

Therapeutic Targets for Neurodegenerative Diseases



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Neurodegeneration is a neurological disorder with evolving atrophy and irreversible damage of neurons. Alzheimer's (AD) and Parkinson's (PD) are two of the most common neurodegenerative diseases. Neurotrophic factors (NTFs) control nerve cell proliferation and differentiation. The ability of these factors to promote cell survival and regeneration following injury, especially after stroke and brain injury, is applied in nerve cell culture and differentiation research. They are the first factors tested in the Central Nervous System (CNS) as therapeutic biologics.

GDNF, NGF, and BDNF are growth factors responsible for the survival, maintenance, and regeneration of specific neurons, rendering them as therapeutics for neurodegenerative diseases (Fig.1). Gradient concentrations of NTFs: NGF, NT-3, GDNF, and BDNF show the growth of neural cells in a temporospatial pattern. Clinical trials of GDNF (therapy for PD), NGF (therapeutic option for AD), and BDNF (therapeutic target for both AD and PD) are in progress.

In addition to classical NTFs, NT-4, CDNF, MANF, NT-5, PDGF, LIF, Midkine, and the NTF receptors (TrkA, TrkB, TrkC) are in preclinical and clinical studies, with promising results in clinical trials and a few approved drugs.

Therapies targeting neurotrophic factors and associated receptors can also be an effective approach for the less common neurodegenerative diseases such as Huntington's (HD), amyotrophic lateral sclerosis (ALS), and Rett Syndrome.

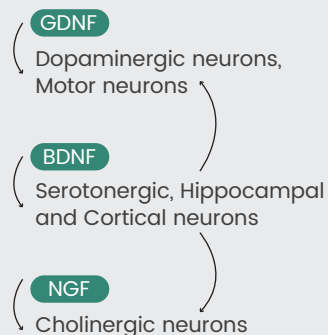


Fig1: Neuron Specificity

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GDNF & Receptor Complex



Glial cell line-derived neurotrophic factor (GDNF) plays a vital role in promoting motor neuron survival and axon outgrowth. It is being evaluated in clinical trials as a potential therapeutic for Parkinson's disease. GFL-like drugs are also being developed to treat disorders such as neuropathic pain and addiction.



GDNF belongs to the GDNF family of ligands (GFLs), which also consists of neurturin (NRTN), artemin (ARTN), and persephin (PSPN). These molecules bind to GFRA1, GFRA2, GFRA3, and GFRA4, respectively. GDNF/GFRA1 complex triggers the phosphorylation of RET tyrosine kinase receptor, ultimately eliciting cell survival, proliferation, and development via the MAPK/ERK or PI3K/Akt pathways. GDNF/GFRA1 also complexes with NCAM to induce axonal expansion. In addition, GDNF can synergize with other growth factors, including transforming growth factor- β (TGF- β).



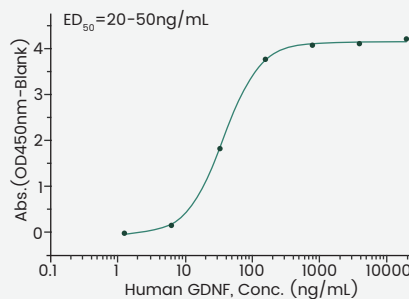
GDNF plays a significant role in the treatment of PD. GDNF binds to GFRA1 and Ret protein as a common signalling receptor shared with GDNF family ligands. Sino Biological has developed bioactive recombinant growth factors from various species, such as human, mouse, cynomolgus, rhesus, rat, and canine.

Recombinant GDNF and GFRA1 Proteins

Sino Biological has developed an array of recombinant GDNF and GFRA1 proteins and antibodies from various species, such as human, mouse, cynomolgus, rabbit, rat, and canine.

Human GDNF Protein

10561-HNCH



Binding ability by ELISA. Immobilized human GFRA1 (Cat: 10330-H02H) at 10 μ g/mL (100 μ L/well) can bind GDNF.

Rat GDNF Protein

80050-R07B

Purity: > 95%

Expressed Host: Insect Cell

Activity:

1. Bind rat GFRA1
2. Cell proliferation

Canine GDNF Protein

70255-D01H

Purity: > 90%

Expressed Host: HEK293 Cell

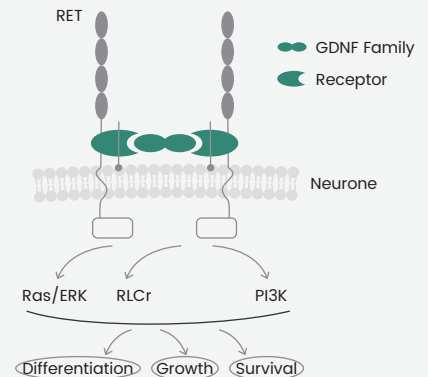
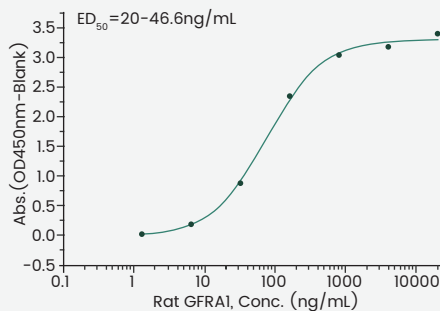


Fig.2: GDNF ligand dimer binds to two GFRA receptors and dimerises two RET receptors

Rat GFRA1 Protein

80021-R02H



Binding ability by ELISA. Immobilized rat GDNF (Cat: 80050-R07B) at 10 μ g/mL (100 μ L/well) can bind rat GFRA1.

More GFRA1 Proteins

Cat#	Species	Expressed Host	Tag	Purity	Activity
10330-H02H	Human	HEK293 Cells	hFc	>90%	Active
10330-H08H	Human	HEK293 Cells	His	>98%	Active
50171-M08H	Mouse	HEK293 Cells	His	>98%	Active
70062-D08H	Canine	HEK293 Cells	His	>95%	
80021-R02H	Rat	HEK293 Cells	hFc	>90%	Active
80021-R08H	Rat	HEK293 Cells	His	>97%	Active

Human RET Protein
11997-H08H1

Purity: > 92%
Expressed Host: HEK293 Cell

Human RET Protein
11997-H20B

Purity: > 90%
Expressed Host: HEK293 Cell

Other Related Proteins

ARTN

GFRA2

GFRA3

RET

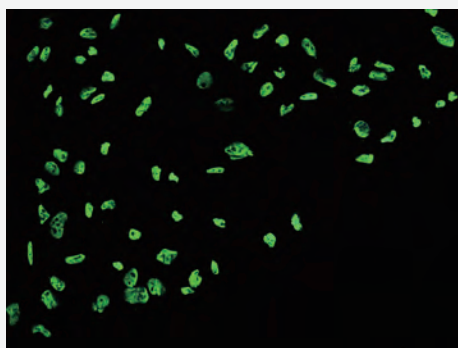
NCAM

TGF-beta

Antibodies for GDNF and GFRA1

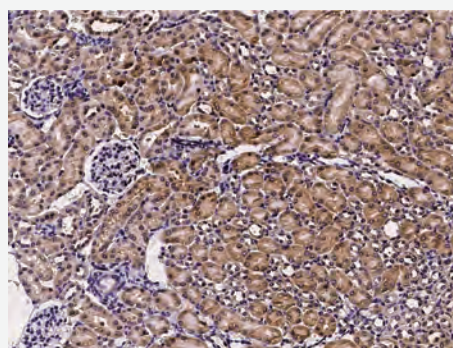
Sino Biological has developed a panel of antibodies targeting GDNF and GFRA1, which can be used in ELISA, WB, IF, and ICC.

Anti-GDNF Rabbit Polyclonal Antibody
(Cat#: 207160-T02)



Immunofluorescence Staining of GDNF in
U251MG Cells

Anti-GFRA1 Rabbit Monoclonal Antibody
(Cat#: 50171-R009)



Immunochemical Staining of Mouse GFRA1
in Mouse Kidney Cells

GDNF Superfamily & Receptors

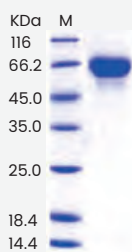
GDNF superfamily proteins (artemin/ARTN, neurturin/NRTN, and persephin/PSPN) show protective and restorative effects in the developing and adult central nervous system (CNS). GDNF, Neurturin, Artemin, and Persephin bind to GFRα1, GFRα2, GFRα3, and GFRα4, respectively.

Human Artemin Protein

50176-M01H

Purity: > 90%
Expressed Host:
HEK293 Cell

Human GFRα2 Protein



10331-H08H

Purity: > 98%
Expressed Host:
HEK293 Cell

Human GFRα3 Protein

10213-H08H

Purity: > 90%
Expressed Host:
HEK293 Cell

More Related

GFRα

RET

IL-6

IGF-1

EGF

CNTF

TGF-alpha

TGF-beta

VEGF

FGF

BMP

IL-2

IL-3

IL-5

PKC

Akt

MAPK

Neurotrophins and Receptors

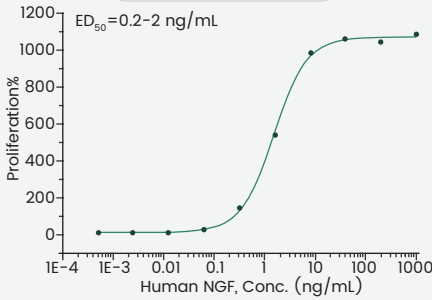
Neurotrophins are growth factors that are essential for neuron development, survival, and maintenance. There are four neurotrophin family members: NGF, BDNF, neurotrophin 3, and neurotrophin 4. They can bind to specific Trk receptors with high affinity and p75NTR with low affinity, respectively, to elicit neurotrophic or pro-apoptotic signaling. NGF binds to TrkA; BDNF and neurotrophin 4 bind to TrkB; neurotrophin 3 binds to TrkC. NGF, BDNF and all the receptors are targets for therapy in AD. BDNF is also a therapeutic option for PD.

NGF (Nerve Growth Factor)

NGF is the first discovered member of neurotrophin family. It is important in the survival, growth, and maintenance of specific types of neurons.

Human NGF Protein

11050-HNAC



Purity: > 95%
Expressed Host: CHO Stable Cells
Activity: Cell proliferation assay using TF-1 human erythroleukemic cells

BDNF (Brain Derived Neurotrophic Factor)

BDNF supports the survival and maintenance of sensory neurons, retinal ganglia, certain cholinergic neurons, spinal motor neurons, and some dopaminergic neurons.

Mouse BDNF Protein

50240-M08H



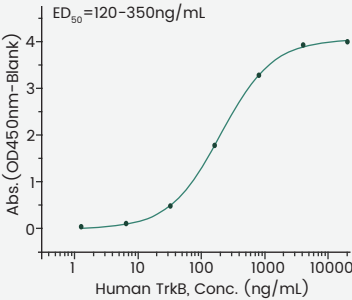
Purity: > 95%
Expressed Host: HEK293 Cells

Neurotrophin 3/NT3

Human NT3 Protein

10286-HNAE

Purity: > 90%
Expressed Host: *E. coli*
Activity: Binding ability in a functional ELISA, bind to human TrkB.



Neurotrophin 4/NT4

Human NT4 Protein

10265-HNAE

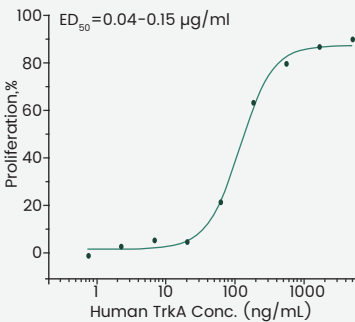
Purity: > 95%
Expressed Host: HEK293 Cells

Trk Receptors

Human TrkA Protein

11073-H03H

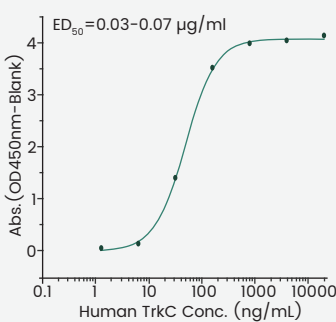
Purity: > 95%
Expressed Host: HEK293 Cells
Activity: Ability to inhibit NGF-induced proliferation of TF-1 human erythroleukemic cells



Human TrkC Protein

10048-H08H

Purity: > 95%
Expressed Host: HEK293 Cells
Activity: Immobilized human TrkC can bind biotinylated human NT3 (Cat#: 10286-HNAE)



List of Recombinant Trk Receptors

Cat#	Molecule	Species	Expressed Host	Purity	Tag	Activity
11073-H03H	TrkA	Human	HEK293 Cells	>98%	C-hFc & His	Active
11073-H07E1	TrkA	Human	<i>E. coli</i>	>97%	N-His	Active
51103-M02H	TrkA	Mouse	HEK293 Cells	>90%	C-hFc	Active
51103-M08H	TrkA	Mouse	HEK293 Cells	>95%	C-His	Active
70101-D01H	TrkA	Canine	HEK293 Cells	>90%	N-hFc	Active
70101-D07H	TrkA	Canine	HEK293 Cells	>95%	N-His	Active
80404-R02H	TrkA	Rat	HEK293 Cells	>95%	C-hFc	Active
80404-R08H	TrkA	Rat	HEK293 Cells	>95%	C-His	Active
10047-H02H	TrkB	Human	HEK293 Cells	>90%	C-hFc	Active
10047-H08H	TrkB	Human	HEK293 Cells	>97%	C-His	Active
50132-M08H	TrkB	Mouse	HEK293 Cells	>98%	C-His	Active
70035-D08H	TrkB	Canine	HEK293 Cells	>95%	C-His	Active
80243-R08H	TrkB	Rat	HEK293 Cells	>95%	C-His	Active
10048-H03H	TrkC	Human	HEK293 Cells	>98%	C-hFc & His	Active
10048-H08H	TrkC	Human	HEK293 Cells	>95%	C-His	Active
50320-M08H	TrkC	Mouse	HEK293 Cells	>95%	C-His	Active

Low Affinity Common Receptor to Neurotrophins: p75NTR

Human p75NTR Protein

13184-H08H

Purity: > 95%

Expressed Host: HEK293 Cell

Citation:

Cited by 26687096 (PubMed ID)

Mouse p75NTR Protein

50971-M02H

Purity: > 90%

Expressed Host: HEK293 Cell

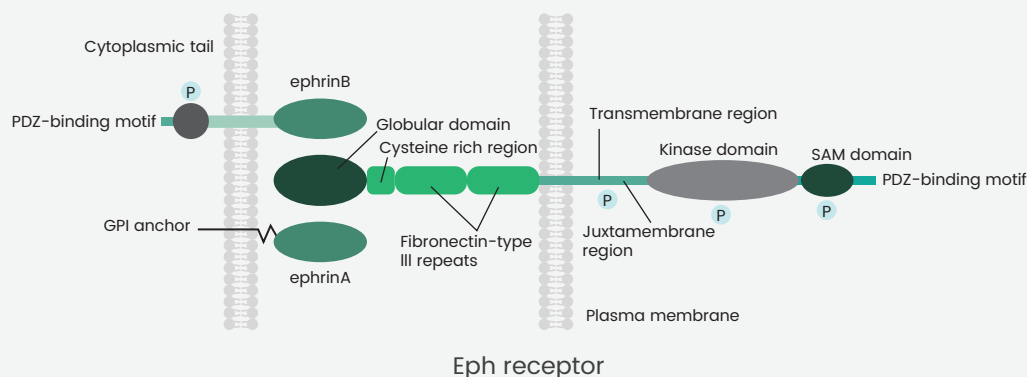
Activity:

Inhibit NGF-dependent proliferation of TF-1 human erythroleukemic cells. ED₅₀ is 0.5-3 µg/mL in the presence of 2 ng/mL Recombinant mouse NGF.

Ephrins and Eph Receptors

Ephrins and Eph receptors enable contact-mediated interactions between cells during the nervous system development. All the EphA receptors in mammals (EphA1-10) bind to all the ephrin-A molecules (ephrin A1-6). The EphB receptors (EphB1-6) bind to all ephrin-Bs (ephrin B1-3). Despite their broad binding affinities, Eph proteins facilitate specificity in neuronal migration and axon targeting. Because of their involvement in many pathological conditions ranging from neurological disorders to cancer and viral infections, ephrins and Eph receptors are recognized as attractive therapeutic targets. Various strategies are being developed to modulate their expression and function.

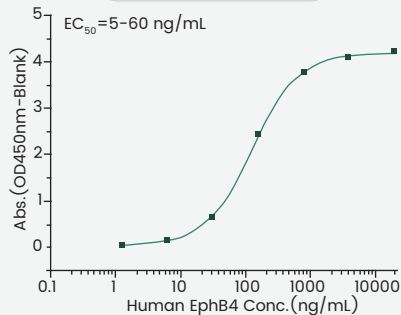
Sino Biological has developed an array of recombinant Ephrins and Eph receptors proteins and antibodies from various species.



Featured Recombinant Ephrins & Eph Receptors Proteins

Human Ephrin B2 Protein

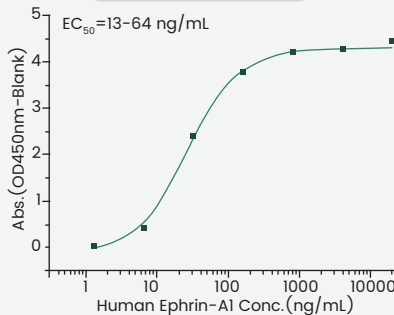
10881-HCCH



Immobilized human EFNB2 can bind human EphB4-Fc.

Human Ephrin A1 Protein

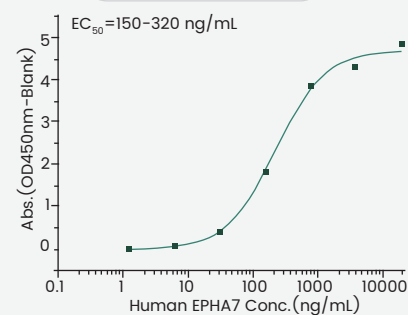
10882-H02H



Immobilized human Ephrin-A1 Protein can bind mouse EphA2 Protein.

Human Ephrin A4 Protein

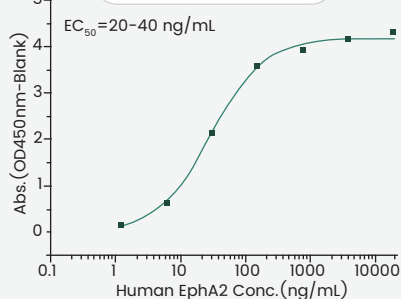
12087-H08H



Immobilized human EFNA4hcan bind human EPHA7-His/Biotin.

Human EphA2 Protein

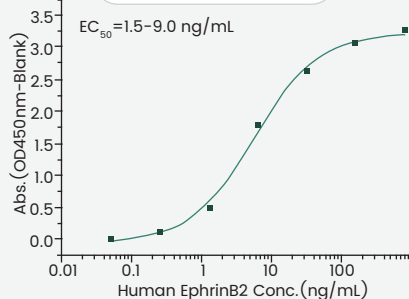
13926-H27H-B



Immobilized EFNA1-Fch
(Cat: 10882-H03H)
can bind Human EphA2.

Human EphB1 Protein

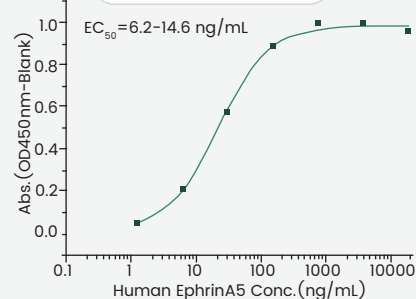
11963-H08H



Immobilized human EphB1 can bind
human Ephrin B2
(Cat: 10881-H03H).

Human EphA3 Protein

11459-H08H



Immobilized human EPHA3-His can
bind human EphrinA5-Fc
(Cat: 10192-H02H).

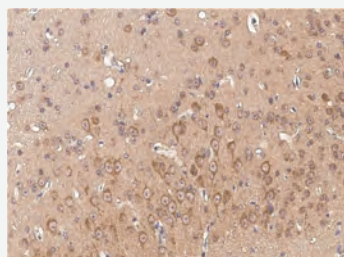
More Recombinant Ephrins & Eph Receptors Proteins (Partial)

Molecule	Cat#	Species	Expressed Host	Purity
Ephrin A1	10882-H02H	Human	HEK293 Cells	> 95 %
Ephrin A1	10882-H08H	Human	HEK293 Cells	> 97 %
Ephrin A1	50593-M02H	Mouse	HEK293 Cells	> 85 %
Ephrin A1	50593-M08H	Mouse	HEK293 Cells	> 97 %
Ephrin A1	80115-R08H	Rat	HEK293 Cells	> 95 %
Ephrin A2	50579-MCCH	Mouse	HEK293 Cells	> 97 %
Ephrin A3	10188-H02H	Human	HEK293 Cells	> 95 %
Ephrin A3	50594-M08H	Mouse	HEK293 Cells	> 92 %
Ephrin A4	12087-H02H	Human	HEK293 Cells	> 90 %
Ephrin A4	12087-H08H	Human	HEK293 Cells	> 95 %
Ephrin A5	10192-H02H	Human	HEK293 Cells	> 95 %
Ephrin A5	10192-H08H	Human	HEK293 Cells	> 90 %
Ephrin A5	50597-M08H	Mouse	HEK293 Cells	> 97 %
Ephrin B1	10894-H03H	Human	HEK293 Cells	> 95 %
Ephrin B1	10894-H08H	Human	HEK293 Cells	> 95 %
Ephrin B2	10881-H03H	Human	HEK293 Cells	> 97 %
Ephrin B2	10881-H08H	Human	HEK293 Cells	> 97 %
Ephrin B2	10881-HCCH	Human	HEK293 Cells	> 95 %
Ephrin B2	50598-M08H	Mouse	HEK293 Cells	> 95 %
EphA1	15789-H02H	Human	HEK293 Cells	> 90 %
EphA1	15789-H08H	Human	HEK293 Cells	> 95 %
EphA2	13926-H27H-B	Human	HEK293 Cells	> 95 %
EphA2	13926-H08H	Human	HEK293 Cells	> 95 %
EphA2	13926-H20B1	Human	Baculovirus-Insect Cells	> 95 %
EphA2	50586-M08H	Mouse	HEK293 Cells	≥ 95 %
EphA2	50586-MNAH	Mouse	HEK293 Cells	> 98 %
EphA3	11459-H08H	Human	HEK293 Cells	> 95 %
EphA3	51122-M08H	Mouse	HEK293 Cells	> 95 %
EphA4	11314-H03H	Human	HEK293 Cells	> 92 %
EphA4	11314-H08H	Human	HEK293 Cells	> 96 %
EphA4	50575-M08H	Mouse	HEK293 Cells	> 98 %
EphA7	11657-H08H	Human	HEK293 Cells	> 98 %
EphB1	11963-H08H	Human	HEK293 Cells	> 95 %
EphB2	10762-H03H	Human	HEK293 Cells	> 90 %
EphB2	10762-H08H	Human	HEK293 Cells	> 98 %
EphB2	51367-M02H	Mouse	HEK293 Cells	> 95 %
EphB4	10235-H02H	Human	HEK293 Cells	> 90 %
EphB4	10235-H08H	Human	HEK293 Cells	> 95 %
EphB4	10235-HCCH	Human	HEK293 Cells	> 95 %
EphB4	50582-M02H	Mouse	HEK293 Cells	> 97 %
EphB6	10197-H02H	Human	HEK293 Cells	> 90 %
EphB6	10197-H08H	Human	HEK293 Cells	> 92 %

Antibodies for Ephrins and Eph Receptors

Anti-Ephrin A5 Antibody Rabbit PAb

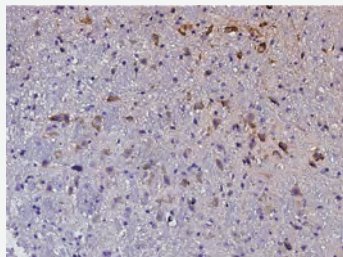
50597-T08



Immunochemical staining of mouse EFNA5 in mouse brain.

Anti-Ephrin A3 Antibody Rabbit PAb

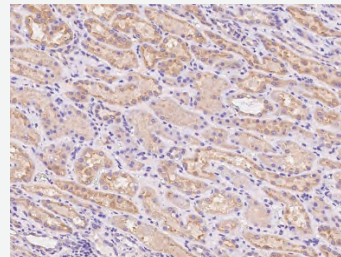
50594-T24



Immunochemical staining of mouse EFNA3 in mouse brain.

Anti-EphA4 Antibody Rabbit PAb

11314-T24



Immunochemical staining of human EPHA4 in human kidney.

More Antibodies for Ephrins and Eph Receptors (Partial)

Antigen	Cat#	Species	Clonality	Ig Type	Application
Ephrin A1	10882-R453	Human	Rabbit MAb	Rabbit IgG	IHC-P
Ephrin A1	10882-RP02	Human	Rabbit PAb	Rabbit IgG	ELISA, IHC-P
Ephrin A2	50579-RP01	Mouse	Rabbit PAb	Rabbit IgG	ELISA
Ephrin A3	10188-RP01	Human	Rabbit PAb	Rabbit IgG	ELISA
Ephrin A3	50594-T24	Mouse	Rabbit PAb	Rabbit IgG	ELISA, IHC-P
Ephrin A5	50597-T08	Mouse	Rabbit PAb	Rabbit IgG	IHC-P
Ephrin B1	10894-RP01	Human	Rabbit PAb	Rabbit IgG	ELISA
Ephrin B1	80106-T52	Rat	Rabbit PAb	Rabbit IgG	WB, ELISA, IP
Ephrin B2	10881-T16	Human	Rabbit PAb	Rabbit IgG	ELISA
Ephrin B2	50598-T24	Mouse	Rabbit PAb	Rabbit IgG	ELISA, IHC-P
EphA1	15789-T16	Human	Rabbit PAb	Rabbit IgG	ELISA
EphA2	50586-R301	Mouse	Rabbit MAb	Rabbit IgG	ELISA, FCM
EphA3	310438-T08	Human	Rabbit PAb	Rabbit IgG	IHC-P
EphA4	11314-T24	Human	Rabbit PAb	Rabbit IgG	ELISA, IHC-P
EphA7	310442-T32	Human	Rabbit PAb	Rabbit IgG	WB
EphB1	11963-R022	Human	Rabbit MAb	Rabbit IgG	ELISA
EphB2	100091-T08	Human	Rabbit PAb	Rabbit IgG	IHC-P
EphB2	10762-RP01	Human	Rabbit PAb	Rabbit IgG	ELISA
EphB4	10235-R001-A	Human	Rabbit MAb	Rabbit IgG	FCM
EphB4	310443-T08	Human	Rabbit PAb	Rabbit IgG	IHC-P
EphB4	10235-MM04	Human	Mouse MAb	Mouse IgG1	ELISA, FCM, ICC/IF
EphB6	10197-T24	Human	Rabbit PAb	Rabbit IgG	ELISA, IHC-P
EphB6	10197-R037	Human	Rabbit MAb	Rabbit IgG	ELISA

Neuroinflammation

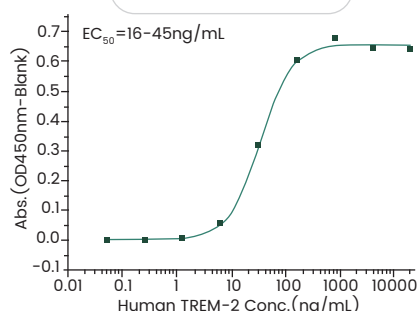
Neuroinflammation is defined as an inflammatory response within the brain or spinal cord. This inflammation is mediated by the production of cytokines, chemokines, reactive oxygen species, and secondary messengers. These mediators are produced by resident CNS glia (microglia and astrocytes), endothelial cells, and peripherally derived immune cells. Inflammatory processes contribute to neurological disorders, and many therapeutic breakthroughs in neurological disease have been immune-targeted. Neuroinflammation refers to the inflammation of the nervous tissue, and is an immune response often initiated against a variety of harmful stimuli such as pathogens or trauma.

Sino Biological provides high-quality bioreagents to support the research in neuroinflammatory, such as a comprehensive collection of cytokines.

Featured Products for Neuroinflammation

Human TREM-2 Protein

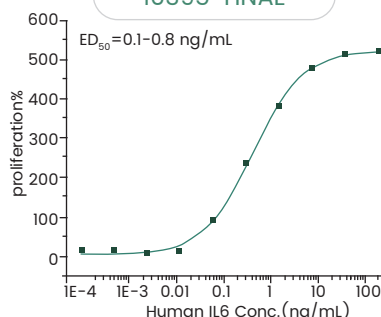
11084-H49H-B



Immobilized Anti-TREM-2 antibody (Cat: 11084-MM08) can bind Human TREM-2 Protein.

Human IL6 Protein

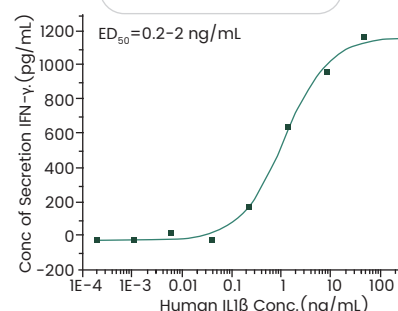
10395-HNAE



Cell proliferation assay using TF-1 human erythroleukemic cells.

Human IL1 β Protein

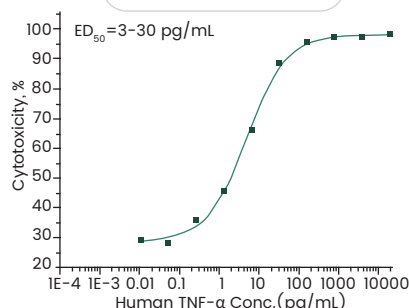
10139-HNAE



Ability to induce Interferon gamma secretion by human NK-92 cells.

Human TNF- α Protein

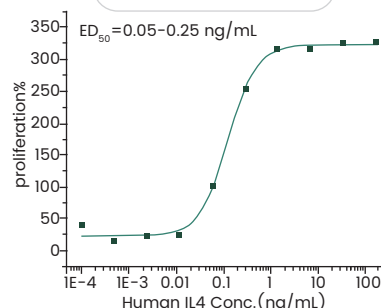
10602-HNAE



Cytotoxicity assay using L929 mouse fibrosarcoma cells.

Human IL4 Protein

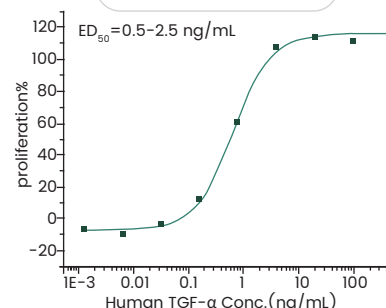
11846-HNAE



Cell proliferation assay using TF-1 human erythroleukemic cells.

Human TGF- α Protein

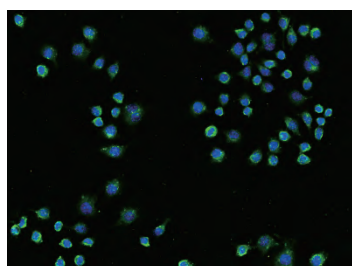
11252-HNAE



Cell proliferation assay using Balb/c 3T3 mouse embryonic fibroblast cells.

Anti-TREM-2 Antibody, Rabbit MAb

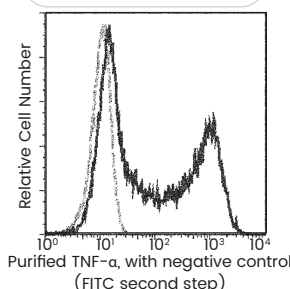
50149-R014



Immunofluorescence staining of mTREM2 in RAW264.7 cells.

Anti-TNF- α Antibody, Rabbit MAb

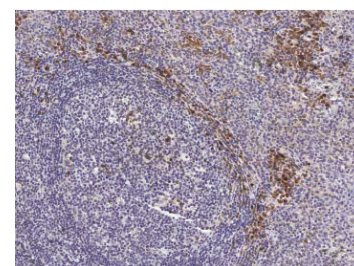
10602-R101



Flow cytometric analysis of Human TNF- α expression on human peripheral blood lymphocytes.

Anti-IL-6 Antibody, Rabbit PAb

90197-RP02



Immunochemical staining of rhesus IL6 in human tonsil.

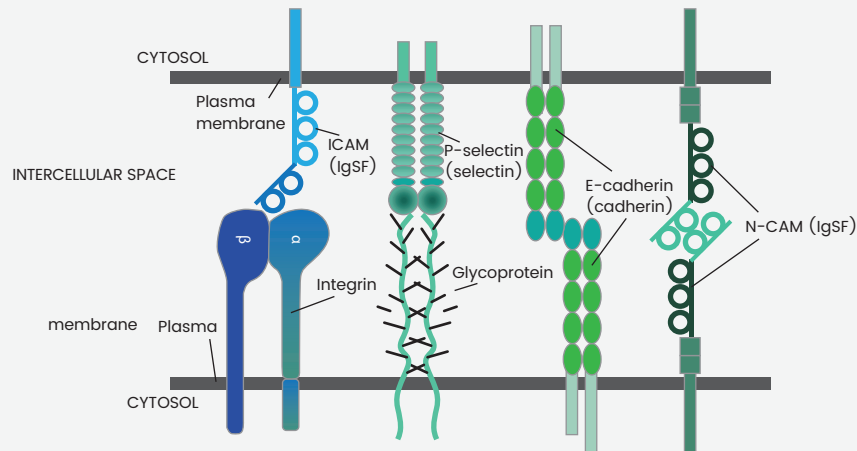
More Cytokines for Neuroinflammation (Partial)

Molecule	Human Protein	Anti-human Antibody
TNF α	10602-HNAE, 10602-HNAE-B	10602-MM01-F (FCM), 10602-MM01 (Neutralization), 10602-R211 (ELISA)
IL-1 α	10128-HNCE, 10128-HNCH	10128-MM74 (ELISA), 10128-T16 (ELISA)
IL-1 β	10139-H07E	10139-MM39 (IHC-P), 10139-M201 (ELISA, IHC-P), 10139-R101 (ELISA)
IL1R1	10126-H02H, 10126-H08H	10126-MM10 (ELISA), 10126-RP01 (ELISA)
IL1R2	10111-H02H, 10111-H08H	10111-MM04 (ELISA), 10111-R020 (ELISA)
IL1RA	10123-H01H, 10123-HNAE	10123-MM02 (FCM, ICC/IF), 10123-T24 (ELISA, IHC-P), 10123-MM12 (ELISA)
IL-2	11848-H08H, 11848-HNAE2	11848-MM03 (ELISA), 11848-MM03-A (FCM), 11848-MM03-P (FCM)
IL-2RA	10165-H02H, 10165-H08H	10165-MM17-C (FCM), 10165-R216 (FCM), 10165-T24 (ELISA, IHC-P)
IL-2RB	10696-H02H, 10696-H05H	
IL-2RG	10555-H02H, 10555-H08H	105167-T40 (WB, IHC-P), 10555-MM10 (ELISA), 10555-RP01 (ELISA)
IL-3	11858-HNAE, 11858-H08H	106308-T32 (WB), 11858-MM35-H (ELISA), 11858-T48 (WB, ELISA)
IL-4	11846-HNAE, 11846-HNAE-B	11846-M401 (WB), 11846-MM04-H (ELISA), 11846-T48 (WB, ELISA)
IL-6		10395-mhK23 (Neutralization), 10395-MM02 (ELISA), 10395-MM10 (IHC-P)
IL-6R	10398-H02H, 10398-H08H	10398-MM08 (Neutralization), 10398-MM01 (ELISA), 10398-R502 (FCM)
IL-7	11821-HNAE	11821-MM20 (ELISA), 11821-R022 (ELISA)
IL-10	10947-H07H, 10947-HNAE	10947-MM19 (ELISA), 10947-R001 (ELISA)
IL-10RA	10419-H08H	
IL-10RB	10945-H03H, 10945-H08H	10945-RP01 (ELISA), 10945-T48 (WB, ELISA)
IL-12	CT050-HNAH, CT011-H08H	
IL-12 p35	10021-H02H, 10021-H08H	10021-R006 (ELISA), 10021-RP01 (ELISA), 10021-RP02 (WB, ELISA, IHC-P)
IL-12B	10052-H02H, 10052-H08H	10052-MM01 (ELISA), 10052-MM11 (ELISA)
IL12RB1	11674-H08H	101340-T36 (WB, IP), 11674-MM05 (ELISA), 310291-T08 (IHC-P)
IL-15	10360-H07E, 10360-HNCE	10360-MM04 (ELISA), 10360-RP01 (ELISA)
TGF α	11252-HNAE	11252-R012 (ELISA), 11252-T16 (ELISA)
TGF β 1	10804-H08H	10804-R016 (ELISA)
VEGFA	10009-HNAB, 15692-HNAH, 10008-HNAH	10009-RP02 (ELISA, IHC-P), 10008-T26 (ELISA, IHC-P, ICC/IF), 10008-R064 (ELISA)
VEGFB	10544-H01H	
VEGFC	10542-H08H	10542-T16 (ELISA)
VEGFD	10557-H08H	10557-R106 (ELISA), 10557-T16 (ELISA)
FGF1	10013-HNAE	10013-RP03 (ELISA), 204233-T02 (ICC/IF), 204233-T08 (IHC-P)
FGF2	10014-HNAE	100087-R013 (IHC-P), 310855-T36 (WB, IP), 10014-R101 (ELISA)
FGF10	10573-HNAE	101637-T08 (IHC-P), 10573-R014 (ELISA)
FGFR1	10616-H08H, 16482-H02H	100621-T08 (IHC-P), 10616-T16 (ELISA)
FGFR2	16485-H02H	10824-MM07 (ELISA)
FGFR3	16044-H02H, 16486-H02H	16486-RP01 (ELISA), 100550-MM07 (IHC-P)
FGFR4	10538-H02H, 10538-H08H	10538-T16 (ELISA)
EGF	10605-H01H, 10605-HNAE	10605-R001 (Neutralization), 101619-T32 (WB), 10605-T16 (ELISA)
EGFR	10001-H20B2, 10001-H27H-B	10001-R021 (ELISA, ICC/IF), 10001-RE01-F (FCM), 10001-T24 (IHC-P)
TREM2	11084-H02H, 11084-H08H	11084-T16 (ELISA)

Cell Adhesion Molecules

Cell adhesion molecules (CAMs) mediate interactions between cells and the surroundings which are critical to processes controlling cell activation, survival, migration, and plasticity. Increasing evidence suggests that CAMs mediate mechanisms involved in various neurological diseases. Based on their molecular structures, CAMs are categorized into four major families: integrins, selectins, immunoglobulin (Ig)-like CAMs (Ig-CAMs), and cadherins.

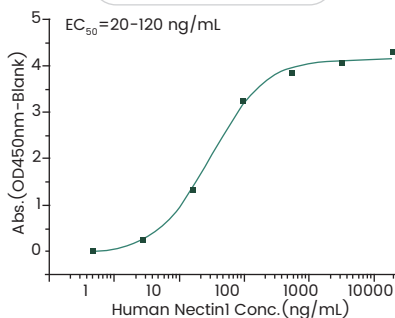
Sino Biological provides a comprehensive collection of proteins and antibodies to support the research in CAMs.



Featured Recombinant Nectins Proteins

Human Nectin1 Protein

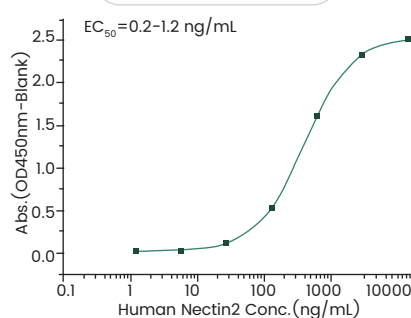
11611-H02H



Immobilized human Nectin 4 protein (Cat: 19771-H08H) can bind human Nectin1 protein.

Human Nectin2 Protein

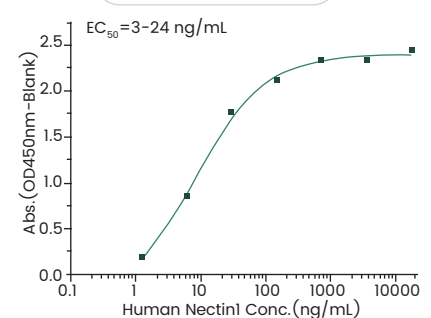
10005-H02H



Immobilized cynomolgus PVRIg protein (Cat: 90971-C08H) can bind human Nectin2 protein.

Human Nectin3 Protein

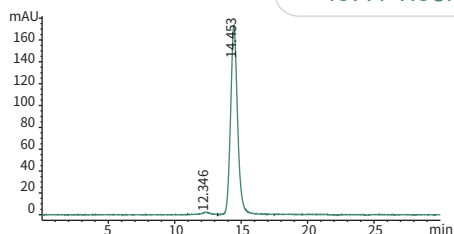
10852-H08H



Immobilized human Nectin3 can bind human PVRL1/NECTIN1 (Cat: 11611-H02H) protein.

Human Nectin4 Protein

19771-H08H



Purity

> 95 % as determined by SEC-HPLC.

Activity

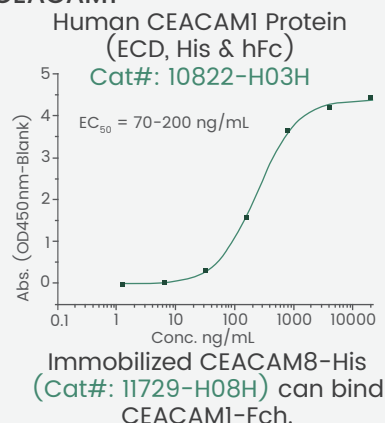
Immobilized human NECTIN4 can bind human PVRL1 (Cat: 11611-H08H), the EC_{50} is 200-800 ng/mL.

More Nectins Proteins (Partial)

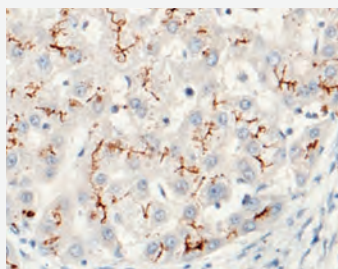
Cat #	Molecule	Species	Purity
11611-H08H	Nectin1	Human	> 98 %
58137-M02H	Nectin1	Mouse	> 95 %
80244-R02H	Nectin1	Rat	> 90 %
10005-H41H-B	Nectin2	Human	> 95 %
50318-M08H	Nectin2	Mouse	> 98 %
90206-C08H	Nectin2	Cynomolgus	> 90 %
10852-H02H	Nectin3	Human	> 95 %
19771-H02H	Nectin4	Human	> 95 %
5A7674-M02H	Nectin4	Mouse	> 95 %
90957-C02H	Nectin4	Cynomolgus	> 95 %

Other Adhesion Molecule Related Products

CEACAM1



Anti-CEACAM1 Antibody Cat#: 10822-MM02



Immunochemical Staining of
human CEACAM1 in human liver.

ITGA6

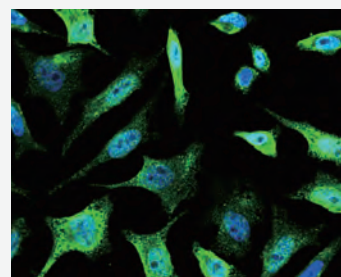
Human Integrin alpha 6 beta 1 Protein
Cat#: CT013-H2508H

Tag: Flag & His

Purity
> 92% as determined by
SDS-PAGE

Expressed Host
HEK293 Cells

Anti-ITGA6 Antibody Cat#: 100497-T10



Immunofluorescence staining
of ITGA6 in HeLa cells.

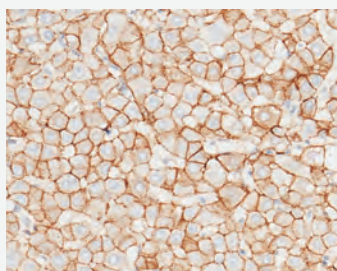
E-Cadherin

Human E-Cadherin Protein
(ECD, His Tag)
Cat#: 10204-H08H

Purity: > 90 % HEK293 Cells

Activity: Ability of the immobilized
protein to support the adhesion
of MCF-7 human breast
adenocarcinoma cells.

Anti-E-Cadherin Antibody Cat#: 10204-T58



Immunochemical staining of human
E-cadherin in human liver.

More Adhesion Molecule Related Products (Partial)

Molecule	Protein	Antibody	ELISA Kit
ASAM	H, M, R	H (ELISA, FCM), M (WB, ELISA)	
CD166/ALCAM	H, M, R, Cy	H (WB, ELISA, IHC-P, IF, FCM), M (ELISA, IHC-P, FCM), R (WB, ELISA, IHC-P, IP), Cy (WB, ELISA, IP, FCM)	
BCAM	H, M, R	H (WB, ELISA, IHC-P, IP), R (ELISA, IHC-P)	H
CD2	H, M, R, Cy, Ca	H (WB, ELISA, IHC-P, FCM), M (WB, ELISA, IHC-P)	
CD44	H, M	H (WB, ELISA, IHC-P, IF, FCM, IP), M (IHC-P)	H
CD48	H, M, R	H (WB, ELISA, IHC-P, FCM, IP), M (ELISA, FCM, IF), R (WB, ELISA, IHC-P, FCM, IP)	H, M
CEACAM1	H, M, R	H (WB, ELISA, IHC-P, IF, FCM), M (ELISA, IHC-P, IHC-Fr, IF, FCM), R (ELISA, IHC-P, FCM)	H
CEACAM5	H, Cy	H (ELISA, IHC-P, FCM)	H
CEACAM6	H, Cy	H (WB, ELISA, FCM, IHC-P, IF)	H
CHL1	H, M	H (ELISA), M (ELISA)	H
E-Cadherin	H, M, R	H (WB, ELISA, IHC-P, IF, FCM, IP), M (WB, ELISA, IHC-P, IP), R (WB, ELISA, IF)	H
ICAM-1	H, M, R, Rh	H (WB, ELISA, FCM, IHC-P, IF, IP), M (ELISA, IHC-P, IF, FCM), R (WB, ELISA, FCM, IHC-P, IF, IP)	H, M, R
JAM-A/Junctional Adhesion Molecule A	H, M, R	H (WB, ELISA, IHC-P, IF, FCM, IP)	H
LICAM	H	H (ELISA, IHC-P, FCM, IF), M (IHC-P)	H
CD146/MCAM	H, M	H (WB, ELISA, IHC-P, FCM, IF), M (WB, ELISA, IHC-P, FCM)	H
PVRL1/NECTIN1	H, R	H (WB, ELISA, FCM), R (ELISA)	H, R
Nectin-2	H, M, R, Cy	H (WB, ELISA, FCM, IP), M (WB, ELISA, IP), R (ELISA, IHC-P)	H
CD31	H, M	H (WB, ELISA, FCM, IHC-P, IF, IP), M (ELISA, FCM, IHC-P)	H
VCAM1	H, M	H (WB, ELISA, IHC-P, IF, FCM, IP), M (WB, ELISA, FCM)	H
VE-Cadherin	M, H, R	H (WB, ELISA, FCM, IHC-P, IF), M (WB, ELISA, IHC-P, FCM), R (WB, ELISA)	H

Neural Stem Cells

Neural Stem Cells (NSCs) are the most primordial and uncommitted cells of the nervous system and are believed to give rise to the vast array of more specialized cells of the CNS and peripheral nervous system (PNS). To be considered a "neural stem cell," in contrast to a "progenitor" cell (i.e., cells that have already become lineage committed to giving rise to only one category of neural component, e.g., glial cells versus neurons), that cell must be capable of (1) generating all neural lineages (neurons, astrocytes, and oligodendrocytes) throughout the nervous system, (2) having some capacity for self-renewal, and (3) being able to give rise to cell types in addition to themselves through asymmetric cell division.

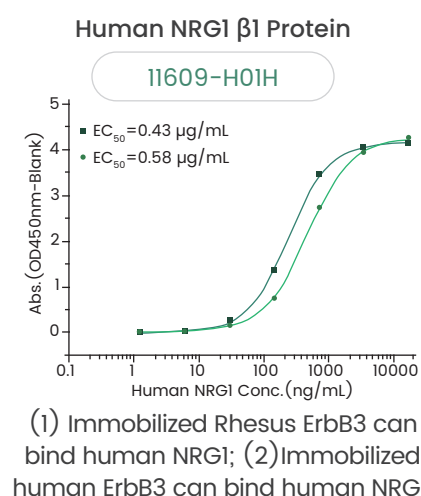
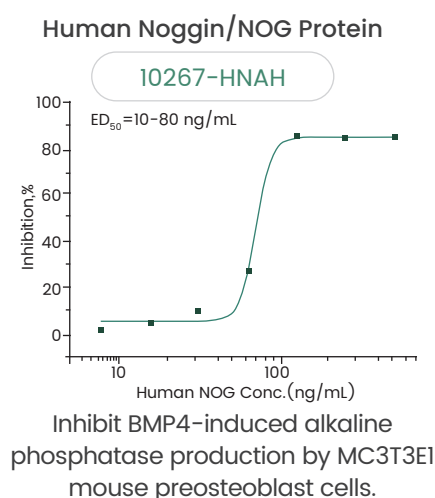
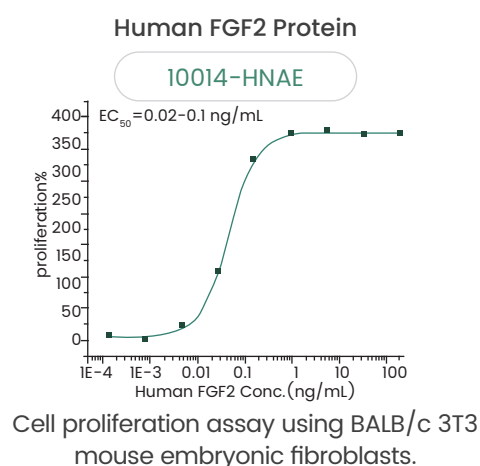
Sino Biological provides high-quality bioreagents to support the research in neural stem cells, such as a comprehensive collection of antibodies for differentiation markers and recombinant proteins for stem cell growth factors.

Table 1. Featured Molecules for Neural Stem Cells

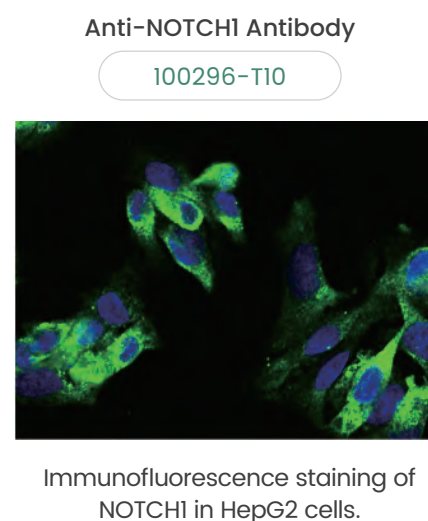
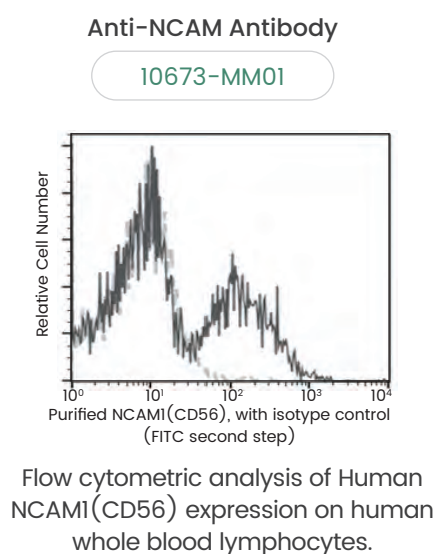
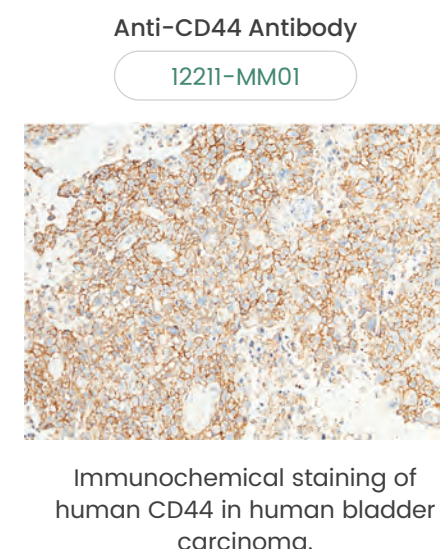
Category	Featured molecules
Differential markers	ApoE, CD44, NRG1, EPHB2, VIM, SNCA, NCAM, NFASC
Growth factors	BMP4, EGF, FGF2, VEGFA, TGF- β 1, TNFA, INHBA
Stem Cell Markers	CXCR4, NOG, NOTCH1, CDCP1
Transcription Factors	ATF2, KLF4, MSX1, nkx6.1, Olig2

Featured Products for Neural Stem Cells

Featured Proteins



Featured Antibodies



More Products for Neural Stem Cells (Partial)

Molecule	Protein	Antibody
ApoE	10817-H30E, 10817-H30E-B	10817-RP02 (ELISA, IHC-P)
CD44	12211-H02H, 12211-HNAH, 53953-M08H	12211-T62 (WB, ELISA, IHC-P, ICC/IF, IP), 12211-MM02 (FCM, ICC/IF)
NRG1	11609-H01H2, 13499-H08H, 70084-DCCH	13499-R005 (ELISA), 13499-T48 (WB, ELISA)
EphB2	10762-H03H, 51367-M02H	100091-T08 (IHC-P), 10762-RP01 (ELISA)
Vimentin	10028-H08B	100254-R001 (WB, IHC-P), 100254-T08 (IHC-P)
NCAM	10673-H08H, 80399-R08H	108577-T08 (IHC-P), 10673-T54 (WB, ELISA, ICC/IF, IP)
Neurofascin	15694-H02H-B, 15694-H08H	15694-MM02-P (FCM), 15694-T16 (ELISA)
BMP4	50439-M15H	10609-MM02 (FCM, ICC/IF)
FGF2	10014-HNAE, 50037-M07E	100087-R013 (IHC-P), 310855-T36 (WB, IP), 10014-R101 (ELISA)
VEGFA	10009-HNAB, 15692-HNAH, 10008-HNAH	10009-RP02 (ELISA, IHC-P), 10008-T26 (ELISA, IHC-P, ICC/IF), 10008-R064 (ELISA)
TNF α	10602-HNAE, 50349-MNAE, 80045-RNAE	10602-RP02 (WB, ELISA, IP), 10602-R101 (FCM)
TGF β 1	10804-H08H, 50698-M08H, 80116-RNAH	10804-R016 (ELISA), 70087-T52 (WB, ELISA, IP)
Activin A	10429-HNAH, 50659-M08H	50659-R105 (ELISA), 200422-T34 (WB, ICC/IF)
CXCR4/ CD184	11325-HNAH	310268-T36 (WB, IP)
Noggin/NOG	10267-H02H, 10267-H08H, 50688-M02H	100339-T36 (WB, IP)
NOTCH1	10954-H02H, 50654-M08B	100296-T10 (IHC-P, ICC/IF), 50654-T16 (ELISA)
CDCP1	13262-H05H, 51110-M02H, 90296-C08H	203663-T40 (WB, IHC-P), 51110-RP02 (ELISA, IHC-P)
ATF2	11599-H20B	11599-T56 (WB, ELISA, IHC-P), 100842-T02 (ICC/IF)
KLF4		100418-T36 (WB, IP)
MSX1		100723-T40 (WB, IP)
Olig2		101944-T42 (WB, ICC/IF, IHC-P), 100137-R064 (WB, IHC-P)

**Sino Biological US Inc. (U.S.A.)**

Address: 1400 Liberty Ridge Drive, Suite 101,
Wayne, PA 19087
Tel: +1-215-583-7898 Fax: +1-267-657-0217
Email: order_us@sinobiologicalus.com

Sino Biological Europe GmbH (Europe)

Düsseldorfer Str. 40, 65760 Eschborn, Germany
Tel: +49(0)6196 9678656
Fax: +49(0)6196 9678657
Email: order_eu@sinobiological.eu

株式会社日本シノバイオロジカル (Japan)

〒213-0012神奈川県川崎市高津区坂戸3-2-1 KSP西棟2階Tech-Pot
ホームページ: jp.sinobiological.com
お問い合わせ: info@sinobiological.co.jp
ご注文: order@sinobiological.co.jp
受託サービス: cro-service@sinobiological.co.jp
電話番号: 044-400-1330

Sino Biological, Inc. (Global)

Address: Building 9, No.18 Kechuang 10th St, BDA
Beijing, 100176, P.R.China
Tel: +86-400-890-9989
Fax: +86-10-5095-3282
Email: order@sinobiological.com

www.sinobiological.com



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