residue)	Species cross reactivity	Mouse	Label	Unlabeled
Antigen synonyms	THRB, ERBA2, PRTH, NR1A2, GRTH Thyroid Hormone Receptor Beta	Host	Rabbit	Clone No.	- (Polyclonal)
Summary	Trβ2 (thyroid hormone receptor Trβ2) is a high affinity receptor of triiodothyronine, and a member of a nuclear hormone receptor family and a NR1 subfamily. It is essential for development of green rod cells of retina in embryo, and also used as a cone cell marker. This product is an antibody against Trβ2.				
References	Sanuki, R, *et al*.: *Nature Neuroscience*, **14**,1125-1134 (2011).				

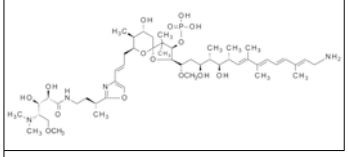
Image of immunostaining (mouse retina)



Data provided: Courtesy of T. Furukawa at No. 4 Laboratory, Osaka Bioscience Institute.

Toxins from marine organisms

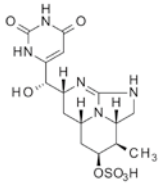
Product Name	Wako Cat. No.	Pkg. Size
Calyculin A for Biochemistry	038-14453	10 µg
	032-14451	100 µg



CAS No. 101932-71-2
$C_{50}H_{81}N_4O_{15}P$=1009.17
[Assay] 95.0+%(HPLC)
[Solubility] Methanol
[Storage condition] Keep at -20°C.
[Reference] Kato, Y. *et al*.: *J. Am. Chem. Soc*., **108**, 2780(1986).

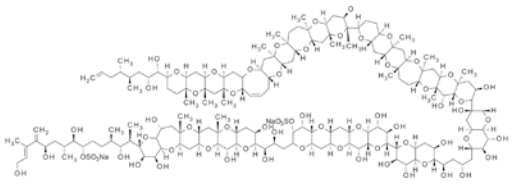
[Summary] Calyculin A induces smooth muscle contraction independent of extracellular calcium at approximately 100 times higher potency than okadaic acid. Calyculin A inhibits activities of type 1 and type 2A phosphatases equally strongly facilitating protein phosphorylation, and also has various other effects. Source: *Discodermia calyx*.

Product Name	Wako Cat. No.	Pkg. Size
Cylindrospermopsin for Biochemistry	036-20341	250 µg



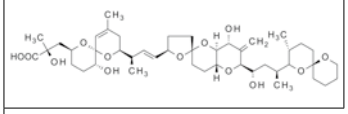
CAS No. 143545-90-8
$C_{15}H_{21}N_5O_7S$=415.42
[Assay] 97.0+% (HPLC)
[Solubility] Water
[Storage condition] Keep at -20°C.
[Summary] Cylindrospermopsin is a cyanotoxin. Freshwater toxins include hepatotoxins and neurotoxins. Cylindrospermopsin is a hepatotoxin, like microcystin.

Product Name	Wako Cat. No.	Pkg. Size
Maitotoxin for Biochemistry	134-17161	10 µg



CAS No. 59392-53-9
$C_{164}H_{256}Na_2O_{68}S_2$=3425.86
[Storage condition] Keep at -20°C.
[Summary] Maitotoxin is one of the causative substances of seafood poisoning (ciguatera) originating from dinoflagellates (Gambierdiscus toxicus), and named after the Tahitian name of striated surgeonfish, maito, a species of fish that can cause ciguatera poisoning. The effects of maitotoxin include smooth muscle contraction and release of a neurotransmitter, norepinephrine, both of which are considered to result from specific influx of extracellular Ca^{2+} into the cell. The influx of Ca^{2+} occurs even in the absence of voltage-dependant channels in the cell, making maitotoxin an ideal reagent to elucidate the mechanism of Ca^{2+}-mediated signal transduction. Source: *Gambierdiscus toxicus*.

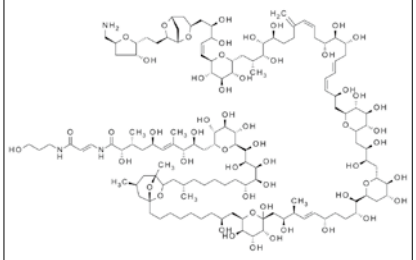
Product Name	Wako Cat. No.	Pkg. Size
Okadaic Acid for Biochemistry	152-03271	25 µg
	158-03273	100 µg



CAS No. 78111-17-8
$C_{44}H_{68}O_{13}$=805.00
[Assay] 80.0+% (HPLC)
[Solubility] Methanol
[Storage condition] Keep at -20°C.

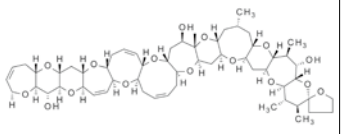
[Summary] Okadaic acid is a diarrhetic shellfish toxin isolated from Halichondria okadai. It has been reported to exert a wide range of physiological activities including non-TPA type promotor activity, smooth muscle contraction in calcium-free solution, and increased protein phosphorylation due to specific inhibition of protein phosphatases (inhibition potency: type 2A>type 1). Source: *Halichondria okadai*.

Product Name	Wako Cat. No.	Pkg. Size
Palytoxin for Biochemistry	165-26141	100 µg



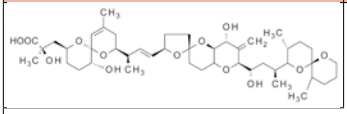
CAS No. 77734-91-9
$C_{129}H_{233}N_3O_{54}$=2680.14
[Solubility] Water
[Storage condition] Keep at -20°C.
[Summary] Okadaic acid is a diarrhetic shellfish toxin isolated from Halichondria okadai. It has been reported to exert a wide range of physiological activities including non-TPA type promotor activity, smooth muscle contraction in calcium-free solution, and increased protein phosphorylation due to specific inhibition of protein phosphatases (inhibition potency: type 2A>type 1). This product is a sodium salt of okadaic acid. Source: *Halichondria okadai*.

Product Name	Wako Cat. No.	Pkg. Size
CiguatoxinCTX 3C for Biochemistry	030-21581	100 ng



CAS No. 148471-85-6
$C_{57}H_{82}O_{16}$=1023.25
[Storage condition] Keep at -20°C.
[Summary] Ciguatoxins are produced by toxic dinoflagellates and the cause of ciguatera, the most common seafood poisoning in the world with more than 50,000 cases reported annually worldwide.

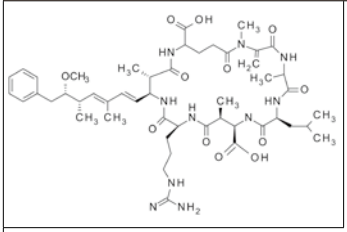
Product Name	Wako Cat. No.	Pkg. Size
Dinophysistoxin-1 for Biochemistry	042-33671	100 µg



CAS No. 81720-10-7
$C_{45}H_{70}O_{13}$=819.03
[Solubility] Methanol
[Storage condition] Keep at -20°C.

[Summary] Dinophysistoxin-1 is a diarrhetic shellfish toxin isolated from Halichondria okadai. It is a 35-methyl derivative of okadaic acid, which is also isolated from Halichondria okadai, and exerts similar effects to okadaic acid. Activities as a non-TPA type tumor promotor and a specific protein phosphatase inhibitor have been reported. Source: *Halichondria okadai*.

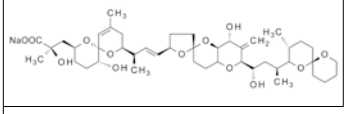
Product Name	Wako Cat. No.	Pkg. Size
Mycalolide B for Biochemistry	132-12081	100 µg



CAS No. 122752-21-0
$C_{52}H_{74}N_4O_{17}$=1027.16
[Assay]95.0+%(HPLC)
[Solubility] Methanol
[Reference] Saito, S. *et al*.: *J. Biol. Chem*., **269**, 29710 (1994).
Saito, S. & Karaki, H.: *Kagaku to Seibutsu*, **33**, 212 (1995)
Fusetani, N. : *New J. Chem*., **14**, 721 (1990).

[Summary] Mycalolide B suppresses smooth muscle contraction and actomyosin ATPase activity. Mycalolide B depolymerizes F-actin in a concentration-dependent manner and this effect is regarded to be stronger than cytochalasin D. The inhibition of actin polymerization leads to suppression of platelet activation. Treatment with a high concentration of mycalolide B results in complete dissociation of actin filaments to monomers, meaning that activation by actin filaments of Mg^{2+}-ATPase of actomyosin and acto-S1 is suppressed, while basal activity of myosin Mg^{2+}-ATPase is left intact. Mycalolide B forms a 1:1 complex with G-actin, preventing actin elongation.

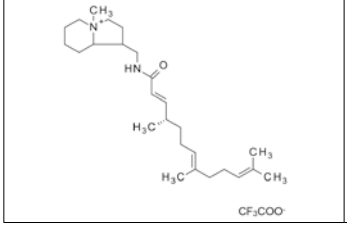
Product Name	Wako Cat. No.	Pkg. Size
Okadaic Acid Sodium Salt for Biochemistry	155-03381	100 µg



CAS No. 209266-80-8
$C_{44}H_{67}NaO_{13}$=826.98
[Assay] 80.0+% (HPLC)
[Solubility] Methanol
[Storage condition] Keep at -20°C.

[Summary] Okadaic acid is a diarrhetic shellfish toxin isolated from Halichondria okadai. It has been reported to exert a wide range of physiological activities including non-TPA type promotor activity, smooth muscle contraction in calcium-free solution, and increased protein phosphorylation due to specific inhibition of protein phosphatases (inhibition potency: type 2A>type 1).
This product is a sodium salt of okadaic acid. Source: *Halichondria okadai*.

Product Name	Wako Cat. No.	Pkg. Size
Stellettamide A Trifluoroacetate for Biochemistry	193-11831	100 µg



CAS No. 129744-24-7
$C_{26}H_{45}N_2O{\cdot}CF_3COO$=54.66
[Assay] 95.0+% (HPLC)
[Solubility] Methanol
[Storage condition] Keep at -20°C.
[Summary] Stellettamide A is isolated from a marine sponge (*Stelletta* sp.) and can inhibit calmodulin activity.
Source: *Stelletta* sponge.

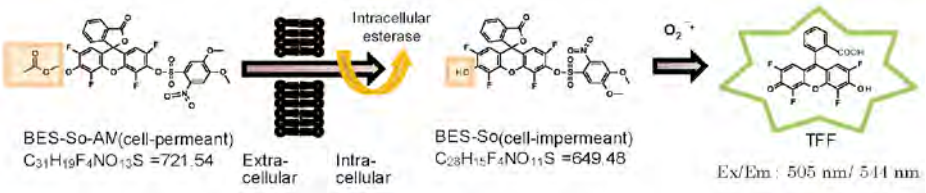
G. Fluorescent Probes

1. Superoxide-selective fluorescent probes

BES-So-AM / BES-So

Features

- Existing probes: Specificity much higher than hydroethidine
- Selectively reacts with superoxide / enables detection of superoxide production in live cells
- BES-So-AM is cell-permeant
- Highly water-soluble and can be prepared as an aqueous solution
- Applicable to flow cytometry



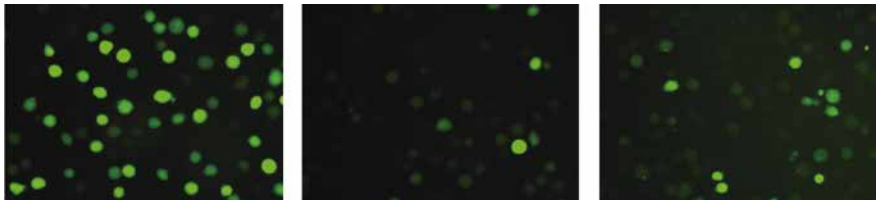
BES-So-AM: Application examples

Fluorescence imaging

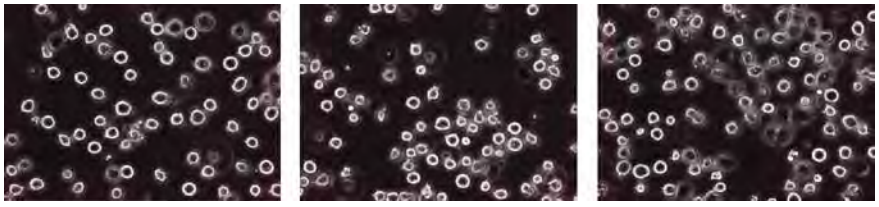
1) O_2^-• production stimulated

2) O_2^-• production unstimulated

3) O_2^-• production stimulated + O_2



Phase contrast imaging



Images 1) and 2) were obtained by culturing Jurkat T cells in a medium containing 33 mcM BES-So-AM at 37°C for 1 h to allow cellular uptake of the probe, followed by further culturing for 1 h after addition of 5 mM butyric acid [O_2^-• production stimulated] or without butyric acid addition [O_2^-• production unstimulated].
Image 3) was obtained by culturing Jurkat T cells in a medium containing 33 mM BES-So-AM and tiron (O_2^-• scavenger) at 37°C for 1 h followed by culturing for 1 h after addition of 5 mM butyric acid.
(Data provided by Prof. Hatsuo Maeda, School of Pharmacy, Hyogo University of Health Sciences)

References

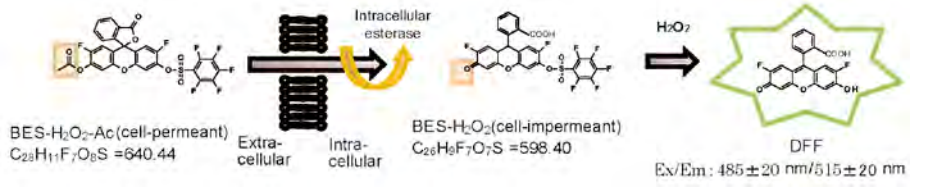
1) Maeda, H. *et al.: J. Am. Chem. Soc.*, **127**, 68 (2005).
2) Maeda, H. *et al.: Chem. Eur. J.*, **13**, 1946 (2007).

2. Hydrogen peroxide selective fluorescent probes

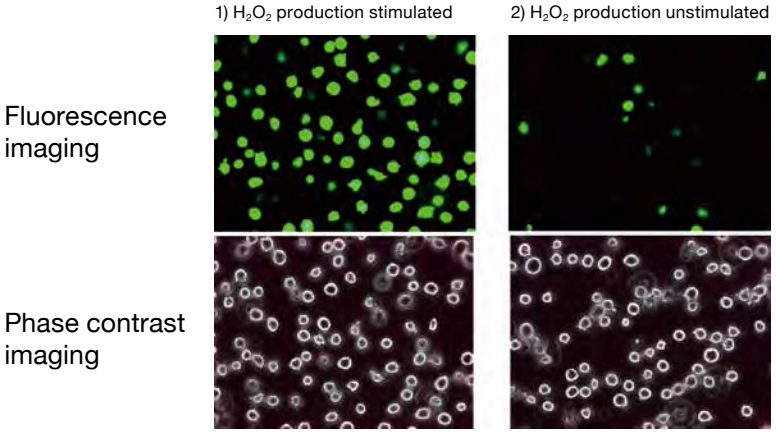
BES-H_2O_2-Ac / BES-H_2O_2

Features

- Existing probes: Specificity much higher than DCFH
- Enables detection of hydrogen peroxide production in live cells
- BES-H_2O_2-Ac is cell-permeant
- Highly water-soluble and can be prepared as an aqueous solution
- Applicable to flow cytometry



BES-H_2O_2-Ac: Application examples



Images 1) and 2) were obtained by culturing Jurkat T cells in a medium containing 50 mcM BES-H_2O_2-Ac at 37°C for 1 h to allow cellular uptake of the probe, followed by further culturing for 1 h after addition of 5 mM butyric acid [H_2O_2 production stimulated] or without butyric acid addition
[H_2O_2 production unstimulated].
(Data provided by Prof. Hatsuo Maeda, School of Pharmacy, Hyogo University of Health Sciences)

References

1) Maeda, H. *et al.*: *Angew. Chem. Int. Ed.*, **43**, 239 (2004).
2) Maeda, H. *et al.*: *Chem. Pharm. Bull.*, **49**, 294 (2001).

3. Thiol/selenol-selective fluorescent probe

BES-Thio

Features

- Selectively reacts with thiol groups (at pH 7.4)
- Selectively reacts with selenol groups (at pH 5.8)
- Highly water-soluble and can perform both of enzymatic and detection reactions simultaneously

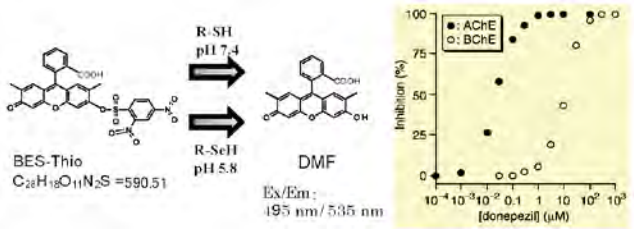


Figure. Inhibition curves of acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) by acetylcholinesterase inhibitor (donepezil).
Use of BES-Thio revealed that donepezil selectively inhibits AChE at lower concentrations than does BChE.
Detection principle: Acetylocholine and butyrylocholine were used as substrates for AChE and BChE, respectively, and thiocholine produced from the enzymatic reactions was detected.
(Data provided by Prof. Hatsuo Maeda, School of Pharmacy, Hyogo University of Health Sciences)

References

1) Maeda, H. *et al.*: *Angew. Chem. Int. Ed.*, **44**, 2922 (2005).
2) Maeda, H. *et al* .: *Angew . Chem. Int. Ed.*, **45**, 1810 (2006).

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
BES-So-AM (Cell-permeant)	021-17801	1 mg	for Cellbiology	Keep at RT.
BES-So (Cell-impermeant)	025-18921	1 mg		
BES-H_2O_2-Ac	028-17811	1 mg		
BES-H_2O_2 (Cell-impermeant)	024-18751	1 mg		
BES-Thio	025-15481	1 mg		

4. Fluorescent probes for Alzheimer's Disease

Product Name	Wako Cat. No.	Package Size*	Grade	Storage Condition
BF-168	029-16361	1 mg	for Cellbiology	Keep at -20°C.
BF-170	026-16371	1 mg		
BF-187	022-18811	1 mg		
BF-188	025-18801	1 mg		

*: 1mg corresponds to abt. 100 slides
Please see the page No.11 for the detailed information.

H. Neural Cell Culture

1. Serum-free Culture Medium for Neural Cells

for cultivation of nerve cells/nerve stem cells

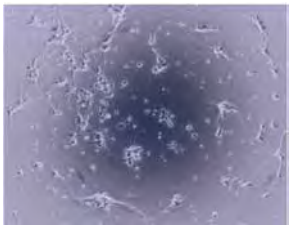
NS Basal Medium / NS Supplement

NS basal medium is optimized for cultivation of nerve cells, and NS supplement is serum-free supplement for this cultivation. The medium and supplement can be used for cultivation of nerve cells and neural stem cells isolated from rat hippocampus. Mix NS basal medium and NS supplement before cultivation. Please note that NS basal medium is free from L-glutamine.

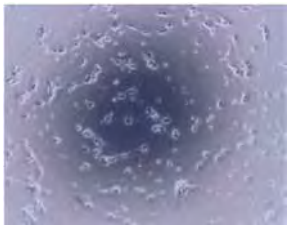
Cultivation of primary nerve cells derived from rat hippocampus

Nerve cells isolated from hippocampus of rat fetus (E19) were cultivated on poly-L-lysine coated plate. Panels below show morphology of cells on Day 6 and expression of neuron marker (Map2 (a+b)) and glial cell marker (GFAP) on Day 21.

Day 6 of cultivation



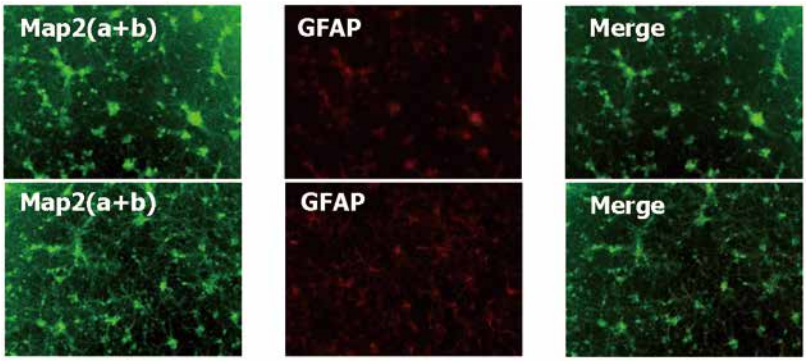
NS basal medium/NS supplement



Competitor's basal medium/supplement

< Composition of medium >
NS Basal Medium + 2% NS Supplement
+ 0.5 mmol/L L-glutamine
< Number of cells inoculated>
13,000cells/well (96 well plate)

Day 21 of cultivation



NS basal medium/ NS supplement

Competitor's basal medium/supplement

Comparison of cell count derived from Rrat hippocampusal neural cell number and neuron marker expressio

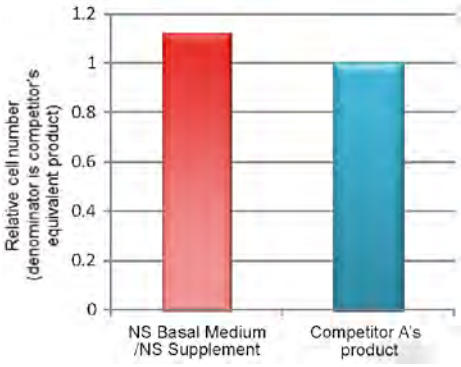
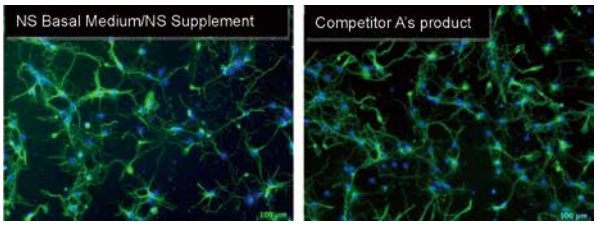


Fig.1.
Comparison of cell count

Nerve cells derived from hippocampus of rat fetus (E19) were cultivated for 5 days on a poly-L-lysine coated plate containing NS basal medium mixed with NS supplement at final concentration of 2%, and the cell count was compared with the result obtained from cultivation using competitor's products.



Green: Neuron marker (TuJ1)
Blue: Nucleus (DAPI)

Figure 2. Detection of neuron marker
Neuron marker, βIII-Tubulin (TuJ1) and nucleus (DAPI) were stained.

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
NS Basal Medium	148-09615	500 mL	for Cell Culture	Keep at 2-10°C.
NS Supplement (×50)	146-09351	10 mL		Keep at -20°C.
NS Supplement (×50) without Vitamin A	142-09691	10 mL		

Do you have any problem in cultivation of primary nerve cell?

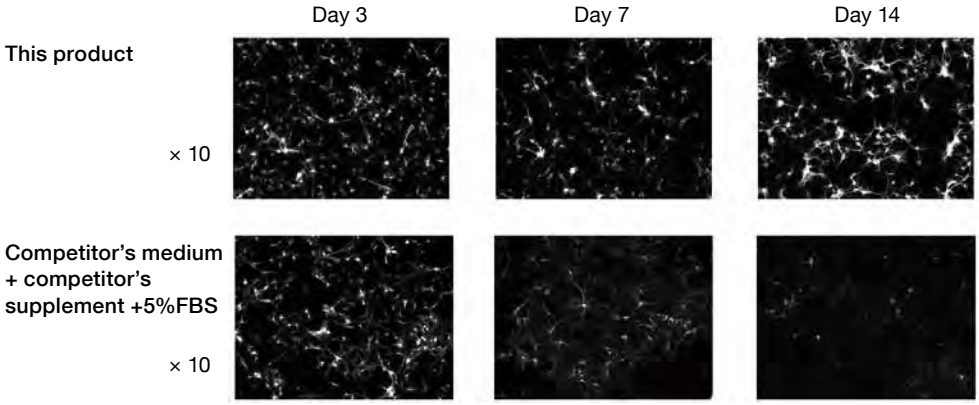
Neuron Culture Medium

This medium is for nerve cells and enables stable cultivation of primary nerve cell. It is optimized for central nervous system cell culture.
This product contains a culture supernatant of rat glial cell.
The product is manufactured as a succession of Sumitomo Bakelite Co., Ltd.'s neuron culture medium (cat. no. MB-X9501), based on the technology transferred from Sumitomo Bakelite.

Features

- Rapid neurite elongation
- Low density culture

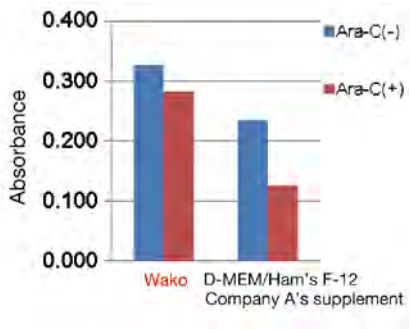
Activity to maintain survival: Neurite elongation (MAP2 immunostaining)



Operating condition
Cell count: 6.6 × 10^5 cell/mL (dispersed from cerebelllum of embryonic day 18 mouse)
Cultivation scale: 500 µL/well (glass bottom dish)
Procedure: Half of medium was replaced on Day 3 and 7. 2 µM of Ara-C was added from Day 3

Data provided
Courtesy of H. J. Okano and Y. Ogawa at Regenerative Medicine Research Laboratory, Jikei University School of Medicine

Activity to maintain survival (MTT assay)



Operating condition:
Cell count: 2.5 × 10^5 cells/mL
(dispersed from cerebral hemisphere of embryonic day 17 mouse)
Cultivation scale:
200 µL/well (48 well plate)
Procedure:
Ara-C(-): Cultivated at 37°C under presence of CO_2 5% for 5 days
Ara-C(+): Cultivated at 37°C under presence of CO_2 5% for 3 days. Subsequently, 200 mcM Ara-C was added at amount of 10 µL/well, and cultivated for additional 2 days (cultivated for 5 days in total)

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
Neuron Culture Medium	148-09671	100 mL	for Cell Culture	Keep at -80°C.

Serum replacement for neural stem cell culturing

N2 Supplement

N2 Supplement is used as replacement of general serum of neural cell culturing. Product is suitable for culturing of primary nerve cell and neural stem cell.
Differentiation induction of neural stem cell is triggered by elements contained in FBS. Serum substitutes like N2 Supplement are used for maintaining undifferentiated stage of stem cells during culturing.
We supply N2 Supplements with transferrin (Apo) and with transferrin (Holo). N2 Supplement with transferrin (Apo) can reduce the amount of or ferric ions added to the medium, which may be suitable for culturing of certain cells such as those prone to oxidative stress.

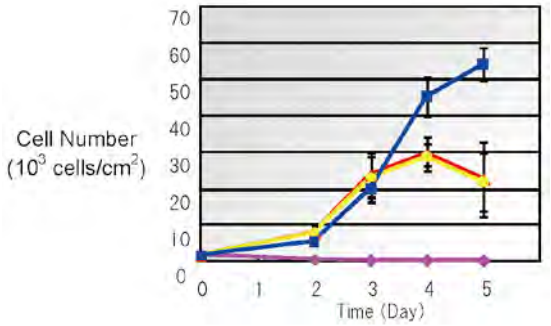
QC tests

- Sterilization test
- Endotoxin test
- Mycoplasma test
- pH
- Osmotic
- Cell culture test

Components

Component	Conc. (μg/mL)
Insulin, human, recombinant	500.00
Transferrin, human	10,000.00
Progesterone	0.63
Putrescine · 2HCl	1,611.00
Sodium Selenite	0.52

Rat Hippocampus Neural Stem Cell Culture

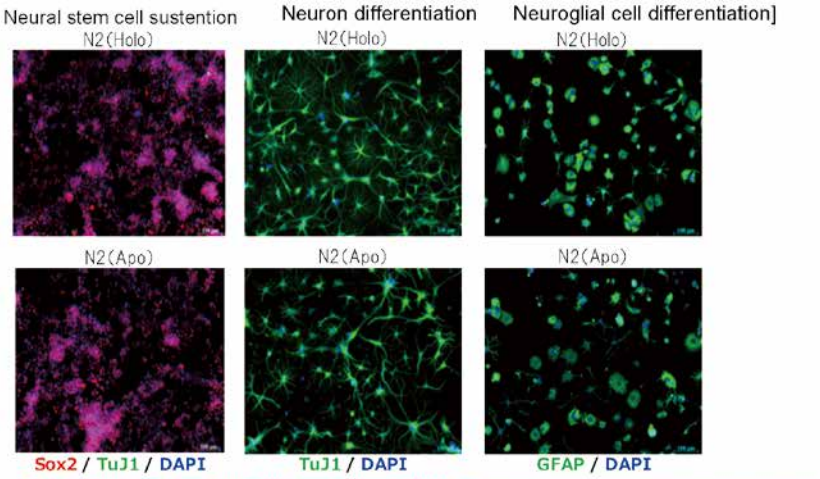


without N2
with N2 (Holo) [Wako Cat. No. 141-08941]
with N2 (Apo) [Wako Cat. No. 141-09041]
Competitor A

[Culture media component]
D-MEM/Ham's F-12 + 2 mmol/L L-Glutamine
+ 1 × N2 Supplement + 1 × Penicillin-Streptomycin
+ 25 ng/mL bFGF
[Seeding cell number] 16,000 cells/cm² (12 well plate)
[Culture condition] 37°C, 5% CO_2

Rat hippocampus neural stem cell sustention - Neural differentiation - Neuroglial cell

Rat hippocampal neural stem cells were cultured in a medium containing either type of N2 Supplement and maintained in the undifferentiated state or allowed to differentiate into neurons and glial cells. Expression of specific markers was confirmed in each cell type.



Sox2: a marker of undifferentiated embryonic stem cells; TuJ1: a neuronal differentiation marker
GFAP: Astrocyte marker; DAPI: a DNA marker

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
N2 Supplement with Transferrin (Holo)(×100)	141-08941	5 mL	for Cell Culture	Keep at -20°C.
N2 Supplement with Transferrin (Apo)(×100)	141-09041	5 mL		

4. Neuron Dissociation Solutions

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
Neuron Dissociation Solutions <Kit Contents> • Enzyme Solution 5 mL × 4 • Dispersion Solution 5 mL × 4 • Isolation Solution 5 mL × 4	291-78001	4 set	for Cell Culture	Keep at -80°C.
Neuron Dissociation Solutions S <Kit Contents> • Enzyme Solution 2.5 mL × 10 • Dispersion Solution 2.5 mL × 10 • Isolation Solution 2.5 mL × 10	297-78101	10 set	for Cell Culture	Keep at -80°C.

5. Related Products

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
200 mmol/L L-Glutamine Solution (× 100)	073-05391	100 mL	for Cell Culture	Keep at -20°C.
Cytosine-1-β-D(+)-arabinofuranoside [Ara-C, Cytarabine]	030-11951	100 mg	for Biochemistry	Keep at 2-10°C.
	034-11954	500 mg		
	036-11953	1 g		

I. Low-Molecule Compounds

1. ALS

Wako Cat. No.	Product Name	Pkg. Size
097-06511	**INI-0602**	1 mg
093-06513		5 mg

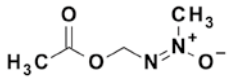
Please see the page No.14 for the detailed information.

2. Alzheimer's Disease

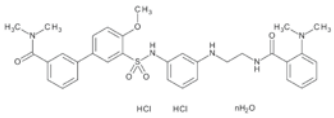
Wako Cat. No.	Product Name	Pkg. Size
104-00051	**Joro Spider Toxin JSTX-3**	0.1 mg
115-00901	**KMI-429**	1 mg
112-00911	**KMI-574**	1 mg
119-00921	**KMI-1027**	1 mg
116-00931	**KMI-1303**	1 mg
205-17381	**TFAP**	10 mg
097-06511	**INI-0602**	1 mg
093-06513		5 mg

Please see the page No.14 for the detailed information.

3. Schizophrenia Research

Wako Cat. No.	Product Name	Grade	Pkg. Size		
136-16303	**Methylazoxymethanol Acetate [MAM]**	for Cellbiology	20 mg		CAS No. 592-62-1 $C_4H_8N_2O_3$ = 132.12 [Assay] 90.0+ % (HPLC) [Storage condition] Keep at -20°C. [Summary] This product is used for preparation of schizophrenia animal model. Neurogenesis is decreased in rats administered this product. It is reported that deteriorated neurogenesis correlates to lowered PPI (lead stimulus inhibition, prepulse inhibition) observed in schizophrenia patients.

4. Wakefulness Regulation

Wako Cat. No.	Product Name	Grade	Pkg. Size		
254-00641	**YNT-185 Dihydrochloride Hydrate**	for Cellbiology	5 mg		CAS No. 1804978-82-2 $C_{33}H_{37}N_5O_5S \cdot 2HCl \cdot nH_2O$ ($C_{33}H_{37}N_5O_5S \cdot 2HCl$=688.66) [Solubility] Water [Storage condition] Keep at -20°C. [Reference] Nagahara, T., *et al.*: *J. Med. Chem.*, **58**, 7931 (2015). [Summary] This product is a non-peptide, selective orexin 2 receptor agonist. Orexin 2 receptor is involved in sleep/wakefulness and its agonist facilitates wakefulness. Evidence suggests that the agonist is effective for treatment of narcolepsy. It is reported that YNT-185 dihydrochloride administered to a mouse brain ventricle increases wakefulness of the mouse in a dose-dependent manner.
250-00643			100 mg		

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