

Neuroscience Research

- A. Tissue Optical Clearing Reagents
- B. Alzheimer's Disease Research
- C. Parkinson's Disease Research
- D. Sleep Disorder Research
- E. Antibodies
- F. Fluorescent Probes
- G. Neural Cell Culture
- H. Low-Molecule Compounds
- I. Near-Infrared Emission-Luciferin Analogue

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A. Tissue Optical Clearing Reagents

Take a Revolutionary Approach to Deep Image SCALEVIEW-S

Dr. Atsushi Miyawaki et al. developed a sorbitol-based optical clearing method, *Scale S*. SCALEVIEW-S is a high-performance clearing method combined effective clearing with tissue/signal preservation. It is also noteworthy that many of proteins are highly preserved at the light microscopy level and brain histology at the electron microscopy level for multi-scale, serial visualization in SCALEVIEW-S. SCALEVIEW-S is a simple and reproducible method of accurate visualization of biological tissue.

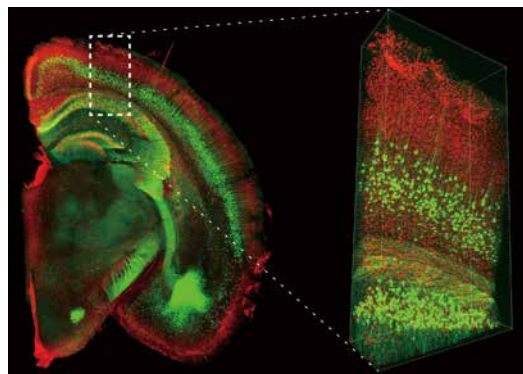
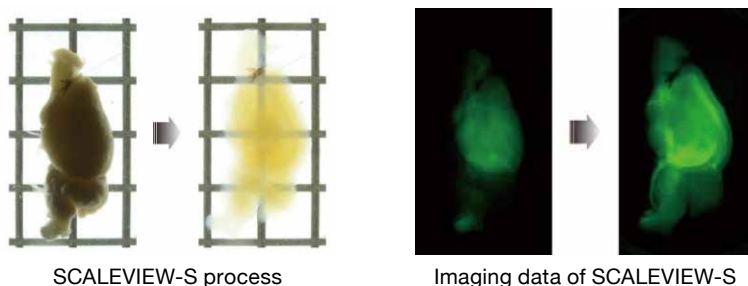
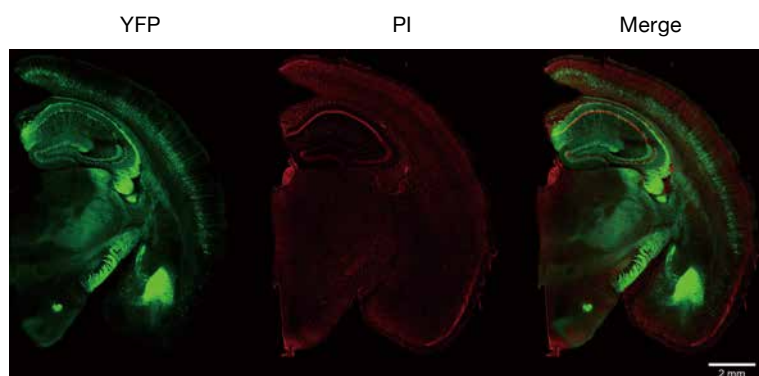


Image data courtesy of: Hiroshi Hama, Atsushi Miyawaki
Laboratory for Cell Function Dynamics RIKEN Brain Science Institute, Tetsushi Hoshida Biotechnological Optics Research Team RIKEN Center for Advanced Photonics and cooperate with Olympus Corporation

Imaging data using SCALEVIEW-S



Left: a mouse brain before SCALEVIEW-S process
Right: a mouse brain after SCALEVIEW-S process



Mouse: *Thy1-YFP-H* line, 42W, ♂
Brain Size: Coronal Slice (t: 2mm)
Microscope (CLSM): Olympus FV3000 (inverted)
Objective Lens: 10×/N10.40 (UPLSAPO10×)
Laser: 488nm (for YFP), 561nm (for PI)
Imaging Depth: 0-450μm from surface

Procedure

(Fixation)

A case for making mouse brain transparent according to reference (1).

- 1) Transcardially perfuse an anesthetised mouse with 4% paraformaldehyde (PFA) /PBS (pH 7.6~7.8).
- 2) Remove the whole brain and subject it to post-fixation in 4% PFA/PBS at 4°C for 8-72 hrs.
- 3) Wash the samples in PBS.
- 4) Prepare vibratome sections (optional, 0.2-3 mm thick)

(Clearing) (1-2mm samples)

- 5) Transfer the sample into 5ml of SCALEVIEW-S0 solution and incubate it with gentle shaking (70-90rpm) at 35-40°C for 12-24 hours.
- 6) Transfer the sample into 5ml of SCALEVIEW-S1 solution and incubate it with gentle shaking (70-90rpm) at 35-40°C for 12-24 hours.
- 7) Transfer the sample into 5ml of SCALEVIEW-S2 solution and incubate it with gentle shaking (70-90rpm) at 35-40°C for 12-24 hours.
- 8) Transfer the sample into 5ml of SCALEVIEW-S3 solution and incubate it with gentle shaking (70-90rpm) at 35-40°C for 12-24 hours.
- 9) Transfer the sample into 5ml of deScale Solution and incubate it with gentle shaking (40-50rpm) at 4°C for 3 hours ×3times.
- 10) Transfer the sample into 5ml of SCALEVIEW-S4 solution and incubate it with gentle shaking (40-50rpm) at 35-40°C for 24-72 hours.
- 11) The transparency can be evaluated by eye at this stage. If the sample is successfully cleared, the adult brain sample should look amber under a light source.
- 12) Transfer the sample into 5ml of SCALEVIEW-SMtsolution and incubate it with gentle shaking (40-50rpm) at 35-40°C for 24-72 hours.

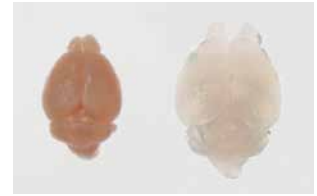
SCALEVIEW-A2

A

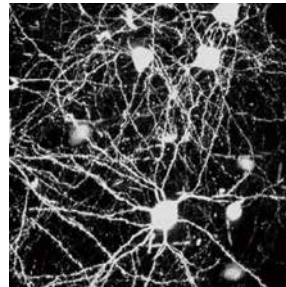
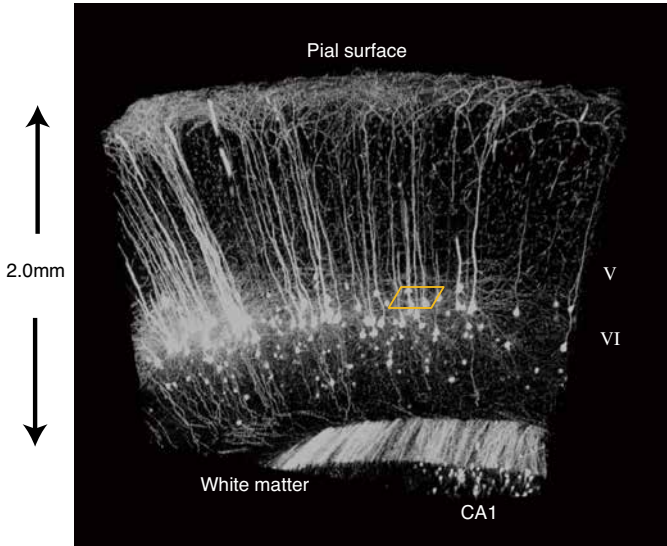
Tissue Optical Clearing Reagents

Dr. Atsushi Miyawaki et al. developed a water-based optical clearing reagent, Scale, which clears fixed biological samples without quenching fluorescent protein. Using SCALEVIEW-A2, bodily tissues can be cleared of their opacity to provide a clearly defined image.

The SCALEVIEW approach integrates seamlessly with multiphoton microscopes, providing the power to visualise 3-dimensional structures at unprecedented depths in morphologically intact tissue.



A mouse brain after SCALEVIEW-A2 process
 Left: a mouse brain before SCALEVIEW-A2 process
 Right: a mouse brain after SCALEVIEW-A2 process

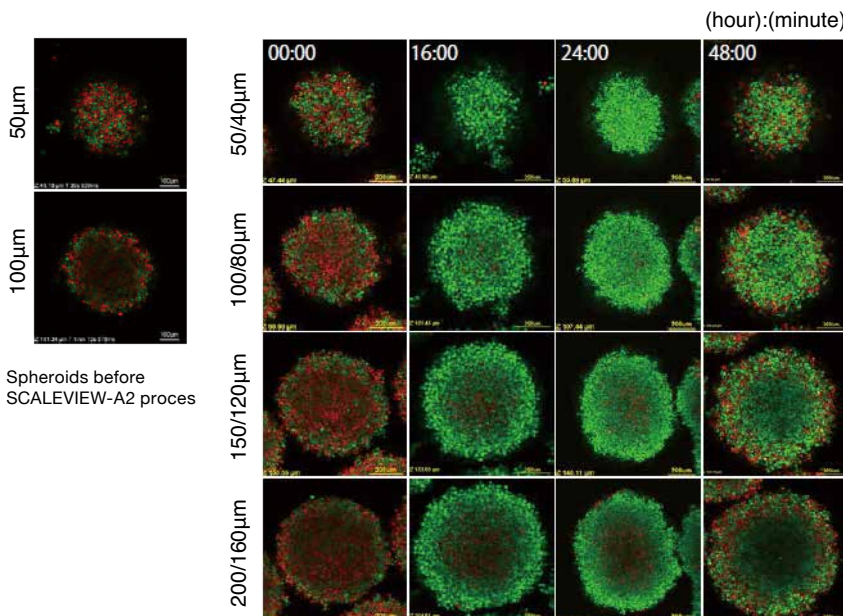


Imaging of Thy1-YFP (H Line) mouse brain after SCALEVIEW-A2 process using Multiphoton microscope and Multiphoton dedicated objective: OLYMPUS, model: XLPLN10XSVM.P. Bars, 50µm.

Procedure

Example: Rendering mouse brain tissue transparent for deep imaging according to reference¹⁾.

- 1) Transcardially perfuse an anesthetised mouse with 4% paraformaldehyde (PFA) /PBS (pH 7.5–8.0).
- 2) Remove the whole brain and subject it to post-fixation in 4% PFA/PBS at 4°C for 10 hrs and cryo-protection in 20% sucrose/PBS at 4°C for 24
- 3) Embed the sample in OCT compound and freeze it with liquid nitrogen.
- 4) Thaw and rinse the sample in PBS, and fix it again with 4% PFA/PBS for 20 min at room temperature.
- 5) Clear the sample by incubation in SCALEVIEW-A2 at room temperature.
 More than 30 ml of SCALEVIEW-A2 is required for an adult mouse brain.
 A full week of incubation may be necessary for transparency.
 During incubation, stir slowly using an orbital shaker.
 Exchanging SCALEVIEW-A2 each day accelerates the transparency process.
 The sample might be expanded 10-30% in one direction after incubation.
- 6) Perform deep imaging of the transparent brain using an appropriate dipping objective lens. Use SCALEVIEW-A2 as the immersion medium.
 If necessary, immobilize the sample to the bottom of the imaging vessel with agarose.
- 7) The transparent brain can be stored for a long time in SCALEVIEW-A2 at 4°C.



Fluorescence distribution in SCALEVIEW-A2 treated spheroids after irradiation. Fluorescence imaging at depths of 50, 100, 150, and 200µm in a Scale-treated spheroid at the indicated times after 10-Gy irradiation. Each spheroid was fixed and treated at the indicated times with SCALEVIEW-A2. Scale bar, 100µm.

References

- 1) Hama, H. *et al.* : *Nature Neuroscience.*, **14**, 1481 (2011).
- 2) Hama, H. *et al.* : *Nature Neuroscience.*, **18**, 1518 (2015).
- 3) Kaida A, Miura M. : *Biochem Biophys Res Commun.*, **439**, 453 (2013).

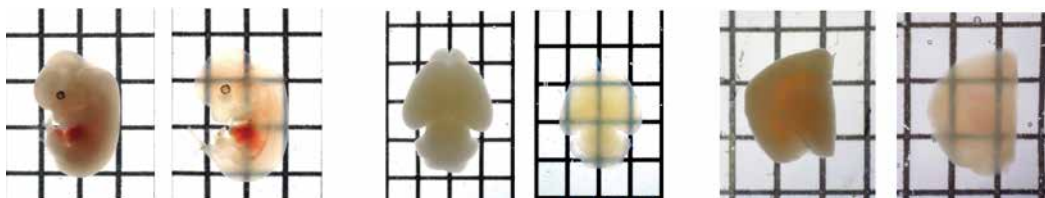
Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
SCALEVIEW-S0	196-18521	250ml	Tissue Optical Clearing Reagent	Keep at 2 -10°C
SCALEVIEW-S1	193-18531	250ml	Tissue Optical Clearing Reagent	Keep at 2 -10°C
SCALEVIEW-S2	190-18541	250ml	Tissue Optical Clearing Reagent	Keep at 2 -10°C
SCALEVIEW-S3	197-18551	250ml	Tissue Optical Clearing Reagent	Keep at 2 -10°C
SCALEVIEW-S4	194-18561	250ml	Tissue Optical Clearing Reagent	Keep at 2 -10°C
SCALEVIEW-SMt	191-18571	250ml	Tissue Optical Clearing Reagent	Keep at 2 -10°C
deScaleSolution	041-34425	500ml	Tissue Optical Clearing Reagent	Keep at 2 -10°C
SCALEVIEW-S Trial Kit	299-79901	1kit	Tissue Optical Clearing Reagent	Keep at 2 -10°C
SCALEVIEW-A2	193-18455	500ml	Tissue Optical Clearing Reagent	Keep at RT

SeeDB

Dr. Takeshi Imai. *et al.* developed a water-based optical clearing reagent, SeeDB (See Deep Brain), which clears fixed brain samples in a few days without quenching many types of fluorescent dyes, including fluorescent proteins and lipophilic neuronal tracers. SeeDB is a saturated solution of fructose in water with thioglycerol.

This method facilitates comprehensive and quantitative analyses for understanding neuronal circuitry, both in the adult and developing mouse brain.

Image of a mouse brain after SeeDB process



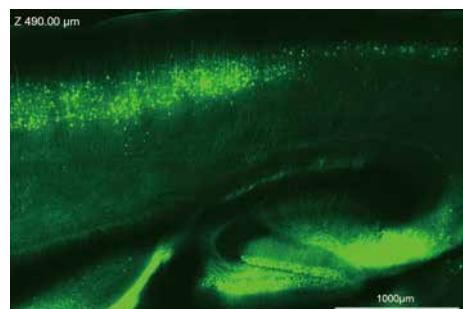
Mouse embryo and mouse brain before and after treatment with SeeDB

Imaging data using SeeDB

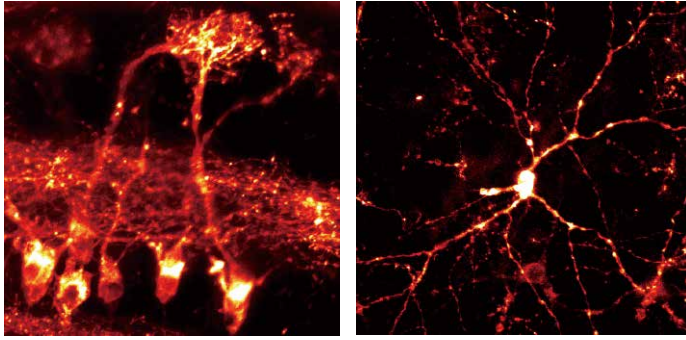


3,000 μm

Imaging of Thy1-YFP (H Line) mouse brain after SeeDB process using Multiphoton microscope and Multiphoton dedicated objective : OLYMPUS, model: XLPLN10XSVMP.



Imaging of Thy1-YFP (H Line) mouse brain after SeeDB process using Confocal microscope and objective : OLYMPUS, UPLSAPO 10X2.



Imaging of Dil-labeled mitral cells in the olfactory bulb after SeeDB processing using Confocal microscope and objective : OLYMPUS, UPLSAPO 20X. Bars, 100 μ m.

Procedure

(Fixation)

- 1) Fix the sample in 4% PFA at 4°C with gentle shaking overnight.
- 2) Wash the sample in PBS three times (10 min each)

(Clearing)

- 3) Incubate the sample in ~20 ml of SeeDB: 20w/v% Fructose Solution in 50 ml conical tube, and then place the conical tube on a tube rotator (~4 rpm) or a seesaw shaker (~17 rpm) for 4-8 h, respectively. A small piece of sample (e.g., slices) requires less time for optical clearing. Incubation should be performed at 25-37°C.
- 4) Incubate the sample in ~20 ml SeeDB: 40w/v% Fructose Solution for 4-8 h as above.
- 5) Incubate the sample in ~20 ml SeeDB: 60w/v% Fructose Solution for 4-8 h. (Samples may no longer sink in 60% or higher concentrations of fructose.)
- 6) Incubate the sample in ~20 ml SeeDB: 80w/v% Fructose Solution for 12 h.
- 7) Incubate the sample in ~20 ml SeeDB: 100w/v% Fructose Solution for 12 h.
- 8) Incubate the sample in ~20 ml SeeDB for 24 h. The incubation time can be extended up to 48 h.
- 9) The transparency can be evaluated by eye at this stage. If the sample is successfully cleared, the adult brain sample should look amber under a light source.

(Observation)

- 10) Observe the SeeDB-treated samples under a fluorescence microscope. Samples should be mounted in SeeDB solution.

References

- 1) Ke, M. T., Fujimoto, S. and Imai, T. : *Nat Neurosci.*, **16** (8), 1154 (2013).
- 2) Ke, M. T., Fujimoto, S. and Imai, T.: *Bio-protocol.*, **4** (3), e1042 (2014).
- 3) Ke, M. T., and Imai, T. : *Curr Protoc Neurosci.*, **66**, 2.22.1-2.22.19 (2014).

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
SeeDB Trial Kit	291-79601	1 kit	Tissue Optical Clearing Reagent	Keep at RT
SeeDB: 20w/v% Fructose Solution	193-18391	250 mL	Tissue Optical Clearing Reagent	Keep at RT
SeeDB: 40w/v% Fructose Solution	196-18401	250 mL	Tissue Optical Clearing Reagent	Keep at RT
SeeDB: 60w/v% Fructose Solution	193-18411	250 mL	Tissue Optical Clearing Reagent	Keep at RT
SeeDB: 80w/v% Fructose Solution	190-18421	250 mL	Tissue Optical Clearing Reagent	Keep at RT
SeeDB: 100w/v% Fructose Solution	197-18431	250 mL	Tissue Optical Clearing Reagent	Keep at RT
SeeDB	194-18441	250 mL	Tissue Optical Clearing Reagent	Keep at RT

Chamber for cleared tissue sample -Related Products-

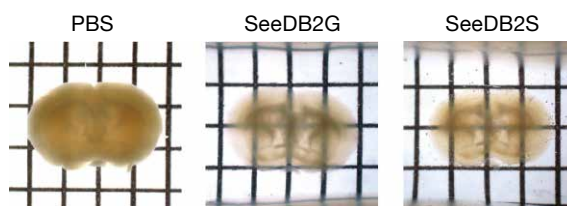
Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
See Through Chamber, 0.3mm thick	294-35631	10set	Tissue Optical Clearing Reagent	Keep at RT
See Through Chamber, 0.5mm thick	291-35641	10set	Tissue Optical Clearing Reagent	Keep at RT
See Through Chamber, 1.0mm thick	295-35661	10set	Tissue Optical Clearing Reagent	Keep at RT
See Through Chamber, 2.0mm thick	292-35671	10set	Tissue Optical Clearing Reagent	Keep at RT
See Through Chamber, 3.0mm thick	299-35681	10set	Tissue Optical Clearing Reagent	Keep at RT



SeeDB2

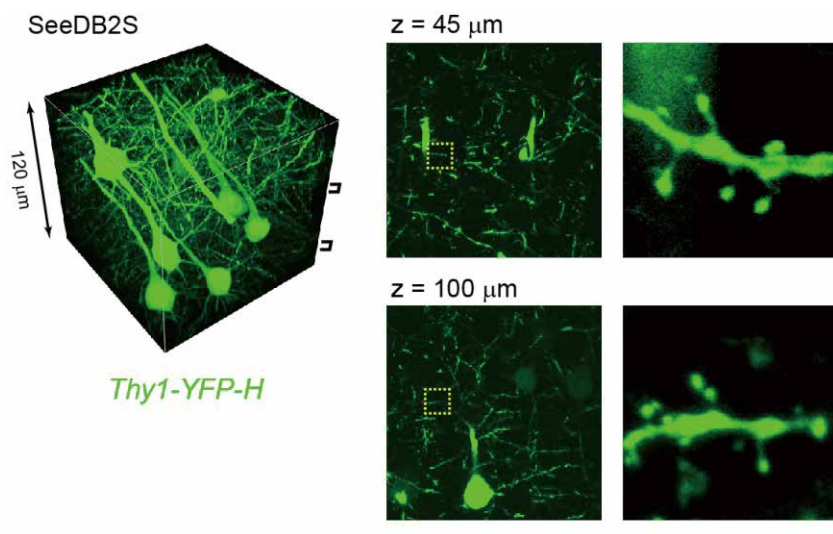
Drs. Ke and Imai developed a new type of tissue clearing agent, SeeDB2. SeeDB2 is ideal for high-resolution three-dimensional imaging of fluorescent proteins. SeeDB2G and S are designed match the refractive indices of glycerol (1.46) and oil (1.518), minimizing spherical aberrations for high-NA glycerol- and oil-immersion objective lenses, respectively. SeeDB2 is particularly powerful in confocal and super-resolution microscopy using high-NA objective lenses. It is noteworthy that many of fluorescent proteins are highly preserved in SeeDB2, much better than in PBS or other commercialized mounting media optimized for fluorescent dyes. Thus, SeeDB2 is also an ideal mounting medium for samples labeled with fluorescent proteins. SeeDB2 is useful not only for thick brain tissues, but also for thin samples for cell biology or tissue sections.

Image of a mouse brain after SeeDB2 process



Mouse brain slice (adult, 1.5mm-thick) before and after clearing with SeeDB2.

Imaging data using SeeDB2



Confocal images of brain slices from a Thy1-YFP-H (line H) mouse. An oil-immersion objective lens (NA 1.4) was used. Note that fluorescence level did not decrease even though laser power was constant throughout depth. Scale bars are 2 μ m.

Reference

1) Ke, M. T., and Imai, T. : *Cell Reports.*, **14** (11), 2718 (2016).

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
SeeDB2 Trial Kit	Coming soon	1 kit	Tissue Optical Clearing Reagent	Keep at RT

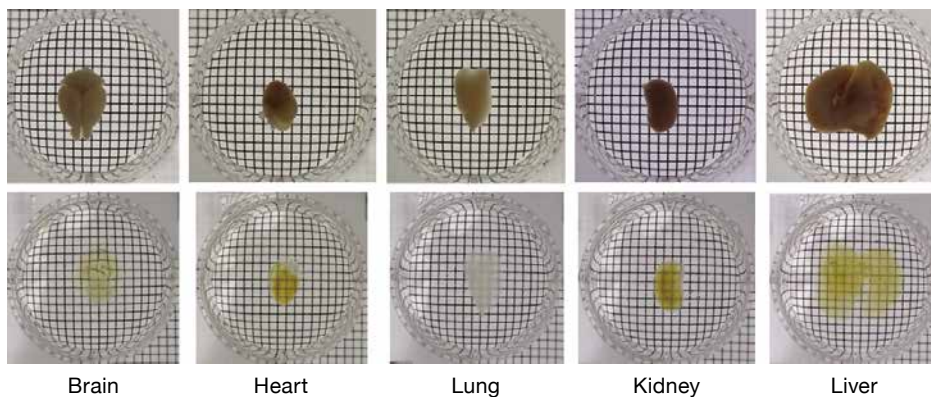
CUBIC

A

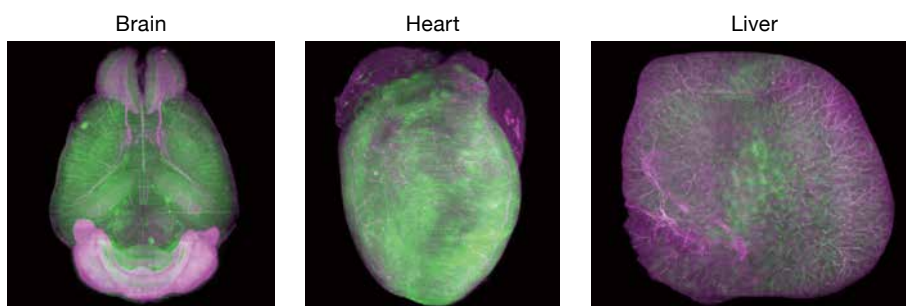
Tissue Optical Clearing Reagents

Dr. Susaki and Ueda developed a new clearing method, CUBIC (Clear, Unobstructed Brain/Body Imaging Cocktails and Computational analysis). CUBIC is a simple method that enables efficient whole-organ clearing, rapid imaging by light sheet fluorescence microscopy (LSFM). It can also be observed a slice organs and a whole organs with confocal microscopy or two-photon microscopy. CUBIC is also applicable to multicolor imaging of fluorescent proteins or immunostained samples. CUBIC is useful not only for brain tissues, but also for whole organs for 3D imaging in cell biology.

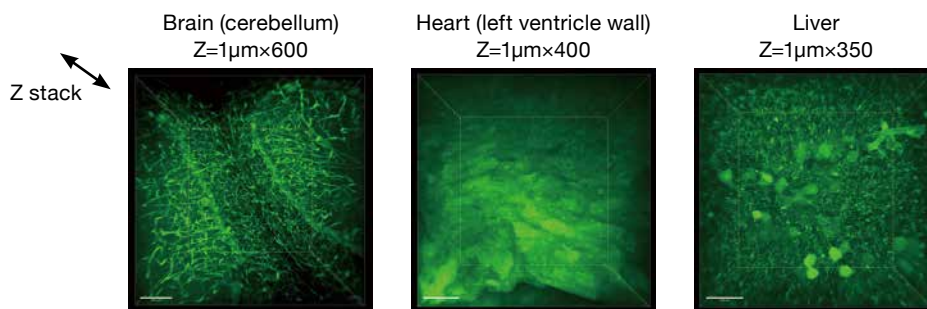
Images of mouse whole organs (brain, heart, lung, kidney and liver) after CUBIC process



Imaging data using CUBIC



LSFM images of whole organs from a CAG-EGFP Tg mouse (8w male).
Red: PI



Confocal images of 2mm slices from a CAG-EGFP Tg mouse (8w male).

Microscope (CLSM): Olympus FV1000
Objective Lens: XLPLN25XGMP
Laser: 473nm
Adjust RI to 1.485
Scale bars are 100µm.

References

- 1) E. A. Susaki. *et al.* : *Cell*, **157** (3), 726 (2014).
- 2) E. A. Susaki. *et al.* : *Cell*, **159** (4), 911 (2014).
- 3) E. A. Susaki. *et al.* : *Nature protocols*, **10**, 1709 (2015).
- 4) S. Nojima. *et al.* : *Scientific Reports*, **7**, 9269 (2017).

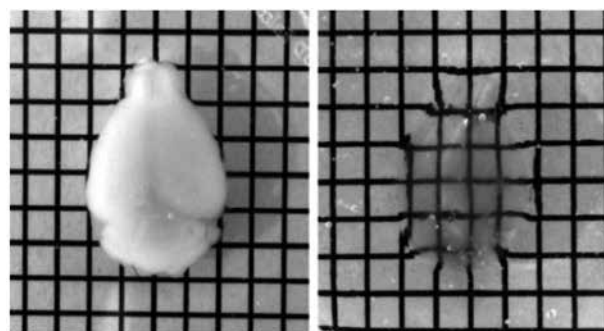
Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
CUBIC Trial Kit	Coming soon	1 kit	Tissue Optical Clearing Reagent	Keep at RT

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

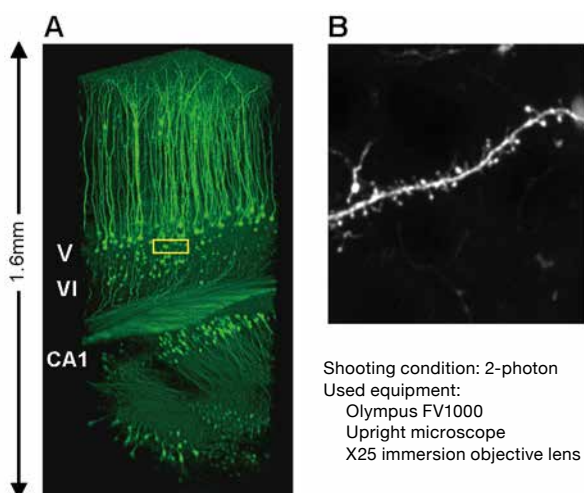


Fig. 1. Fluorescence imaging of Thy1-YFP (H Line) mouse cerebrum after CLARITY treatment
 (A) A 3D image from the brain mantle to hippocampus
 (B) An image of dendrites of pyramidal cells in the cerebral cortex layer V

Imaging of mouse brain with CLARITY + antibody treated

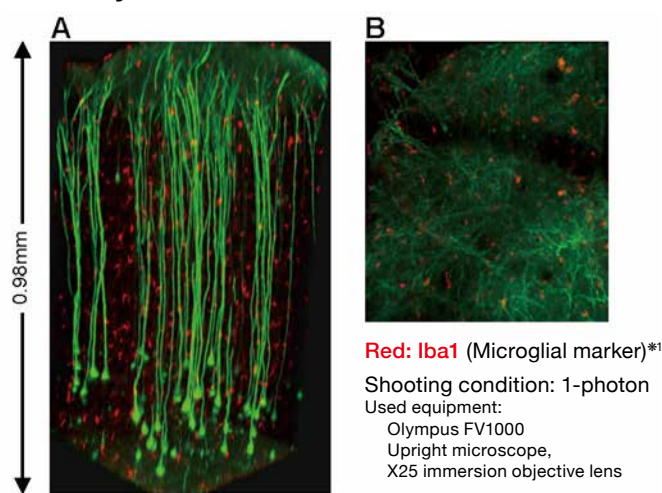


Fig. 2. Fluorescence imaging of Thy1-YFP (H Line) mouse cerebrum immunostained with Iba1 antibodies after CLARITY treatment
 (A) A 3D image of microglia in the brain mantle
 (B) An image of the cortex layer I from the surface layer

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

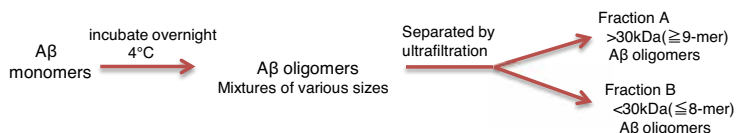
*2: Available for sale in the US only

*1: Related Products

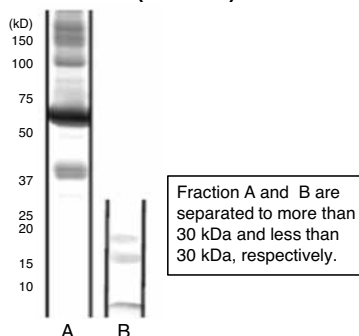
Product Name	Wako Cat. No.	Package Size	Grade
Anti Iba1, Rabbit (for Immunocytochemistry) Please see the page No.16	019-19741	50 µg	for Immunocytochemistry

Specificity of A β oligomers in the ELISA

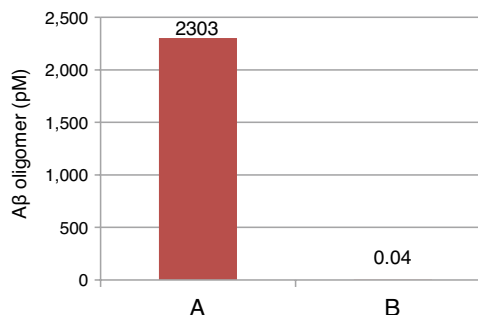
A β monomers were incubated the solution at 4°C overnight in order to synthesize various size of A β oligomers. They were separated Fraction A and Fraction B by ultrafiltration. The fractions were analyzed by western blotting and the A β oligomer ELISA.



Western blotting using A β antibody (BAN50)



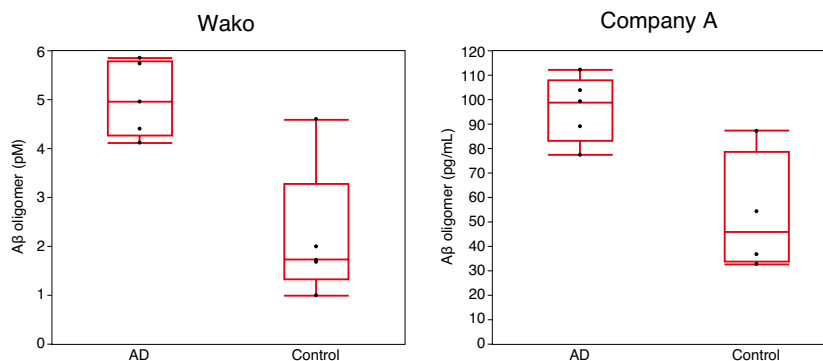
A β oligomer ELISA



A strong signal was exhibited in the fraction A containing 9-mer and more (>30 kDa), whereas few signal was detected in fraction B containing 8-mer and smaller (<30 kDa).

Example of measurement -human cerebrospinal fluid-

Cerebrospinal fluids of patients with Alzheimer disease (AD) and non-dementia patients (control), were measured with our ELISA kit and competitor's kit.



	MMSE score****	Wako A β oligomer kit (pM)	Company A A β oligomer kit (pg/mL)
Control1	-	0.98	ND
Control 2	-	1.99	33
Control 3	-	1.69	37
Control 4	-	4.59	88
Control 5	-	1.73	55
AD1	20	4.40	90
AD2	20	4.11	113
AD3	26	4.95	100
AD4	24	5.84	78
AD5	15	5.74	105

There was a difference between non-dementia patients and Alzheimer's disease, and the difference of Wako's item is larger than competitor's.

****MMSE score: diagnosis Inquiry test score of cognitive function
 30-28 Normal
 27-24 Suspected of mild cognitive impairment
 ≤23 Suspected of dementia

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
High Molecular Amyloid β Oligomer ELISA Kit Wako	298-80101	96 times	for Immunochemistry	Keep at 2-10°C

※Not available for sales in Europe.

For the quantitative determination of A β 40 and A β 42 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 (A β) 40 and 42(43). A β 42 is more prone to aggregate than A β 40. Therefore the initial A β deposition begins with A β 42(43) but not with A β 40.

A β 42(43)-positive and A β 40-negative plaques may represent early-stage diffuse type SPs, and A β 40-positive plaque appears in the advanced stage, especially more often in the cored portion of the mature plaque.

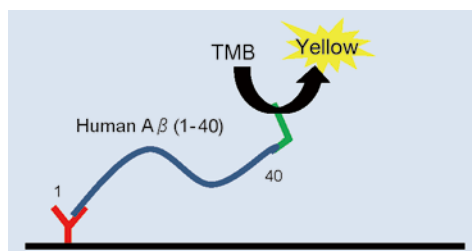
In these kits, we use the monoclonal antibodies which specifically detects A β . Therefore these kits are designed to be used for the quantitative determination of A β in samples such as tissue culture medium, tissue homogenate, CSF and plasma.

Features

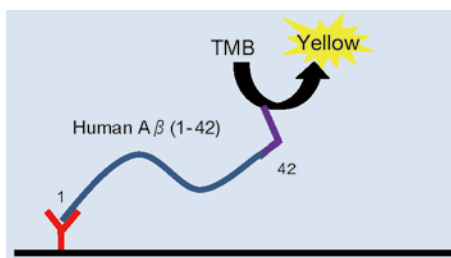
- These kits are designed to be used for the quantitative determination of A β in samples such as tissue culture medium, tissue homogenate, CSF and plasma.
- These kits use the monoclonal antibodies that were developed by Takeda Chemicals Industries, Ltd.

Principle

Determination of Human A β (1-40)



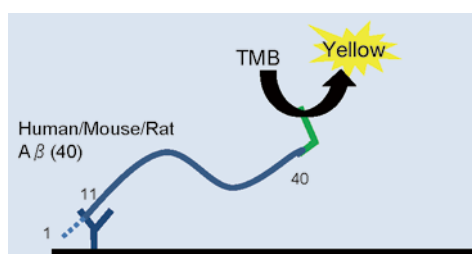
Determination of human A β (1-42)



- Y BAN50 :**
A specific antibody for A β N-terminus
- Y BNT77 :**
A specific antibody for A β 11-28
- Y BA27 :**
A specific antibody for A β 40 C-terminus (Fab' or F(ab')₂)
- Y BC05 :**
A specific antibody for A β 42 C-terminus (Fab')

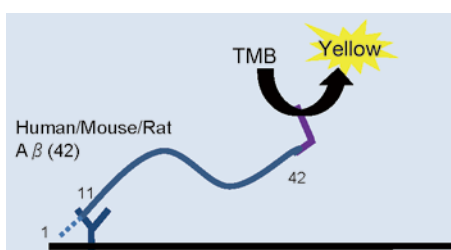
Determination of human/mouse/rat A β (40)*

*: A β (x-40) with a truncated or modified N-terminus



Determination of human/mouse/rat A β (42)*

*: A β (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 μ L
- 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 A β (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 A β (1-42)	Human β Amyloid (1-42) ELISA Kit Wako	0.08	0.1~20.0	298-62401	
	Human β Amyloid (1-42) ELISA Kit Wako, High Sensitive	0.06		296-64401	
Human/mouse/rat A β (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 A β (42)	Human/Rat β Amyloid (42) ELISA Kit Wako	0.19	0.1~20.0	290-62601	
	Human/Rat β Amyloid (42) ELISA Kit Wako, High Sensitive	0.024		292-64501	

Tau ELISA kit *Wako*

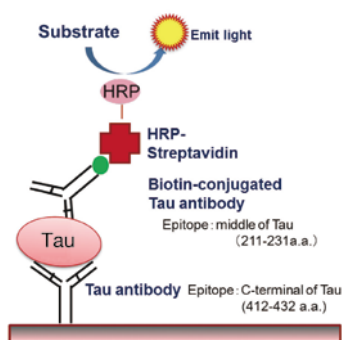
Tau is a microtubule-associated protein that is mainly expressed in neurons in the central nervous system and regulates stability of microtubules. In the brain in patients with Alzheimer's disease, aggregates of phosphorylated Tau or neurofibrillary tangles are formed, and extent of the formation has been reported to be correlated to severity of dementia. Tau, therefore, has been studied to investigate causes of Alzheimer's disease and to development drugs for treating the disease. On the other hand, total Tau and phosphorylated Tau concentrations in cerebrospinal fluid are reported to be higher in Alzheimer's disease patients than in non-demented patients.

This product is an ELISA kit that readily allows measurement of Tau. This kit recognizes any form of Tau irrespective of whether it is phosphorylated or not.

Features

- Small volume
- High sensitive

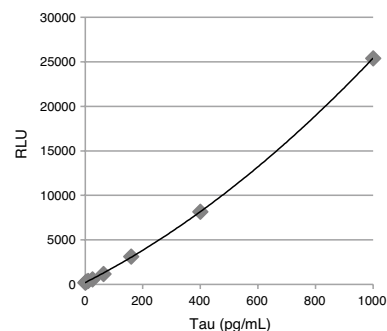
Principal



Performance

Standard curve range	4.1-1000 pg/mL
Reactive Tau	Total Tau
Sample	Human cerebrospinal fluid (CSF)
Sample volume	10 μ L*
Assay time	3 hours
Detection method	Luminescent system

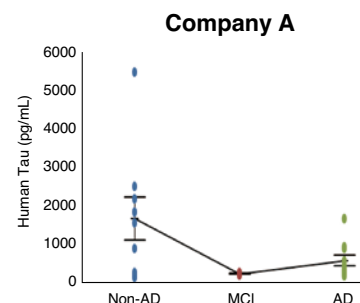
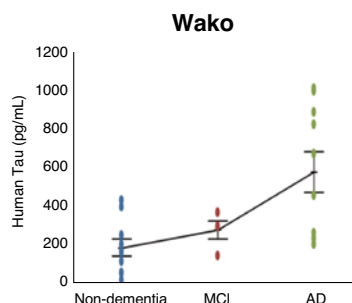
*It is recommended that CSF sample volume is 50 μ L, considering accuracy of dilution.



Measurement of human CSF sample

CSF samples from non-dementia subjects (non-AD), patients with mild cognitive impairment (MCI), and those with Alzheimer's disease (AD) were measured with this ELISA kit and competitor's item.

A difference was observed in measured value between non-dementia subjects and patients with Alzheimer's disease. Wako product showed clearer difference than other company A's product.

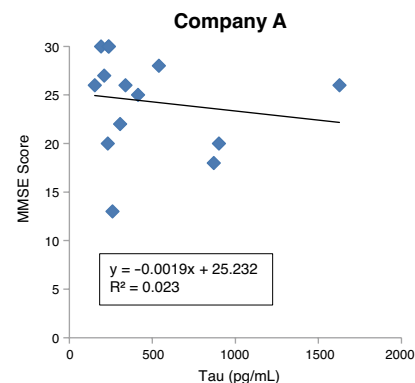
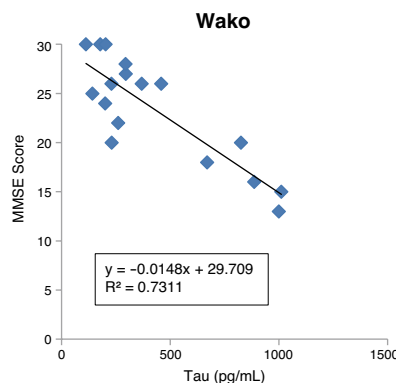


Correlation data with cognitive function diagnostic test (MMSE score)

The correlation between the Tau concentration in CSF measured with this kit and the MMSE score of patients was examined.

≤ 23 points; doubt of dementia
24-27 points; suspected mild cognitive impairment
28-30 points; normal


A correlation was found between Tau concentration and MMSE score. Wako's product showed higher correlation than company A's product.



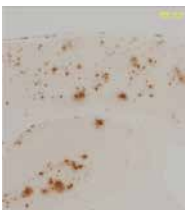
Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
Tau ELISA kit <i>Wako</i>	296-80401	96 tests	for Immunochemistry	Keep at 2-10°C

2. Antibodies and Proteins


Antibodies

Human A β specific antibody						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
017-26871	Anti Human Amyloid β, Monoclonal Antibody (BAN50)			for immunochemistry	10 μ L	Keep at -20°C.
013-26873					50 μ L	
Antibody information						
Antigen	Amyloid β	Application	WB, IP, IHC, ICC, ELISA	Isotype	IgG1- κ	Immunostaining image Brain of Alzheimer's model mouse 
Antigen information	Human Amyloid β 1-16 a.a.	Species cross reactivity	Human	Label	Unlabeled	
Antigen synonyms	A β	Host	Mouse	Clone No.	BAN50	
Summary	Amyloid β (A β) is a peptide which consists of about 40 amino acids. A β is considered the cause of Alzheimer's disease, because it is a major component of senile plaques formed in brains of Alzheimer's disease patients. This item is a mouse monoclonal antibody that reacts with N-terminal of human A β . The antibody was developed by Takeda Pharmaceutical Company Limited.					
References	1) Asami-Odaka, A., et al.: <i>Biochemistry</i> , 34 , 32, 10272 (1995). 2) Sambamurti, K., et al.: <i>J. Biol. Chem.</i> , 274 , 38, 26810 (1999). 3) Fukumoto, H., et al.: <i>J. Neurosci.</i> , 30 , 33, 11157 (2010). 4) Takahara, Y., et al.: <i>J. Neurosci.</i> , 25 , 2, 436 (2005). 5) Iwata, H., et al.: <i>J. Biol. Chem.</i> , 276 , 24, 21678 (2001).					

The data was provided by Kokawa, A., Hashimoto, T., and Iwatsubo, T., Graduate School of Medicine, University of Tokyo in Japan.


A β specific antibody						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
014-26881	Anti Amyloid β, Monoclonal Antibody (BNT77)			for immunochemistry	10 μ L	Keep at -20°C.
010-26883					50 μ L	
Antibody information						
Antigen	Amyloid β	Application	IP, IHC, ELISA	Isotype	IgA- κ	Immunostaining image Brain of Alzheimer's model mouse 
Antigen information	Human Amyloid β 11-28 a.a.	Species cross reactivity	Human, mouse, rat	Label	Unlabeled	
Antigen synonyms	A β	Host	Mouse	Clone No.	BNT77	
Summary	Amyloid β (A β) is a peptide which consists of about 40 amino acids. A β is considered the cause of Alzheimer's disease, because it is a major component of senile plaques formed in brains of Alzheimer's disease patients. This item is a mouse monoclonal antibody that reacts with middle of A β . The antibody was developed by Takeda Pharmaceutical Company Limited.					
References	1) Asami-Odaka, A., et al.: <i>Biochemistry</i> , 34 , 32, 10272 (1995). 2) Tomita, T., et al.: <i>J. Neurosci.</i> , 19 , 24, 10627 (1999). 3) Sudoh, S., et al.: <i>J Neurochem.</i> , 71 , 4, 1535 (1998).					

The data was provided by Kokawa, A., Hashimoto, T., and Iwatsubo, T., Graduate School of Medicine, University of Tokyo in Japan.

A β 40 specific antibody						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
018-26921	Anti Amyloid β 40, Monoclonal Antibody (BA27)			for immunochemistry	10 μ L	Keep at -20°C.
014-26923					50 μ L	
Antibody information						
Antigen	Amyloid β 40	Application	WB, IHC, ELISA	Isotype	IgG2a- κ	Immunostaining image Brain of Alzheimer's model mouse 
Antigen information	Human Amyloid β 1-40a.a.	Species cross reactivity	Human, mouse, rat	Label	Unlabeled	
Antigen synonyms	A β 40	Host	Mouse	Clone No.	BA27	
Summary	Amyloid β (A β) is a peptide which consists of about 40 amino acids. A β is considered the cause of Alzheimer's disease, because it is a major component of senile plaques formed in brains of Alzheimer's disease patients. This item is a mouse monoclonal antibody that reacts with A β 40. The antibody was developed by Takeda Pharmaceutical Company Limited.					
References	1) Asami-Odaka, A., et al.: <i>Biochemistry</i> , 34 , 32, 10272 (1995). 2) Tomita, T., et al.: <i>J. Neurosci.</i> , 19 , 24, 10627 (1999). 3) Iwatsubo, T., et al.: <i>Am J. Pathol.</i> , 149 , 6, 1823 (1996). 4) Nonomura, A., et al.: <i>J. Neuropathol. Exp. Neurol.</i> , 59 , 11, 1011 (2000).					

The data was provided by Kokawa, A., Hashimoto, T., and Iwatsubo, T., Graduate School of Medicine, University of Tokyo in Japan.

A β 42 specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition		
014-26901	Anti Amyloid β42 (43), Monoclonal Antibody (BC05)	for immunochemistry	10 μ L	Keep at -20°C.		
010-26903			50 μ L			
Antibody information						
Antigen	Amyloid β 42 Amyloid β 43	Application	WB, IHC, ELISA	Isotype	IgG1· κ	Immunostaining image Brain of Alzheimer's model mouse 
Antigen information	Human Amyloid β 35-43a.a.	Species cross reactivity	Human, mouse, rat	Label	Unlabeled	
Antigen synonyms	A β 42 A β 43	Host	Mouse	Clone No.	BC05	
Summary	Amyloid β (A β) is a peptide which consists of about 40 amino acids. A β is considered the cause of Alzheimer's disease, because it is a major component of senile plaques formed in brains of Alzheimer's disease patients. This item is a mouse monoclonal antibody that reacts with A β 42 and A β 43. The antibody was developed by Takeda Pharmaceutical Company Limited.					
References	1) Asami-Odaka, A., et al.: <i>Biochemistry</i> , 34 , 32, 10272 (1995). 2) Tomita, T., et al.: <i>J. Neurosci.</i> , 19 , 24, 10627 (1999). 3) Iwatsubo, T., et al.: <i>Am J. Pathol.</i> , 149 , 6, 1823 (1996). 4) Nonomura, A., et al.: <i>J. Neuropathol. Exp. Neurol.</i> , 59 , 11, 1011 (2000).					
					<i>The data was provided by Kokawa, A., Hashimoto, T., and Iwatsubo, T., Graduate School of Medicine, University of Tokyo in Japan.</i>	

Tau specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
011-26891	Anti Human/Mouse/Rat Tau, Rat Monoclonal Antibody (RTM38)	for immunochemistry	10 μ L	Keep at -20°C.	
017-26893			50 μ L		
Antibody information					
Antigen	Tau	Application	WB, IHC, ICC	Isotype	IgG2a· κ
Antigen information	Human full length Tau ON4R isoform	Species cross reactivity	Human, mouse, rat	Label	Unlabeled
Antigen synonyms	MAPT, Microtubule-Associated Protein Tau	Host	Rat	Clone No.	RTM38
Summary	Tau is a microtubule-associated protein, mainly expressed in neurons in the central nervous system, and regulates stabilization of microtubules. In the brain of Alzheimer's disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of these tangles correlates to the severity of dementia. Based on this finding, Tau has been investigated to find out the etiology and to discover drugs for Alzheimer's disease. This product is a rat monoclonal antibody that specifically recognizes human, mouse and rat Tau.				


Human Tau specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
019-26951	Anti Human Tau, Rat Monoclonal Antibody (RTM49)	for immunochemistry	10 μ L	Keep at -20°C.	
015-26953			50 μ L		
Antibody information					
Antigen	Tau	Application	WB, IHC, ICC	Isotype	IgG1· κ
Antigen information	Human full length Tau ON4R isoform	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	MAPT, Microtubule-Associated Protein Tau	Host	Rat	Clone No.	RTM49
Summary	Tau is a microtubule-associated protein, mainly expressed in neurons in the central nervous system, and regulates stabilization of microtubules. In the brain of Alzheimer's disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of these tangles correlates to the severity of dementia. Based on this finding, Tau has been investigated to find out the etiology and to discover drugs for Alzheimer's disease. This product is a rat monoclonal antibody that specifically recognizes human Tau.				

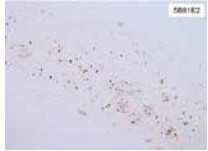
Mouse Tau specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
016-26961	Anti Mouse Tau, Rat Monoclonal Antibody (RTM47)	for immunochemistry	10 μ L	Keep at -20°C.	
012-26963			50 μ L		
Antibody information					
Antigen	Tau	Application	WB, IHC, ICC	Isotype	IgG2b· κ
Antigen information	Mouse Tau full length	Species cross reactivity	Mouse	Label	Unlabeled
Antigen synonyms	MAPT, Microtubule-Associated Protein Tau	Host	Rat	Clone No.	RTM47
Summary	Tau is a microtubule-associated protein, mainly expressed in neurons in the central nervous system, and regulates stabilization of microtubules. In the brain of Alzheimer's disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of these tangles correlates to the severity of dementia. Based on this finding, Tau has been investigated to find out the etiology and to discover drugs for Alzheimer's disease. This product is a rat monoclonal antibody that specifically recognizes mouse Tau.				

Phosphorylated Tau (T181) specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
012-26603	Anti Phosphorylated Tau T181, Rat Monoclonal Antibody (2E2-A6)	for immunochemistry	10 µL	Keep at -20°C.	
016-26601			50 µL		
Antibody information					
Antigen	Tau pT181	Application	WB, IHC	Isotype	IgG2b-κ
Antigen information	171-191 a.a of Human Tau with pT181.	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	MAPT Microtubule-Associated Protein Tau	Host	Rat	Clone No.	2E2-A6
Summary	Tau is a microtubule-associated protein, mainly expressed in neurons in central nervous system, and regulates stabilization of microtubules. In the brain of Alzheimer's disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of these tangles correlates to the severity of dementia. Based on this finding, Tau has been investigated to find out the etiology and to discover drugs for Alzheimer's disease. This product is an antibody that specifically recognizes Tau with phosphorylated threonine at position 181 (pT181).				 <p>The data was provided by Miyasaka, T., Doshisha University in Japan.</p>


Phosphorylated Tau (S199) specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
019-26613	Anti Phosphorylated Tau S199, Rat Monoclonal Antibody (5B8-1E2)	for immunochemistry	10 µL	Keep at -20°C.	
013-26611			50 µL		
Antibody information					
Antigen	Tau pT199	Application	WB, IHC	Isotype	IgG2a-κ
Antigen information	189-209 a.a of human Tau with pS199.	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	MAPT Microtubule-Associated Protein Tau	Host	Rat	Clone No.	5B8-1E2
Summary	Tau is a microtubule-associated protein, mainly expressed in neurons in central nervous system, and regulates stabilization of microtubules. In the brain of Alzheimer's disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of these tangles correlates to the severity of dementia. Based on this finding, Tau has been investigated to find out the etiology and to discover drugs for Alzheimer's disease. This product is an antibody that specifically recognizes Tau with phosphorylated serine at position 199 (pS199).				 <p>The data was provided by Miyasaka, T., Doshisha University in Japan.</p>

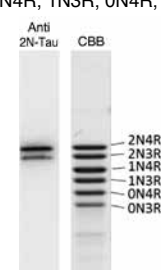
Phosphorylated Tau (S262) specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
014-27121	Anti Phosphorylated Tau S262, Rat Monoclonal Antibody (TIP1-35)	for immunochemistry	10 µL	Keep at -20°C.	
010-27123			50 µL		
Antibody information					
Antigen	Tau pS262	Application	WB, ICC, ELISA	Isotype	IgG1-λ
Antigen information	252-272 a.a of human Tau with pS262.	Species cross reactivity	Human, monkey	Label	Unlabeled
Antigen synonyms	MAPT Microtubule-Associated Protein Tau	Host	Rat	Clone No.	TIP1-35
Summary	Tau is a microtubule-associated protein, mainly expressed in neurons in central nervous system, and regulates stabilization of microtubules. In the brain of Alzheimer's disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of these tangles correlates to the severity of dementia. Based on this finding, Tau has been investigated to find out the etiology and to discover drugs for Alzheimer's disease. This product is an antibody that specifically recognizes Tau with phosphorylated serine at position 262 (pS262).				

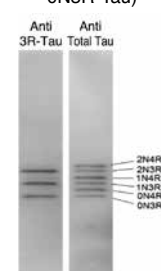
Phosphorylated Tau (S422) specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
016-27681	Anti Phosphorylated Tau S422, Monoclonal Antibody (AP422)	for immunochemistry	10 µL	Keep at -20°C.	
012-27683			50 µL		
Antibody information					
Antigen	Tau pS422	Application	WB, IHC	Isotype	IgG1-κ
Antigen information	CGG+417-427a.a. of human tau with pS422	Species cross reactivity	Human, mouse	Label	Unlabeled
Antigen synonyms	MAPT Microtubule-Associated Protein Tau	Host	Mouse	Clone No.	AP422
Summary	Tau is a microtubule-associated protein, mainly expressed in neurons in central nervous system, and regulates stabilization of microtubules. In the brain of Alzheimer's disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of these tangles correlates to the severity of dementia. Based on this finding, Tau has been investigated to find out the etiology and to discover drugs for Alzheimer's disease. This product is an antibody that specifically recognizes Tau with phosphorylated serine at position 422 (pS422).				 <p>The data was provided by Dr. Hasegawa, M., Tokyo Metropolitan Institute of Medical Science in Japan.</p>
References	1) Hasegawa, M., et al.: <i>FEBS Lett.</i> , 384 , 1, 25 (1996). 2) Goedert, M., et al.: <i>FEBS Lett.</i> , 409 , 1, 57 (1997). 3) Bue'e-Scherrer, V., et al.: <i>FEBS Lett.</i> , 515 , 1, 151 (2002). 4) Delobel, P., et al.: <i>J. Neurochem.</i> , 83 , 2, 412 (2002). 5) Bellucci, A., et al.: <i>Am. J. Pathol.</i> , 165 , 5, 1643 (2004). 6) Sylvie, L. C., et al.: <i>PNAS</i> , 103 , 25, 9673 (2006). 7) Schindowski, K., et al.: <i>Am. J. Pathol.</i> , 169 , 2, 599 (2006). 8) Audouard, E., et al.: <i>Am. J. Pathol.</i> , 186 , 10, 2709 (2016).				

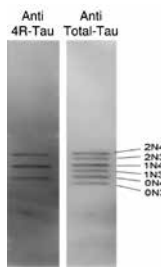
2N-Tau specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
017-27351	Anti 2N-Tau, Rat Monoclonal Antibody (2C2)	for immunochemistry	10 µL	Keep at -20°C.	
013-27353			50 µL		
Antibody information					
Antigen	2N-Tau	Application	WB, IHC	Isotype	IgM·κ
Antigen information	Human Tau full length	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	MAPT, Microtubule-Associated Protein Tau	Host	Rat	Clone No.	2C2
Summary	<p>Tau is a microtubule-associated protein, mainly expressed in neurons in the central nervous system, and regulates stabilization of microtubules. In the brain of Alzheimer's disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of these tangles correlates to severity of dementia. Based on this finding, Tau has been investigated to find out the etiology and to discover drugs for Alzheimer's disease. Tau has 6 isoforms: 2N4R (Tau-441), 2N3R (Tau-410), 1N4R (Tau-412), 1N3R (Tau-381), 0N4R (Tau-383), and 0N3R (Tau-352). This product is an antibody that specifically recognizes 2N4R and 2N3R Tau isoforms.</p>				<p>WB image</p> <p>Human taurecombinant mixtures (2N4R, 2N3R, 1N4R, 1N3R, 0N4R, 0N3R-Tau)</p>  <p>The data was provided Miyasaka, T., Doshisha University in Japan.</p>

3-Repeat Tau (3R-Tau) specific antibody

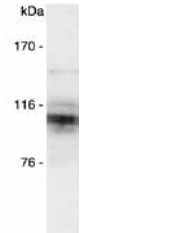
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
012-26583	Anti 3R-Tau, Rat Monoclonal Antibody (2A1-1F4)	for immunochemistry	10 µL	Keep at -20°C.	
016-26581			50 µL		
Antibody information					
Antigen	3R-Tau	Application	WB, IP	Isotype	IgG2b·λ
Antigen information	Human Tau 267-274, 306-313a.a.	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	MAPT, Microtubule-Associated Protein Tau	Host	Rat	Clone No.	2A1-1F4
Summary	<p>Tau is a microtubule-associated protein, mainly expressed in neurons in the central nervous system, and regulates stabilization of microtubules. In the brain of Alzheimer's disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of these tangles correlates to the severity of dementia. Based on this finding, Tau has been investigated to find out the etiology and to discover drugs for Alzheimer's disease. Tau is classified into 3R-Tau and 4R-Tau which has 3 and 4 microtubules associated domains, respectively, This product is an antibody that specifically recognizes 3R-Tau.</p>				<p>WB image</p> <p>Human tau recombinant mixtures (2N4R, 2N3R, 1N4R, 1N3R, 0N4R, 0N3R-Tau)</p>  <p>The data was provided Miyasaka, T., Doshisha University in Japan.</p>

4 Repeat Tau (4R-Tau) specific antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
019-26593	Anti 4R-Tau, Monoclonal Antibody (3E8-1A6)	for immunochemistry	10 µL	Keep at -20°C.	
013-26591			50 µL		
Antibody information					
Antigen	4R-Tau	Application	WB, IP	Isotype	IgG1·κ
Antigen information	Human Tau 273-291a.a.	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	MAPT, Microtubule-Associated Protein Tau	Host	Mouse	Clone No.	3E8-1A6
Summary	<p>Tau is a microtubule-associated protein, mainly expressed in neurons in the central nervous system, and regulates stabilization of microtubules. In the brain of Alzheimer's disease patients, neurofibrillary tangles are formed which are composed of accumulated phosphorylated forms of Tau. The degree of these tangles correlates to the severity of dementia. Based on this finding, Tau has been investigated to find out the etiology and to discover drugs for Alzheimer's disease. Tau is classified into 3R-Tau and 4R-Tau which has 3 and 4 microtubules associated domains, respectively, This product is an antibody that specifically recognizes 4R-Tau.</p>				<p>WB image</p> <p>Human tau recombinant mixtures (2N4R, 2N3R, 1N4R, 1N3R, 0N4R, 0N3R-Tau)</p>  <p>The data was provided Miyasaka, T., Doshisha University in Japan.</p>

Amyloid β related factor APP antibody

Wako Cat. No.	Product Name		Grade	Pkg. Size	Storage Condition
014-27241	Anti Amyloid Precursor Protein, Monoclonal Antibody (3E9)		for immunochemistry	10 μ L	Keep at -20°C.
010-27243				50 μ L	
Antibody information					
Antigen	Amyloid precursor protein	Application	WB	Isotype	IgG1
Antigen information	Synthetic peptide corresponding to 18-38 amino acid of APP695	Species cross reactivity	Mouse, Human	Label	Unlabeled
Antigen synonyms	APP	Host	Mouse	Clone No.	3E9
Summary	Amyloid β (A β) is considered a possible cause of Alzheimer's disease, because it is the major component of senile plaques. A β is produced when the amyloid precursor protein (APP) is cleaved by α -secretase and β -secretase. APP belongs to an evolutionary conserved gene family including amyloid precursor-like proteins (APPL1 and APPL2). This item is a mouse monoclonal antibody which reacts with APP.				



Alzheimer's disease related factor ApoE4 antibody

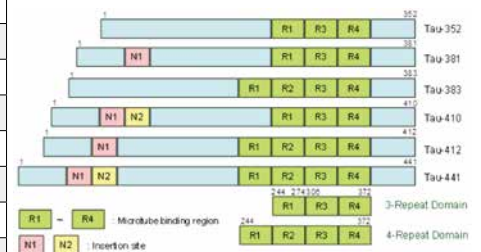
Wako Cat. No.	Product Name		Grade	Pkg. Size	Storage Condition
018-27261	Anti Human Apolipoprotein E4, Monoclonal Antibody (1F9)		for immunochemistry	10 μ L	Keep at -20°C.
014-27263				50 μ L	
Antibody information					
Antigen	Apolipoprotein E4	Application	WB, IHC	Isotype	IgG1
Antigen information	Synthetic peptide corresponding to 109-119 amino acid of human apolipoprotein E4	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	ApoE4	Host	Mouse	Clone No.	1F9
Summary	Apolipoprotein E (ApoE) is a glycoprotein about 34kDa. ApoE has three isoforms, ApoE2, E3, and E4. ApoE4 is a risk factor for Alzheimer's disease. This item is a mouse monoclonal antibody which reacts with ApoE4.				

Immunostaining image (Alzheimer's disease patient brain cortex)



Proteins

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



3. 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

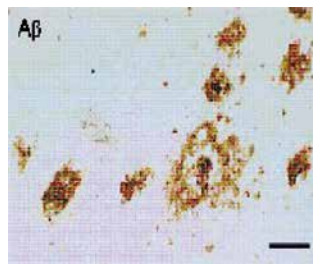
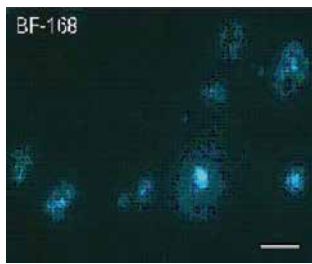
- Staining complete in 10 min
- Cost-effective

Applications

BF-168

Senile plaque-selective fluorescent probe

BF-168

Staining with anti-A β antibody

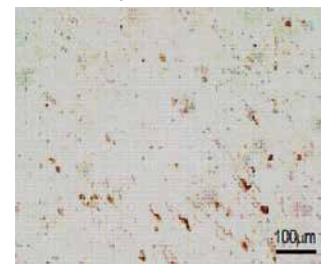
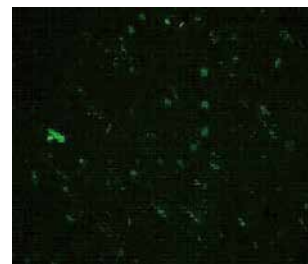
→ BF-168 is equally effective as anti-A β antibody in staining of senile plaques (A β).

BF-170

Neurofibrillary tangle change-selective fluorescent probe

BF-170

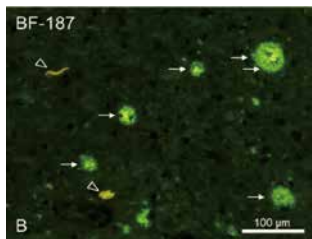
Staining with anti-phosphorylated Tau antibody



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

BF-187

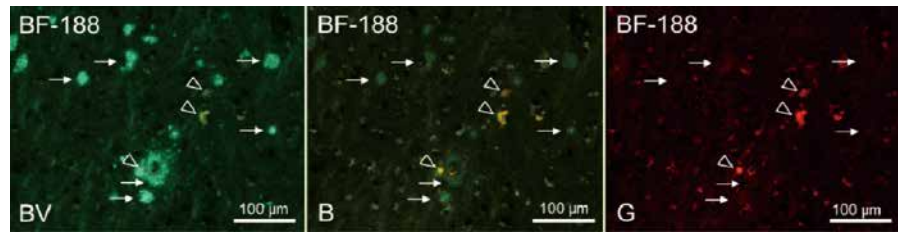
Senile plaque/neurofibrillary tangle dual target probe



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

BF-188

Senile plaque/neurofibrillary tangle dual target probe



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

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

(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 (A β)-selective	Neurofibrillary tangle change (pTau)-selective	Stains senile plaque (A β) & neurofibrillary tangle change (pTau)	Stains senile plaque (A β) and neurofibrillary tangle change (pTau), respectively with different colors .
Senile plaque (A β)	○ (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., <i>et al.</i> : Quinoline and benzimidazole derivatives: candidate probes for in vivo imaging of tau pathology in Alzheimer's disease, <i>J. Neurosci.</i> , 25 , 10857-10862 (2005). 2) Kuwabara, Y., <i>et al.</i> : Impairments of long-term depression induction and motor coordination precede A β accumulation in the cerebellum of APP ^{swE} /PS1 ^{dE9} double transgenic mice, <i>J. Neurochem.</i> , 130 (3), 432-443 (2014).		1) Harada, R., <i>et al.</i> : Use of benzimidazole derivative BF-188 in fluorescence multispectral imaging for selective visualization of Tau protein fibrils in the Alzheimer's disease brain, <i>Molecular Imaging and Biology</i> , 16 (1), 19-27, 2014.	1) Harada, R., <i>et al.</i> : Use of benzimidazole derivative BF-188 in fluorescence multispectral imaging for selective visualization of Tau protein fibrils in the Alzheimer's disease brain, <i>Molecular Imaging and Biology</i> , 16 (1), 19-27, 2014.

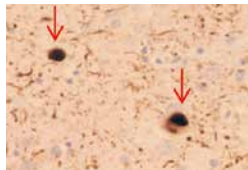
Product Name	Wako Cat. No.	Package Size*	Grade	Storage Condition
BF-168	029-16361	1 mg	for Cellbiology	Keep at -20°C.
BF-170	026-16371	1 mg		
BF-187	022-18811	1 mg		
BF-188	025-18801	1 mg		


*: 1mg corresponds to abt. 100 slides

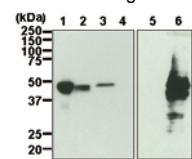
Please visit the Wako Online Catalog: <http://www.e-reagent.com>

C. Parkinson's Disease Research

1. Antibodies

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 μ L	Keep at -20°C.
Antibody information						
Antigen	α -synuclein pSer129	Application	WB, IHC, ICC	Isotype	IgG	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
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.,: <i>Nature Cell Biology</i> , 4 , 160 (2002). 2) Saito, Y.,: <i>Journal of Neuropathology and Experimental Neurology</i> , 62 , 644 (2003).					

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 μ L	Keep at 2-10°C.
Antibody information						
Antigen	α -synuclein pS129	Application	IHC/ICC	Isotype	IgG	Image of immunohistological stain, brain section of Mouse  Brown: Phosphorylated α -synuclein Data provided: Courtesy of Kuwabara and Iwatsubo at Graduate School of Medicine and Faculty of Medicine, The University of Tokyo
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).					

Parkinson's disease related factor Parkin antibody						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
010-27341	Anti Parkin, Monoclonal Antibody (Par6)			for immunochemistry	10 μ L	Keep at -20°C.
016-27343					50 μ L	
Antibody information						
Antigen	Parkin	Application	WB	Isotype	IgG2- κ	WB image  Lane1: Rat brain lysate Lane2: Mouse brain lysate Lane3: PC12 cell Lane4: HeLa cell Lane5: HEK293T cell Lane6: HEK293T cell express Human Parkin
Antigen information	Full length recombinant human Parkin	Species cross reactivity	Human, mouse, rat	Label	Unlabeled	
Antigen synonyms	PRKN, Parkin RBRE4 ubiquitin protein ligase	Host	Mouse	Clone No.	Par6	
Summary	Parkin is an ubiquitin protein ligase about 50kDa that is a 465 amino acid with N-terminal ubiquitin-like domain. Parkin is a familial Parkinson disease (PD) gene product. PD is one of the most frequency neurodegenerative diseases. This item is a mouse monoclonal antibody which reacts with Parkin.					

2. Proteins

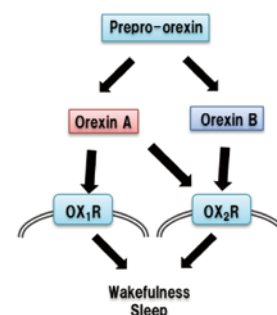
Synucleins						
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	Product outline	
190-17941	α-Synuclein, Human, recombinant	for Cellbiology	0.5 mg	Keep at -20°C.	<ul style="list-style-type: none"> •Appearance: Lyophilized •Storage buffer before lyophilization: 20 mmol/L Ammonium Bicarbonate •Host: <i>Escherichia coli</i> •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 x His-tagged 	
197-17951	β-Synuclein, Human, recombinant		0.5 mg			
194-17961	γ-Synuclein, Human, recombinant		0.5 mg			

D. Sleep Disorder Research

1. ELISA Kit

Orexin A ELISA Kit

Orexin is a neuropeptide that controls sleep and wakefulness, and has two types, Orexin A and Orexin B. Orexin A is decreased remarkably in the cerebrospinal fluid of patients with narcolepsy, a sleep disorder. Orexin A is generally measured by radioimmunoassay (RIA). However, dedicated equipment is required for RIA, and there are few institutions that can measure Orexin A. This product is an ELISA kit which can conveniently measure Orexin A in human cerebrospinal fluid and rat cerebrospinal fluid, serum, plasma without using radioisotope.



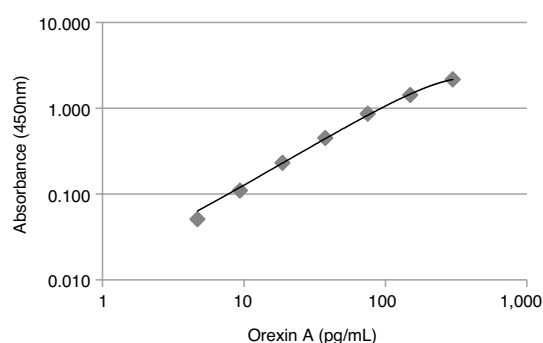
Features

- No radioisotope required
- High sensitivity (4.69-300pg/mL)
- Small sample volume (25µL)

Performance

Standard Curve	4.69~300pg/mL
Sample	Human cerebrospinal fluid Rat cerebrospinal fluid Rat serum Rat plasma
Sample volume	25µL
Duration of measurement	About 20 hours
Within-run reproducibility	CV<5%
Between-run reproducibility	CV<16%

Standard curve



Measurement examples -recovery test-

	No addition	Orexin A (5 pg/mL)		Orexin A (20 pg/mL)		Orexin A (100 pg/mL)	
	Measured value (pg/mL)	Measured value (pg/mL)	Recovery	Measured value (pg/mL)	Recovery	Measured value (pg/mL)	Recovery
Rat Cerebrospinal fluid [1]	51.82	54.96	96.7%	63.74	88.8%	120.77	79.6%
Rat Cerebrospinal fluid [2]	47.69	55.55	105.4%	63.40	93.7%	109.95	74.5%
Rat Cerebrospinal fluid [3]	38.05	43.99	102.2%	59.12	101.8%	101.16	73.3%
Human Cerebrospinal fluid [1]	12.25	14.29	82.8%	23.25	72.1%	65.16	58.1%
Human Cerebrospinal fluid [2]	47.21	50.45	96.6%	55.71	82.9%	107.12	72.8%
Human Cerebrospinal fluid [3]	24.41	25.99	88.4%	35.07	79.0%	83.51	67.1%
Rat Serum [1]	Not detected	5.64	112.8%	19.94	99.7%	89.58	89.6%
Rat Serum [2]	6.42	12.26	107.4%	25.05	94.8%	93.60	88.0%
Rat Plasma [1]	1.45	6.81	105.6%	20.30	94.6%	91.13	89.8%
Rat Plasma [2]	2.28	7.20	98.9%	21.64	97.1%	90.51	88.5%

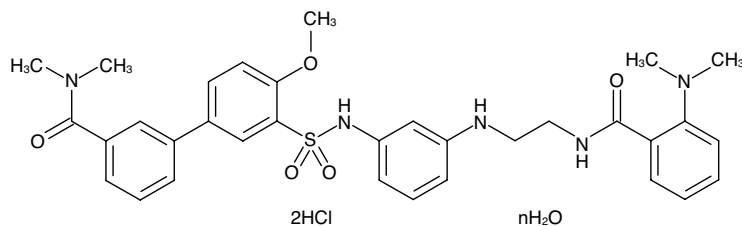
High quantitative data were obtained in human and rat samples.

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
Orexin A ELISA Kit Wako	293-79801	96 times	for Immunochemistry	Keep at 2-10°C.

2. Low-Molecule Compound

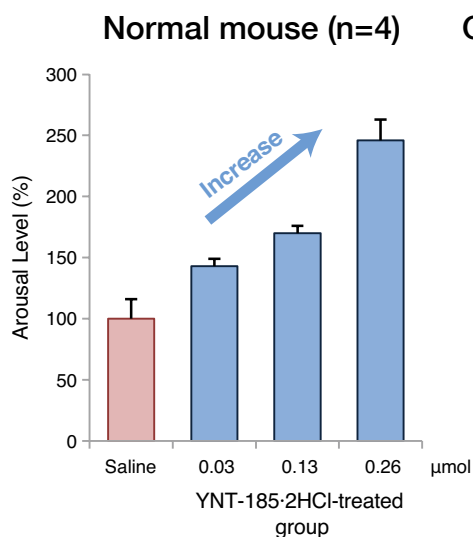
Non-peptide Orexin 2 Receptor Agonist YNT-185·2HCl

YNT-185·2HCl is non-peptide orexin receptor 2 (OX2R) agonist. Orexins are family of neuropeptides, which are secreted by orexin-producing nerve present in the hypothalamus. There are two variants, orexin receptors exist as two types of receptors, type 1 and type 2. In particular, the orexin 2 receptor is involved in sleep-wake regulation, and orexin deficiency in the brain causes narcolepsy, a sleep disorder manifesting as an unbearable sleepiness during the day. Although it has been reported that intraventricular administration of orexin leads to symptom alleviation in narcolepsy mouse models, therapeutic effects cannot be expected unless it is administered into the brain, due to orexin being a peptide and being unable to pass through the blood-brain barrier. Intraventricular or intraperitoneal administration of YNT-185·2HCl has been shown to extend wake time, and has also been reported to improve the symptoms of narcolepsy mouse models.

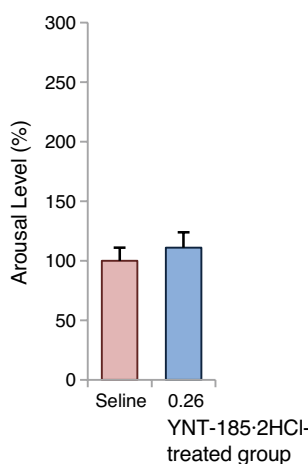


$C_{33}H_{37}N_5O_5S \cdot 2HCl \cdot nH_2O$
($C_{33}H_{37}N_5O_5S \cdot 2HCl = 688.66$)
CAS No. 1804978-82-2 (anhydride)

Wake-Promoting Effect



Orexin receptor-deficient mouse (n=3)



(Data was provided by Yanagisawa M., Nagase H. and Funato H. at International Institute for Integrative Sleep Medicine (WPI-IIS), University of Tsukuba)

References

- 1) Nagahara, T. *et al.* : *J. Med. Chem*, **58**, 7931 (2015).
- 2) Irukayama-Tomobe, Y. *et al.*: *Proc. Natl. Acad. Sci. USA*, **114** (22), 573 (2017).

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
YNT-185 Dihydrochloride Hydrate	254-00641 250-00643	5 mg 100 mg	for Cellbiology	Keep at -20°C.

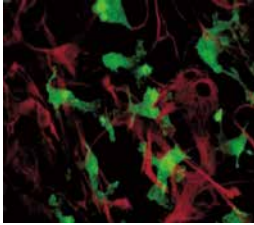
Orexins -Related Products-

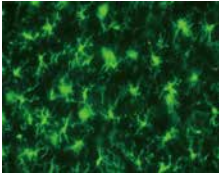
Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
Orexin A (Human)	159-03161	0.1 mg	for Cellbiology	Keep at -20°C.
Orexin B (Human)	156-03171	0.1 mg	for Cellbiology	Keep at -20°C.
Orexin B (Rat, Mouse)	153-03181	0.1 mg	for Cellbiology	Keep at -20°C.

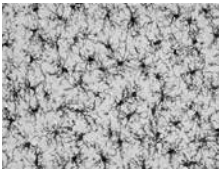
E. Antibodies

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 Immunocytochemistry	50 µg	Keep at -20°C.
Antibody information						
Antigen	Iba1	Application	IHC (F)/ICC	Isotype	IgG	Image of a double stain in rat primary mixed culture cells Green: Iba1 (microglia) Red: GFAP (astrocyte) 
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.: <i>Brain Res.Mol. Brain Res.</i> , 57 , 1 (1998). 2) Kanazawa, H., Ohsawa, K., Sasaki, Y., Kohsaka, S. and Imai, Y.: <i>J. Biol. Chem.</i> , 277 , 20026 (2002).					Data provided: Courtesy of Kosaka and Osawa, Dept. of Neurochemistry, National Institute of Neuroscience, NCNP

Microglia marker -Iba1 antibody-						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
013-27691	Anti Iba1, Rabbit (for Paraffin Section)			for immunocytochemistry	50 µg	Keep at -20°C.
Antibody information						
Antigen	Iba1	Application	IHC (P)	Isotype	IgG	Immunostaining image rat brain 
Antigen information	C-terminal of Iba1	Species cross reactivity	Mouse, rat	Label	Unlabeled	
Antigen synonyms	AIF1, IRT1	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 system. This antibody is suitable for paraffin section.					

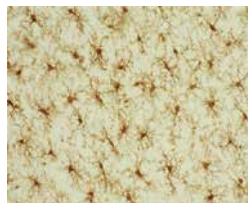
Microglia marker -Iba1 monoclonal antibody-						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
012-26723	Anti Iba1, Monoclonal Antibody (NCNP24)			for immunocytochemistry	10 µL	Keep at -20°C.
016-26721					50 µL	
Antibody information						
Antigen	Iba1	Application	IHC (F)	Isotype	IgG1·κ	Immunostaining image rat brain cortex 
Antigen information	C-terminal of Iba1	Species cross reactivity	Mouse, rat, marmoset	Label	Unlabeled	
Antigen synonyms	AIF1, IRT1	Host	Mouse	Clone No.	NCNP24	
Summary	Iba1 is a protein highly expressed in microglia and macrophages with a molecular weight of about 16.7kDa. The protein is a commonly known microglial marker in the nervous system. This item is a mouse monoclonal antibody that reacts with Iba1.					
References	1) Wan, S., et al.: <i>J. Neuroinflammation</i> , 15 , 31 (2018). 2) Chen, Y. J., et al.: <i>Ann. Clin. Transl. Neurol.</i> , 5 , 2, 147 (2018).					The data was provided by Sanagi, T., Manabe, T., Ichinohe, N., and Kohsaka, S., National Center of Neurology and Psychiatry in Japan.

E

Antibodies

Microglia marker -human Iba1 monoclonal antibody-					
Wako Cat. No.	Product Name		Grade	Pkg. Size	Storage Condition
017-27591	Anti Human Iba1, Monoclonal Antibody (NCNP27)		for immunochemistry	10 µL	Keep at -20°C.
013-27593				50 µL	
Antibody information					
Antigen	Iba1	Application	IHC (P)	Isotype	IgG2b
Antigen information	C-terminal of Iba1	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	AIF1, IRT1	Host	Mouse	Clone No.	NCNP27
Summary	Iba1 is a protein highly expressed in microglia and macrophages with a molecular weight of about 16.7kDa. The protein is a commonly known microglial marker in the nervous system. This item is a mouse monoclonal antibody that reacts with Iba1.				

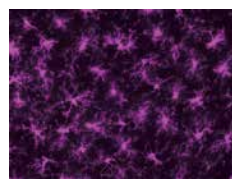
Microglia marker -biotin labeled Iba1 antibody-					
Wako Cat. No.	Product Name		Grade	Pkg. Size	Storage Condition
016-26461	Anti Iba1, Rabbit, Biotin-conjugated		for immunochemistry	100 µL	Keep at 2-10°C.
Antibody information					
Antigen	Iba1	Application	IHC (F)	Isotype	IgG
Antigen information	C-terminal of Iba1	Species cross reactivity	Mouse, rat	Label	Biotin
Antigen synonyms	AIF1, IRT1	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 system. Anti Iba1, Rabbit, Biotin-conjugated is Anti Iba1, Rabbit (for Immunocytochemistry) : Code No. 019-19741, labeled with Biotin.				
References	1) Jones, M. E., et al.: <i>Brain Behav. Immun.</i> , 67 , 355 (2018).				



Immunostaining image rat brain cortex

The data was provided by Sanagi, T., Manabe, T., Ichinohe, N., and Kohsaka, S., National Center of Neurology and Psychiatry in Japan.

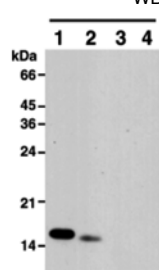
Microglia marker -Red Fluorochrome (635) labeled Iba1 antibody-					
Wako Cat. No.	Product Name		Grade	Pkg. Size	Storage Condition
013-26471	Anti Iba1, Rabbit, Red Fluorochrome (635) -conjugated		for immunochemistry	100 µL	Keep at 2-10°C.
Antibody information					
Antigen	Iba1	Application	IHC (F)	Isotype	IgG
Antigen information	C-terminal of Iba1	Species cross reactivity	Mouse, rat	Label	Red Fluorochrome (635) (Ex=634, Em=654 nm)
Antigen synonyms	AIF1, IRT1	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 commonly known as a microglial marker in the nervous system. Anti Iba1, Rabbit, Red Fluorochrome (635) -conjugated is Anti Iba1, Rabbit (for Immunocytochemistry) : Code No. 019-19741, labeled with a red fluorochrome (635) (Excitation=634nm, Emission=654nm) like Cy5™.				



Immunostaining image rat brain cortex

The data was provided by Sanagi, T., Manabe, T., Ichinohe, N., and Kohsaka, S., National Center of Neurology and Psychiatry in Japan.

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.: <i>Brain Res. Mol. Brain Res.</i> , 57 , 1 (1998). 2) Kanazawa, H., Ohsawa, K., Sasaki, Y., Kohsaka, S. and Imai, Y.: <i>J. Biol. Chem.</i> , 277 , 20026 (2002).				



WB image

1 2 3 4

kDa 66- 45- 36- 24- 21- 14-

Lane1: Iba1 20ng
Lane2: Rat Microglia 10 µg
Lane3: Rat Neuron 10 µg
Lane4: Rat adult brain 10 µg

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

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

2. Tau and Amyloid β

Please see the page No.16-20 for the detailed information.

3. Synucleins

Please see the page No.20 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 Immunocytochemistry	100 μ g	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	<p>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.</p> <p>This product is a monoclonal antibody that recognizes the IDH2.</p>				

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 Immunocytochemistry	100 μ g	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	<p>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.</p> <p>This product is a monoclonal antibody that recognizes the IDH1-R132H, which is a mutated form of human IDH1.</p>				
References	Takano, S., et al.: <i>Brain Tumor Pathol.</i> , 28 , 115 (2011).				

E


Antibodies


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 Immunocytochemistry	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. <i>et al.</i> : <i>Biochem. Biophys. Res. Commun.</i> , 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 Immunocytochemistry	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 podoplanin, 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., <i>et al.</i> : <i>Acta. Histochem. Cytochem.</i> 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 Immunocytochemistry	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 podoplanin, 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., <i>et al.</i> : <i>Acta. Histochem. Cytochem.</i> 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 Immunochimistry	100 µL	Keep at -20°C
Antibody information						
Antigen	GAP-43 pSer96	Application	WB/IHC	Isotype	IgG1	Image of immunostaining (injured rat sciatic nerve) 
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.	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.					
References	Kawasaki, A., <i>et al.</i> : <i>iScience</i> , 4 , 190 (2018).					

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 Immunochimistry	100 µL	Keep at -20°C.
Antibody information						
Antigen	GAP-43 pSer96	Application	WB/IHC	Isotype	IgG1	Image of immunostaining (Mouse spinal marrow 7 days after injury) 
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	1) Kanekiyo, K., <i>et al.</i> : <i>Restor. Neurol. Neurosci.</i> , 34 , 3, 347 (2016). 2) Kawasaki, A., <i>et al.</i> : <i>iScience</i> , 4 , 190 (2018).					

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 Immunochimistry	100 µL	Keep at -20°C.
Antibody information						
Antigen	GAP-43 pThr172	Application	IHC	Isotype	IgG1	Image of immunostaining (Mouse spinal marrow 7 days after injury) 
Antigen information	Amino acid residue (164-177) of GAP-43 with phosphorylated threonine at position 172 (CVTDAAATpTPAAED)	Species cross reactivity	Mouse, rat, human	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.					
References	Kawasaki, A., <i>et al.</i> : <i>iScience</i> , 4 , 190 (2018).					

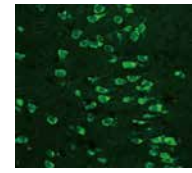
References on growth cone markers:

- Motohiro, N., *et al.*: Identification of functional marker proteins in the mammalian growth cone, *PNAS*, **16** (40), 17211-17216 (2009).
- 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 Immunochimistry	50µL	Keep at -80°C.
Antibody information					
Antigen	5-HT _{1A} Receptor	Application	IHC, FC	Isotype	IgG2b-κ
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.				
References	Yoshimura, Y., et al.: <i>Neurosci. Res.</i> , 115 , 13 (2017).				

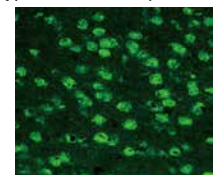
Image of immunohistological stain
Wild type mouse brain prefrontal area



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 Immunochimistry	50 µL	Keep at -20°C.
Antibody information					
Antigen	5-HT _{2C} Receptor	Application	IHC, FC	Isotype	IgG2a-κ
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

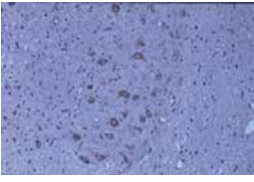
Reference on 5HT receptors:

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).

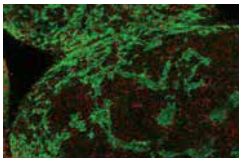
7. Neurodegenerative Disease

Neutralizing antibody for orphan ligand Apelin					
Wako Cat. No.	Product Name		Grade	Pkg. Size	Storage Condition
013-25871	Anti Apelin, Monoclonal Antibody (4G5)		for Immunochimistry	100 µL	Keep at 2-10°C.
Antibody information					
Antigen	Apelin		Application	ICC/ELISA/ Neutralization	Isotype
Antigen information	pGlu65-Apelin13 (QRPRLSHGKPMFP)		Species cross reactivity	Human, mouse, rat	Label
Antigen synonyms	APLN, APEL, XNPEP2, AGTRL1 Ligand		Host	Mouse	Clone No.
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.: <i>EMBO J.</i> 2008 Feb 6; 27 (3) : 522-34 2) <i>Biochim Biophys Acta.</i> 2001 Apr 23; 1538 (2-3) : 162-71.				

Autophagy related factor SQSTM1/A170/p62 antibody

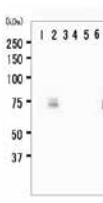
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition		
018-22141	Anti SQSTM1/A170/p62, Rabbit	for Immunocytochemistry	100 µL	Keep at -20°C.		
Antibody information						
Antigen	SQSTM1, A170, p62	Application	WB/IHC	Isotype	IgG	Image of immunostaining (Rat basal ganglion)  Data provided: Courtesy of K. Nakaso at Faculty of Medicine, Tottori University
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/proteasome 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.: <i>J. Biol. Chem.</i> , 275 , 16023 (2000).					

Glycoprotein tenascin-C antibody

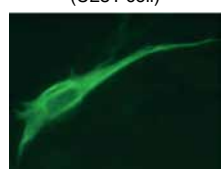
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition		
018-21781	Anti Human Tenascin-C, Rat Monoclonal Antibody	for Immunocytochemistry	100 µg	Keep at -80°C.		
Antibody information						
Antigen	Tenascin-C	Application	IHC	Isotype	IgG2a	Image of immunostaining (Tissue of human ovarian tumor transplanted on nude mouse)  Green: Tenascin-C Red: nucleus
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.: <i>J. Neurosci. Res.</i> , 47 , 109 (1997).					

8. Neurogenesis

Neuronal development, Maturation factor CRMP2 antibody

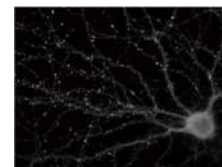
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition		
014-24821	Anti CRMP2, Monoclonal Antibody (9F)	for Immunocytochemistry	100 µL	Keep at 2-10°C.		
Antibody information						
Antigen	CRMP2	Application	WB/IHC/ICC/ELISA	Isotype	IgG	WB image  Lane1: CRMP1 overexpression HEK293T cell extract Lane2: 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
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.: <i>Mol Neurobiol.</i> , 72 (12), 1528 (2012).					

Astrocyte marker GFAP antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition		
012-27281	Anti GFAP, Monoclonal Antibody (MO389)	for immunocytochemistry	10 µL	Keep at -20°C.		
018-27283			50 µL			
Antibody information						
Antigen	GFAP	Application	WB, ICC	Isotype	IgG1	Immunostaining image (U251 cell) 
Antigen information	Synthetic peptide: CQIRETpSLDTKS	Species cross reactivity	Human	Label	Unlabeled	
Antigen synonyms	Glial fibrillary acidic protein	Host	Mouse	Clone No.	MO389	
Summary	Glial fibrillary acidic protein (GFAP) is a member of the intermediate filaments and the molecular weight is about 50kDa. GFAP is a useful marker of astrocytes. This item is a mouse monoclonal antibody which reacts with GFAP.					

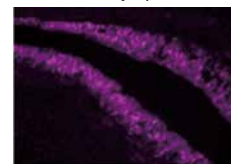
Synapse maturation related factor Drebrin antibody					
Wako Cat. No.	Product Name		Grade	Pkg. Size	Storage Condition
015-27271	Anti Drebrin, Monoclonal Antibody (M2F6)		for immunochemistry	10 µL	Keep at -20°C.
011-27273				50 µL	
Antibody information					
Antigen	Drebrin E	Application	WB, ICC, IHC	Isotype	IgG1·κ
Antigen information	Purified chicken Drebrin E	Species cross reactivity	Mouse, rat, human etc.	Label	Unlabeled
Antigen synonyms	-	Host	Mouse	Clone No.	M2F6
Summary	Drebrin is an F-actin binding protein which is involved in neuronal migration, neurite outgrowth, and synaptic formation in neural development. It is known that Drebrin has two isoforms in mammals, Drebrin E that is an embryonic form and Drebrin A that is an adult form. This item is a mouse monoclonal antibody that reacts with Drebrin A and Drebrin E.				
References	1) Shirao, T., et al. : <i>Brain Res.</i> , 29 , 233 (1986). 2) Shirao, T., et al.: <i>Neuroreport.</i> , 3 , 109 (1992).				

Immunostaining image
Primary cultured neuron derived from rat hippocampus (21DIV)



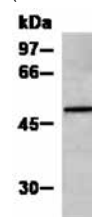
Neuronal progenitor cell marker Pax6 antibody					
Wako Cat. No.	Product Name		Grade	Pkg. Size	Storage Condition
019-27291	Anti Pax6, Rabbit		for immunochemistry	10 µL	Keep at -20°C.
015-27293				50 µL	
Antibody information					
Antigen	Pax6	Application	WB, IHC	Isotype	IgG
Antigen information	Synthetic peptide corresponding to 420-436 amino acid of mouse Pax6	Species cross reactivity	Mouse, rat, chicken	Label	Unlabeled
Antigen synonyms	AN2, Aniridia type II protein, Oculorhombin, Paired box gene 6	Host	Rabbit	Clone No.	(Polyclonal)
Summary	Pax6 is a member of the pax gene family that are transcription factors. Pax6 is involved in the proliferation, maintenance, and differentiation of neural stem cells. It is well known that Pax6 is a neural stem cell/progenitor cell marker. This item is a rabbit polyclonal antibody which reacts with Pax6.				

Immunostaining image
(Chicken olfactory epithelium at E7)



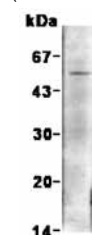
Phosphorylated GFAP antibody					
Wako Cat. No.	Product Name		Grade	Pkg. Size	Storage Condition
012-27301	Anti Human Phosphorylated GFAP S8, Monoclonal Antibody (YC10)		for immunochemistry	10 µL	Keep at -20°C.
018-27303				50 µL	
Antibody information					
Antigen	GFAP pS8	Application	WB, ICC	Isotype	IgG1
Antigen information	Synthetic peptide: RRRVTpSAARRS corresponding to GFAP (3-13 a.a.)	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	Glial fibrillary acidic protein	Host	Mouse	Clone No.	YC10
Summary	Glial fibrillary acidic protein (GFAP) is a member of intermediate filaments with a molecular weight about 50kDa. GFAP is a useful marker of astrocytes. This item is a mouse monoclonal antibody which reacts with GFAP and is phosphorylated at Ser-8.				

WB image
(U251 cell)

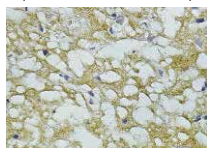


Phosphorylated GFAP antibody					
Wako Cat. No.	Product Name		Grade	Pkg. Size	Storage Condition
016-27321	Anti Human Phosphorylated GFAP S13, Monoclonal Antibody (KT13)		for immunochemistry	10 µL	Keep at -20°C.
012-27323				50 µL	
Antibody information					
Antigen	GFAP pS13	Application	WB, ICC	Isotype	IgG1
Antigen information	Synthetic peptide: CSAARRpSYVSSL	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	Glial fibrillary acidic protein	Host	Mouse	Clone No.	KT13
Summary	Glial fibrillary acidic protein (GFAP) is a member of intermediate filaments with a molecular weight about 50kDa. GFAP is a useful marker of astrocytes. This item is a mouse monoclonal antibody which reacts with GFAP and is phosphorylated at Ser-13.				

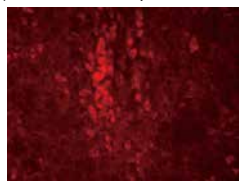
WB image
(U251 cell)



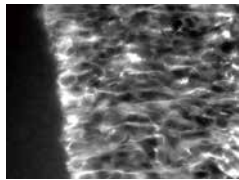
Synaptic vesicle marker Synaptophysin antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition		
013-27331	Anti Synaptophysin, Monoclonal Antibody (171B5)	for immunochemistry	10 µL	Keep at -20°C.		
019-27333			50 µL			
Antibody information						
Antigen	Synaptophysin	Application	WB, IHC	Isotype	IgG1	Immunostaining image (Human frontal lobe) 
Antigen information	Synaptic vesicle fraction from guinea pig cerebrum	Species cross reactivity	Mose, rat, human	Label	Unlabeled	
Antigen synonyms	Major synaptic vesicle protein p38	Host	Mouse	Clone No.	171B5	
Summary	Synaptophysin (SYP) is an integral membrane glycoprotein of about 38kDa which is a member of the SYP gene family. It is involved in synaptic vesicle formation. SYP is a known marker protein for neuroendocrine tumors. This item is a mouse monoclonal antibody which reacts with Synaptophysin.					

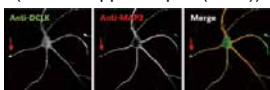
Serotonin Transporter antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition		
011-26911	Anti Mouse Serotonin Transporter, Rat Monoclonal Antibody (R5-3-2)	for immunochemistry	10 µL	Keep at -20°C.		
017-26913			50 µL			
Antibody information						
Antigen	Serotonin transporter	Application	IHC, FC	Isotype	IgG2a·κ	Immunostaining image (Mouse dorsal raphe nucleus)  <i>The data was provided by Takuma, K. and Hasebe, S., Osaka University in Japan.</i>
Antigen information	Mouse serotonin transporter	Species cross reactivity	Mouse	Label	Unlabeled	
Antigen synonyms	SERT, 5-HTT, SLC6A4, Solute Carrier Family 6	Host	Rat	Clone No.	R5-3-2	
Summary	Serotonin Transporter (SERT or 5-HTT or SLC6A4) is a membrane protein containing 12 transmembrane domains. The protein regulates the neuronal serotonin levels which affects sleep and anxiety. Serotonin Transporter is localized in various parts of the brain: raphe nuclei, cerebral cortex, and so on. This antibody reacts with the native form of the serotonin transporter.					

Neural stem cell-Neuronal progenitor cell marker Nestin antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition		
016-26841	Anti Mouse Nestin, Rat Monoclonal Antibody (7A3)	for immunochemistry	10 µL	Keep at -20°C.		
012-26843			50 µL			
Antibody information						
Antigen	Nestin	Application	ICC, IHC	Isotype	IgG2b·κ	Immunostaining image (Mouse cerebral cortex at E12.5) 
Antigen information	Mouse E16 embryonic cerebral cortex extracts	Species cross reactivity	Mouse	Label	Unlabeled	
Antigen synonyms	-	Host	Rat	Clone No.	7A3	
Summary	Nestin is an intermediate filament protein and belongs to a class VI intermediate filament. The protein is commonly known neural stem cells and neural progenitor cells marker in development of the central nervous system. This product is a mouse monoclonal antibody that reacts with Nestin.					

Dendritic growth and synapse maturation related factor-DCLK1 antibody

Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition		
019-27671	Anti Mouse DCLK1, Rabbit	for immunochemistry	10 µL	Keep at -20°C.		
015-27673			50 µL			
Antibody information						
Antigen	DCLK1	Application	WB, ICC, IHC	Isotype	IgG	Immunostaining image (Mouse Hippocampus (7DIV))  <i>The data was provided by Okabe, S. and Kashiwagi, Y. in Tokyo University in Japan</i>
Antigen information	Synthetic peptide (54-138 a.a. of mouse DCLK1)	Species cross reactivity	Mouse	Label	Unlabeled	
Antigen synonyms	-	Host	Rabbit	Clone No.	(Polyclonal)	
Summary	DCLK1 is a member of the protein kinase superfamily and the doublecortin family with molecular weight about 84 kDa. The protein is involved in several different cellular processes, including neuronal migration, neuronal apoptosis, neurogenesis, dendrite formation and synapse development. The item is rabbit polyclonal antibody reacting with mouse DCLK1 ¹⁾ .					
References	1) Shin, E., et al.: <i>Nature Communications.</i> , 4, 1440 (2013).					

Neuronal growth factor -NGF antibody-					
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
018-27141	Anti NGF, Monoclonal Antibody (NGFA-133)	for immunochemistry	10 µL	Keep at -20°C.	
014-27143			50 µL		
Antibody information					
Antigen	NGF	Application	Neu, ELISA	Isotype	IgG1
Antigen information	Human NGF	Species cross reactivity	Human, mouse, rat	Label	Unlabeled
Antigen synonyms	NGFB	Host	Mouse	Clone No.	NGFA-133
Summary	NGF is a protein, approximately 27kDa, acting as a growth factor in the nervous system. It regulates neuronal differentiation and growth by binding to TrkA and p75NTR. This product is an antibody which specifically recognizes NGF				
References	1) Okishio, M., Iwane, M., Igarashi, K. and Ichimori, Y. : <i>Biochem. Biophys. Res. Commun.</i> , 196 , 1474 (1993).				

Neuronal growth factor -NT-3 antibody-					
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
015-27151	Anti NT-3, Monoclonal Antibody (3W3)	for immunochemistry	10 µL	Keep at -20°C.	
011-27153			50 µL		
Antibody information					
Antigen	NT-3	Application	Neu, IHC, ELISA	Isotype	IgG1
Antigen information	Human NT-3	Species cross reactivity	Human, mouse, rat	Label	Unlabeled
Antigen synonyms	Neurotrophin-3, NTF3, NGF2	Host	Mouse	Clone No.	3W3
Summary	NT-3 (Neurotrophin-3/NTF3/NGF2/HDNF) is a protein, approximately 29kDa, acting as a growth factor in the nervous system. It regulates neuronal differentiation and growth by binding to TrkA, TrkB, TrkC and p75 NTR. This product is an antibody which specifically recognizes NT-3.				
References	1) Shintani, A., et al.: <i>Biochem. Biophys. Res. Commun.</i> , 194 , 3, 1500 (1993). 2) Katoh-Semba, R., et al.: <i>J. Neurochem.</i> , 66 , 1, 330 (1996). 3) Kaisho, Y., et al.: <i>Brain Res.</i> , 666 , 1, 143 (1994). 4) Humpel, C., et al.: <i>Science.</i> , 269 , 5223, 552 (1995). 5) Seki, M., et al.: <i>Jpn. J. Ophthalmol.</i> , 48 , 5, 460 (2004). 6) Murase, K., et al.: <i>Clin. Chim. Acta.</i> , 227 , 1, 23 (1994).				

Growth factor HB-EGF antibody					
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
013-27191	Anti HB-EGF, Monoclonal Antibody (Y-073)	for immunochemistry	10 µL	Keep at -20°C.	
019-27193			50 µL		
Antibody information					
Antigen	HB-EGF	Application	Neu, ELISA	Isotype	IgG1·κ
Antigen information	Human HB-EGF	Species cross reactivity	Human, mouse, rat	Label	Unlabeled
Antigen synonyms	Heparin Binding EGF Like Growth Factor, HEGFL, DTR	Host	Mouse	Clone No.	Y-073
Summary	HB-EGF is a heparin-binding growth factor belonging to the EGF family and is involved in cancer and arteriosclerosis. Dopaminergic neuroprotective action in the brain, neuroprotective action in the hippocampus, cerebral protective action in ischemia, etc. have been reported. HB-EGF knockout mouse has been reported to show schizophrenia-like behavior. This product is a mouse monoclonal antibody against HB-EGF.				
References	1) Sato, S., et al.: <i>PLoS One.</i> , 8 , 1, e54509 (2013).				

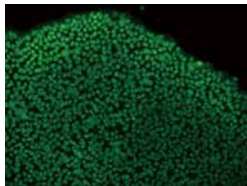
Growth factor HB-EGF antibody					
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
016-27181	Anti HB-EGF, Monoclonal Antibody (Y-20790080)	for immunochemistry	10 µL	Keep at -20°C.	
012-27183			50 µL		
Antibody information					
Antigen	HB-EGF	Application	Neu, ELISA	Isotype	IgG1·κ
Antigen information	Human HB-EGF	Species cross reactivity	Human, mouse, rat	Label	Unlabeled
Antigen synonyms	Heparin Binding EGF Like Growth Factor, HEGFL, DTR	Host	Mouse	Clone No.	Y-20790080
Summary	HB-EGF is a heparin-binding growth factor belonging to the EGF family and is involved in cancer and arteriosclerosis. Dopaminergic neuroprotective action in the brain, neuroprotective action in the hippocampus, cerebral protective action in ischemia, etc. have been reported. HB-EGF knockout mouse has been reported to show schizophrenia-like behavior. This product is a mouse monoclonal antibody against HB-EGF.				

Inflammation factor IL-6 Receptor α antibody					
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
012-27161	Anti Mouse soluble IL-6 Receptor α, Rat Monoclonal Antibody (IL6RNeuR4-7)	for immunochemistry	10 μ L	Keep at -20°C.	
018-27163			50 μ L		
Antibody information					
Antigen	IL-6 Receptor α	Application	Neu, ELISA	Isotype	IgG1 $\cdot\kappa$
Antigen information	MouseIL-6 Receptor α (20-357a.a.)	Species cross reactivity	Mouse	Label	Unlabeled
Antigen synonyms	CD126, Gp80	Host	Rat	Clone No.	IL6RNeuR4-7
Summary	IL-6 plays an important role in the immune response, inflammation, and homeostasis by binding to the IL-6 receptor α /CD126 and IL-6 receptor β (gp130) . IL-6 receptor α is classified as a membrane-bound IL-6 receptor α and soluble IL-6 receptor α . In the nerve field IL-6 signal is known to promote the formation of inflammation and glial scar after spinal cord injury and may be a therapeutic target in nerve regeneration. This product is an antibody that recognizes mouse soluble IL-6 receptor α .				


Receptor tyrosine kinase -ALK antibody-					
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
017-27231	Anti ALK, Monoclonal Antibody (ALT1-3A2)	for immunochemistry	10 μ L	Keep at -20°C.	
013-27233			50 μ L		
Antibody information					
Antigen	ALK	Application	WB, IHC, ELISA	Isotype	IgG
Antigen information	GST+1058-1620 a.a.of human ALK	Species cross reactivity	Human, mouse	Label	Unlabeled
Antigen synonyms	ALK Receptor Tyrosine Kinase, CD246	Host	Mouse	Clone No.	ALT1-3A2
Summary	ALK is a receptor tyrosine kinase belonging to the insulin receptor family and involvement in tumorigenesis has been reported. Mutations in patients with neuroblastoma have been reported, and ALK inhibitors are known to suppress neuroblastoma cell proliferation. This product is a mouse monoclonal antibody that recognizes ALK.				

Brain expression factor -TMEM132A antibody-					
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
016-27201	Anti Human TMEM132A, Monoclonal Antibody (427-2 40F7-1)	for immunochemistry	10 μ L	Keep at -20°C.	
012-27203			50 μ L		
Antibody information					
Antigen	TMEM132A	Application	FC, ELISA	Isotype	IgG1
Antigen information	Human extracellular domain of TMEM132A	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	Transmembrane Protein 132A, GBP	Host	Mouse	Clone No.	427-2 40F7-1
Summary	TMEM132A is a transmembrane protein of about 110kDa, expressed in the nervous system. It is regulated by several factors, including GRP78, Sar1, and intracellular calcium, in a post-transcriptional manner. This product is an antibody that recognizes human TMEM132A.				

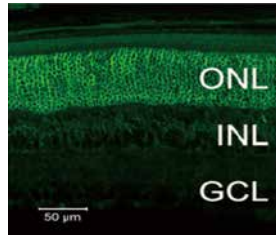
Brain expression factor -TMEM132A antibody-					
Wako Cat. No.	Product Name	Grade	Pkg. Size	Storage Condition	
013-27211	Anti Human TMEM132A, Monoclonal Antibody (427-2 18H11)	for immunochemistry	10 μ L	Keep at -20°C.	
019-27213			50 μ L		
Antibody information					
Antigen	TMEM132A	Application	FC, ELISA	Isotype	IgG1
Antigen information	Human extracellular domain of TMEM132A	Species cross reactivity	Human	Label	Unlabeled
Antigen synonyms	Transmembrane Protein 132A, GBP	Host	Mouse	Clone No.	427-2 18H11
Summary	TMEM132A is a transmembrane protein of about 110kDa, expressed in the nervous system. It is regulated by several factors, including GRP78, Sar1, and intracellular calcium, in a post-transcriptional manner. This product is an antibody that recognizes human TMEM132A.				

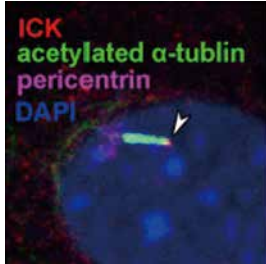
Neural stem cells marker						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
012-27541	Anti Sox2, Rabbit			for Immunocytochemistry	100 µL	Keep at -20°C.
Antibody information						
Antigen	Sox2	Application	WB, IHC	Isotype	IgG	Immunostaining image Human iPS cell: 201B7 
Antigen information	Mouse Sox2	Species cross reactivity	Human	Label	Unlabeled	
Antigen synonyms	-	Host	Rabbit	Clone No.	(Polyclonal)	
Summary	Sox 2 is one of the Sox genes associated with the sex determination gene SRY. It is expressed in embryonic inner cell mass and epiblast, extraembryonic mesoderm. Sox 2 is required during the undifferentiated state of pluripotent stem cells and is reported as one factor used to induce iPS cells from fibroblasts.					

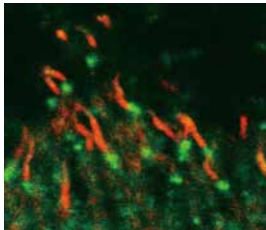
9. PKA Activation Marker

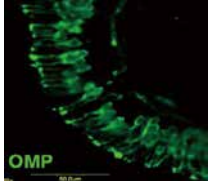
PKA kinase activity marker antibody						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
019-26451	Anti Phosphorylated Rap1gap S499, Monoclonal Antibody (8-8G-5A)			for Immunocytochemistry	100 µL	Keep at -20°C.
Antibody information						
Antigen	Rap1gap pS499	Application	WB	Isotype	IgG1·κ	WB image (mouse brain sample)  Lane1: Control Lane2: Sample added with Forskolin (a PKA activator)
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.					
References	Fujimura, M., et al.: <i>Toxicol. Lett.</i> , 271 , 66 (2017).					Data provided: Courtesy of Amano and Dr.Kaibuchi at Graduate School of Medicine, Nagoya University

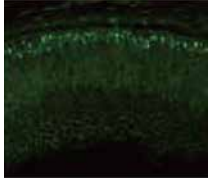
10. Sensory Organ

4.1G antibody						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
018-26421	Anti Mouse 4.1G/EPB41L2, Rabbit			for Immunocytochemistry	50 µL	Keep at -20°C.
Antibody information						
Antigen	4.1G EPB41L2	Application	WB/ICC	Isotype	IgG	Image of immunohistological stain  Green: 4.1G/EPB41L2 Data provided: Courtesy of Furukawa at Institute for Protein Research, Osaka University
Antigen information	Synthetic peptide TPRLRKRKGDPSNRGIC (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.: <i>Cell Reports</i> , 10 , 5, 796 (2015).					

ICK antibody						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
015-26431	Anti Mouse ICK, Guinea Pig			for Immunocytochemistry	50 µL	Keep at -20°C.
Antibody information						
Antigen	ICK	Application	WB/ICC	Isotype	IgG	Image of immunohistological stain 
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.: <i>The EMBO Journal</i> , 33 ,1227 (2014). <i>Data provided: Courtesy of Furukawa at Institute for Protein Research, Osaka University</i>					

Mak antibody						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
012-26441	Anti Mouse Mak, Guinea Pig			for Immunocytochemistry	50 µL	Keep at -20°C.
Antibody information						
Antigen	Mak	Application	WB/ICC	Isotype	IgG	Image of immunohistological stain 
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.: <i>Proc. Natl. Acad. Sci.</i> 107 , 22671 (2010). <i>Data provided: Courtesy of Furukawa at Institute for Protein Research, Osaka University</i>					

Matured olfactory nerve marker antibody						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
019-22291	Anti Olfactory Marker Protein, Goat			for Immunocytochemistry	100 µL	Keep at -20°C.
Antibody information						
Antigen	Olfactory Marker Protein (OMP)	Application	WB/IHC	Isotype	IgG	Image of immunohistological stain (olfactory epithelium of matured rat) 
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.: <i>J. Neurochem.</i> 90 , 102 (2004). <i>Data provided: Courtesy of Dr. Frank L. Margolis and Jae Hyung Koo, School of Medicine, University of Maryland</i>					

Retinal cone cell marker antibody						
Wako Cat. No.	Product Name			Grade	Pkg. Size	Storage Condition
016-24261	Anti Mouse Trβ2, Rabbit			for Immunocytochemistry	50 µg	Keep at -20°C.
Antibody information						
Antigen	Trβ2	Application	WB/IHC	Isotype	IgG	Image of immunostaining (mouse retina) 
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.: <i>Nature Neuroscience</i> , 14 ,1125-1134 (2011). <i>Data provided: Courtesy of T. Furukawa at No. 4 Laboratory, Osaka Bioscience Institute.</i>					

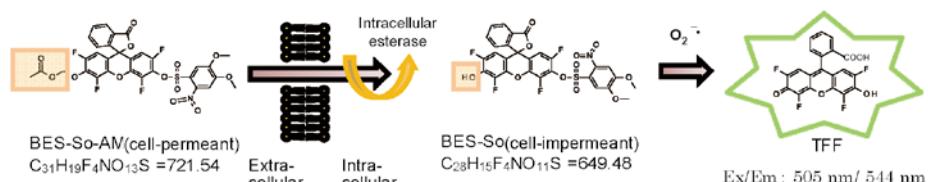
F. Fluorescent Probes

1. Superoxide-selective fluorescent probes

BES-So-AM / BES-So

Features

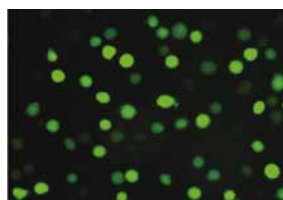
- Existing probes: Specificity much higher than hydroethidine
- Selectively reacts with superoxide / enables detection of superoxide production in live cells
- BES-So-AM is cell-permeant
- Highly water-soluble and can be prepared as an aqueous solution
- Applicable to flow cytometry



BES-So-AM: Application examples

Fluorescence imaging

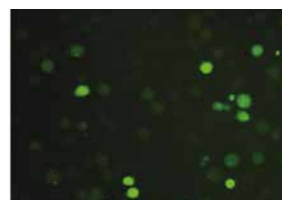
1) O₂^{•-} production stimulated



2) O₂^{•-} production unstimulated



3) O₂^{•-} production stimulated + O₂

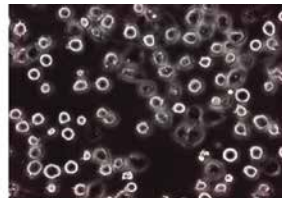
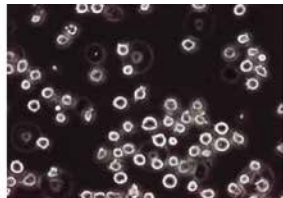
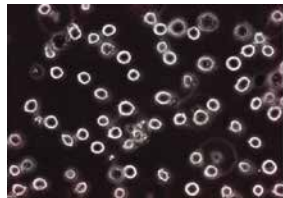


Images 1) and 2) were obtained by culturing Jurkat T cells in a medium containing 33 μM BES-So-AM at 37°C for 1 h to allow cellular uptake of the probe, followed by further culturing for 1 h after addition of 5 mM butyric acid [O₂^{•-} production stimulated] or without butyric acid addition [O₂^{•-} production unstimulated].

Image 3) was obtained by culturing Jurkat T cells in a medium containing 33 μM BES-So-AM and tiron (O₂^{•-} 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)

Phase contrast imaging



References

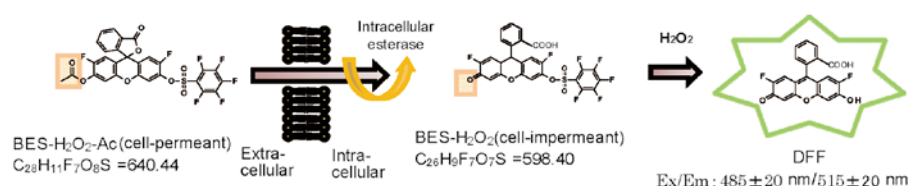
- 1) Maeda, H. *et al.*: *J. Am. Chem. Soc.*, **127**, 68 (2005).
- 2) Maeda, H. *et al.*: *Chem. Eur. J.*, **13**, 1946 (2007).

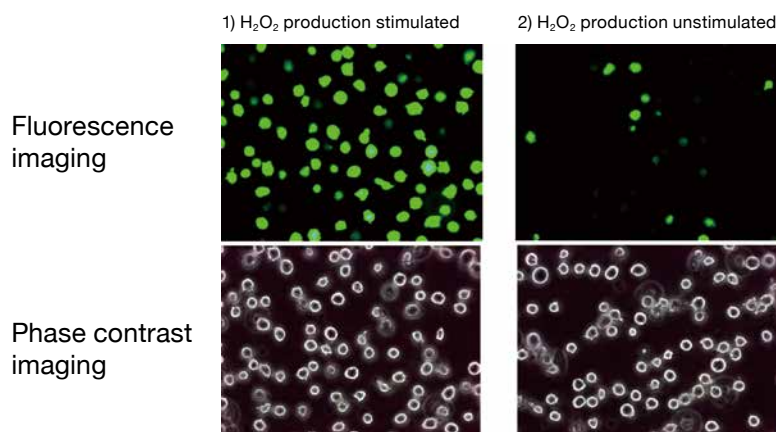
2. Hydrogen peroxide selective fluorescent probes

BES-H₂O₂-Ac / BES-H₂O₂

Features

- Existing probes: Specificity much higher than DCFH
- Enables detection of hydrogen peroxide production in live cells
- BES-H₂O₂-Ac is cell-permeant
- Highly water-soluble and can be prepared as an aqueous solution
- Applicable to flow cytometry



BES-H₂O₂-Ac: Application examples

Images 1) and 2) were obtained by culturing Jurkat T cells in a medium containing 50 mcM BES-H₂O₂-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 [H₂O₂ production stimulated] or without butyric acid addition [H₂O₂ production unstimulated].
(Data provided by Prof. Hatsuo Maeda, School of Pharmacy, Hyogo University of Health Sciences)

References

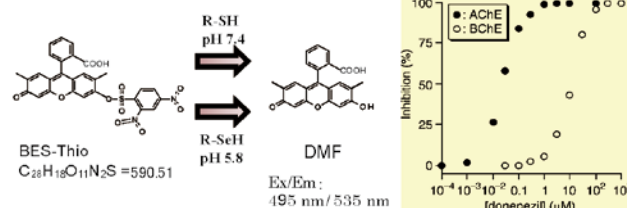
1) Maeda, H. *et al.*: *Angew. Chem. Int. Ed.*, **43**, 239 (2004). 2) Maeda, H. *et al.*: *Chem. Pharm. Bull.*, **49**, 294 (2001).

3. Thiol/selenol-selective fluorescent probes

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



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-H₂O₂-Ac	028-17811	1 mg		
BES-H₂O₂ (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.

G. Neural Cell Culture

1. Serum-free Culture Medium for Neural Cells

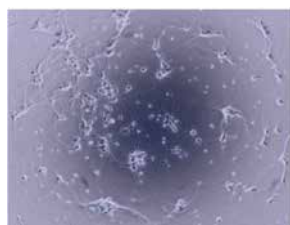
for cultivation of nerve cells/nerve stem cells NS Basal Medium / NS Supplement

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.

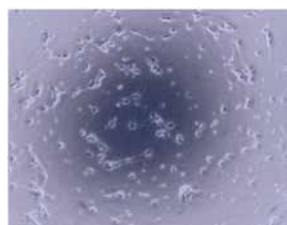
Cultivation of primary nerve cells derived from rat hippocampus

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

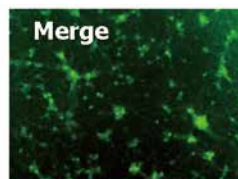
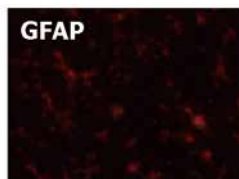
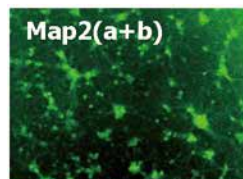


Competitor's basal medium/supplement

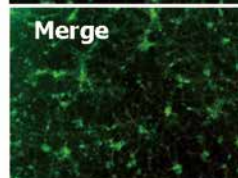
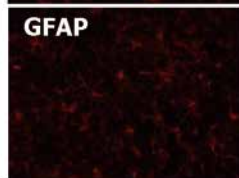
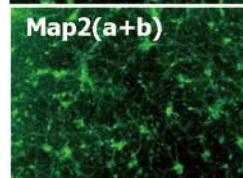
< Composition of medium >
NS Basal Medium + 2% NS Supplement
+ 0.5 mmol/L L-glutamine
< Number of cells inoculated >
13,000cells/well (96 well plate)

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 expression

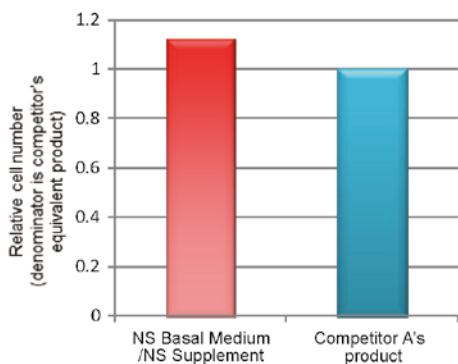
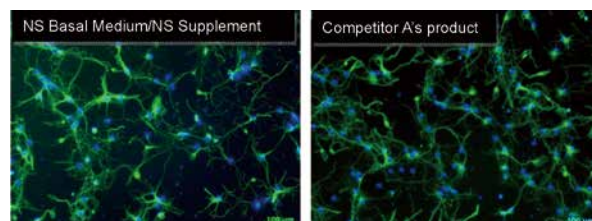


Fig.1. Comparison of cell count

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, β III-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 (x50)	146-09351	10 mL		Keep at -20°C.
NS Supplement (x50) without Vitamin A	142-09691	10 mL		

2. Neuron Culture Medium

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

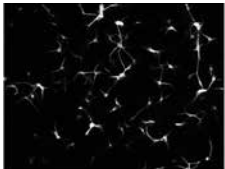
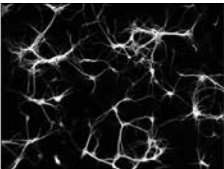
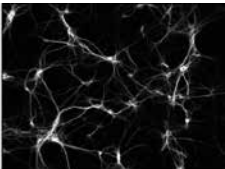
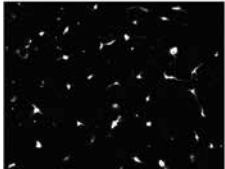

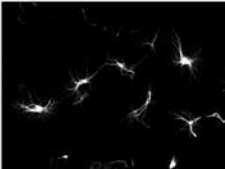
Neuron Culture Medium

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

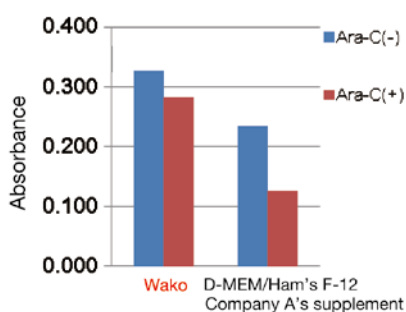
- Rapid neurite elongation
- Low density culture

Activity to maintain survival: Neurite elongation (MAP2 immunostaining)

	Day 3	Day 7	Day 14	
This product				Operating condition Cell count: 0.1×10^6 cell/mL (dispersed from total hippocampus day 18.5 mouse) Cultivation scale: 500 μ L/well (glass bottom dish) Procedure: Half of medium was replaced on Day 3 and Day 7
Competitor's medium + competitor's supplement				

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 μ L/well (48 well plate)
Procedure:
 Ara-C(-): Cultivated at 37°C under presence of CO₂ 5% for 5 days
 Ara-C(+): Cultivated at 37°C under presence of CO₂ 5% for 3 days. Subsequently, 200 mM Ara-C was added at amount of 10 μ L/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.

3. N2 Supplements for Neural Stem Cells

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 ferric ions added to the medium, which may be suitable for culturing of certain cells such as those prone to oxidative stress.

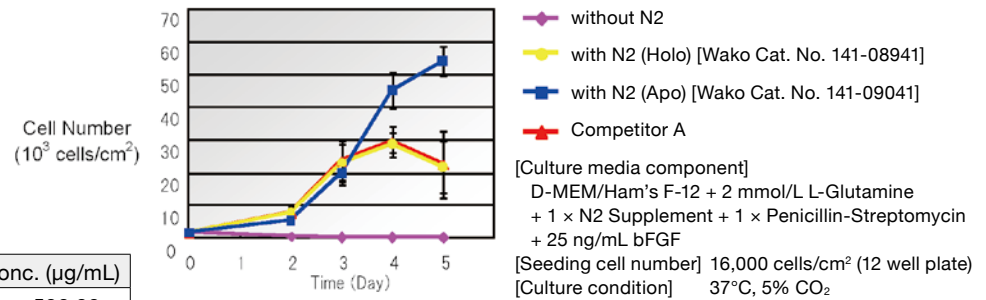
QC tests

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

Components

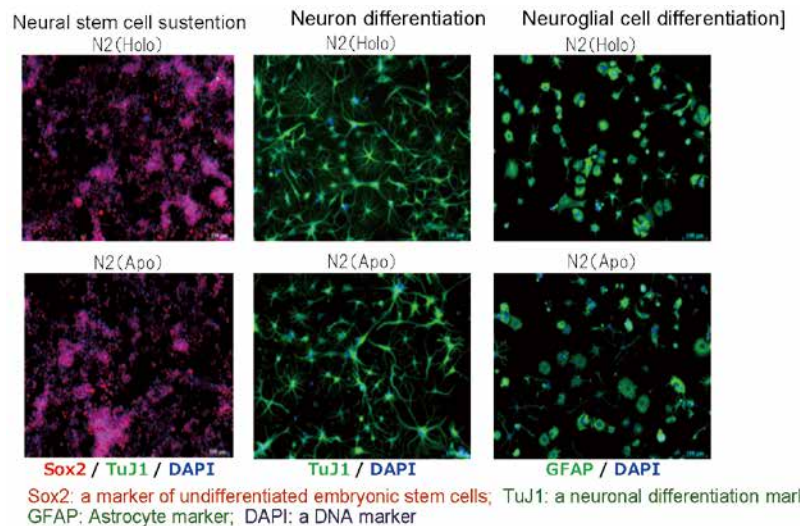
Component	Conc. (µg/mL)
Insulin, human, recombinant	500.00
Transferrin, human	10,000.00
Progesterone	0.63
Putrescine-2HCl	1,611.00
Sodium Selenite	0.52

Rat Hippocampus Neural Stem Cell Culture



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.



Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
N2 Supplement with Transferrin (Holo)(x100)	141-08941	5 mL	for Cell Culture	Keep at -20°C.
N2 Supplement with Transferrin (Apo)(x100)	141-09041	5 mL		

4. Neuron Dissociation Solutions

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

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		

H. Low-Molecule Compounds

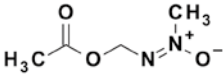
1. ALS

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

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

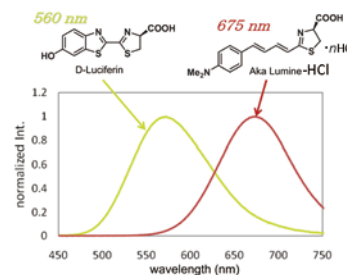
3. Schizophrenia Research

Wako Cat. No.	Product Name	Grade	Pkg. Size		
136-16303	Methylazoxymethanol Acetate [MAM]	for Cellbiology	20 mg		<p>CAS No. 592-62-1 C₄H₈N₂O₃ = 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.</p>

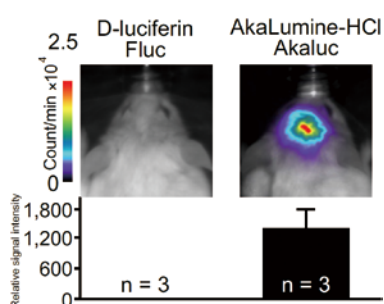
I. Near-Infrared Emission-Luciferin Analogue

for Deep Brain Imaging Aka Lumine-HCl

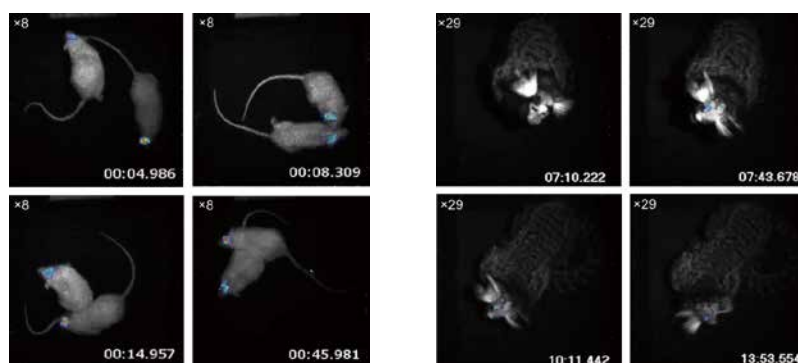
Aka Lumine HCL is a luciferin analogue has the luminescence peak at 670 ~ 680 nm. The peak range is in the near-infrared (NIR) window (also known as optical window). Since the adsorption of hemoglobin and water is small in the optical window, Aka Lumine is well suited to *in vivo* imaging. Dr. Iwano et al. developed AkaBLI that is a new bioluminescence *in vivo* imaging system. AkaBLI is expected to find out unprecedented scientific, medical, and industrial applications.



Bioluminescence images



Performance of Aka Lumine-HCl/Akaluc versus natural D-luciferin/Fluc for *in vivo* bioluminescence imaging. Mice were injected with 100 to 200 μ L of Aka Lumine-HCl (30mM).



Akaluc expression site: Striatum (Mouse Brain) Akaluc expression site: Striatum (Marmoset Brain)
Chronic video-rate AkaBLI of brain striatal neurons in a mouse and a marmoset

References

- 1) Iwano, S. *et al.* : *Tetrahedron.*, **69**, 3847 (2013).
- 2) Kuchimaru, T. *et al.* : *Nature Communications.*, **7**, 11856 (2016).
- 3) Iwano, S. *et al.* : *Science.*, **359**, 935 (2018).

Product Name	Wako Cat. No.	Package Size	Grade	Storage Condition
Aka Lumine-HCl	012-26701 018-26703	1 mg 10 mg	Biochemistry	Keep at -80°C.

Listed products are intended for laboratory research use only, and not to be used for drug, food or human use. / Please visit our online catalog to search for other products from Wako; <http://labchem-wako.fujifilm.com/> This leaflet may contain products that cannot be exported to your country due to regulations. / Bulk quote requests for some products are welcomed. Please contact us.

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