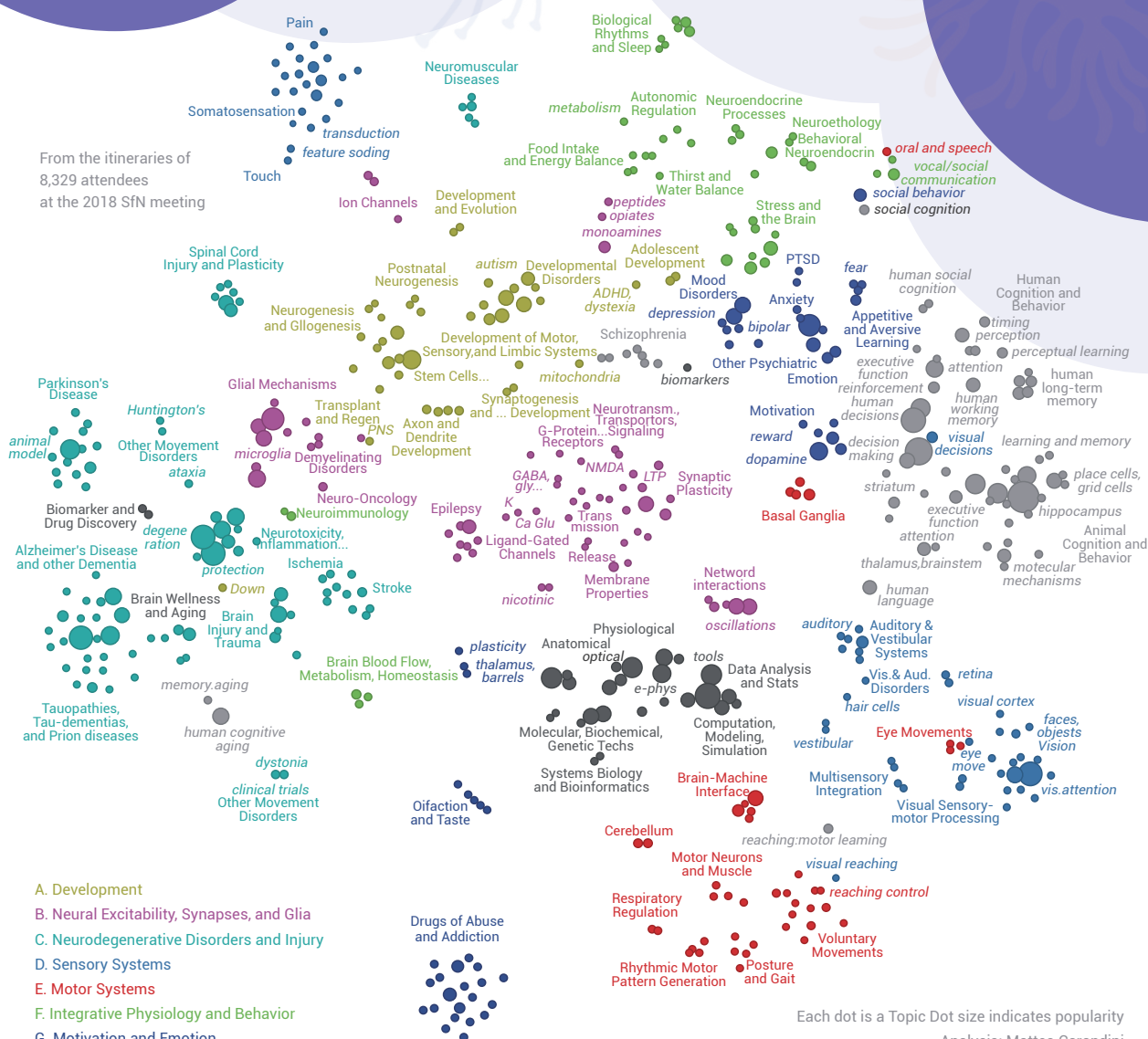


# Neuroscience Product Handbook



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Analysis: Matteo Carandini

Date: Society for Neuroscience

Reference: Carandini, M., Charting the Structure of Neuroscience. Neuron, 2019. 102(4): p. 732-734.

# Neuroscience

## Introduction

Neuroscience is the most fascinating discipline that attempts to understand the nervous system and to develop potential therapies. There are so many branches of neuroscience, among which development, neural signaling, neurodegenerative disorders, sensory/motor system, integrative neuroscience, motivation and emotion, cognition and techniques are mentioned with high frequencies.

In this handbook, neurotransmitters and their receptors, neuronal stem cells, neurodegenerative diseases, blood-brain barrier will be discussed.

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# Neurotransmitters and Neurotransmitter Receptors

Neurotransmitters are the small molecules of chemical substances that carry information between neurons. There are several types of neurotransmitters according to chemical properties, including monoamines and acetylcholine, amino acids, purines, lipids and peptides.

Neurotransmitters induce postsynaptic electrical potentials and biochemical changes through their receptors. The most familiar neurotransmitter receptors are ligand-gated channels and G protein-coupled receptors (GPCRs) (Figure 1). When a ligand (neurotransmitter) binds to the extracellular domain, the ligand-gated channels will open a central pore that permits ions to pass while GPCRs will transmit the signal to activate G proteins and then amplify the signaling cascades through second messengers.

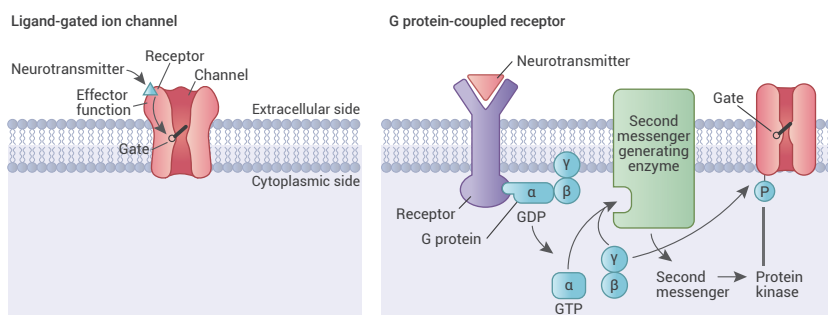


Figure 1. Neurotransmitter receptors <sup>[1]</sup>



For the central role of neurotransmitters, neurotransmitter receptors are critical targets for the treatment of nervous system related diseases such as psychiatric and neurologic disorders.

Compounds		
Cat. No.	Product Name	Description
HY-B0282	<b>Acetylcholine chloride</b>	A common neurotransmitter found in the central and peripheral nerve system.
HY-106094	<b>CY 208-243</b>	A selective dopamine D1 receptor agonist which exhibits anti-parkinsonian activity.
HY-B1473	<b>5-HT hydrochloride</b>	A monoamine neurotransmitter in the CNS and an endogenous 5-HT receptor agonist.
HY-B1204	<b>Histamine</b>	An organic nitrogenous compound involved in local immune responses and acts as a neurotransmitter.
HY-N0067	<b>GABA</b>	A major inhibitory neurotransmitter in the adult mammalian brain, binds to GABA receptors.
HY-14608A	<b>Monosodium glutamate</b>	Acts as an excitatory transmitter and an agonist at all subtypes of glutamate receptors.
HY-P0288	<b>Leu5-enkephalin</b>	A pentapeptide with morphine like properties. Acts as an agonist at opioid receptors.
HY-P1866	<b>β-Endorphin</b>	An endogenous opioid peptide that binds to both $\mu/\delta$ opioid receptors. Analgesic properties.
HY-P0201	<b>Substance P</b>	A neuropeptide, acting as a neurotransmitter and as a neuromodulator in the CNS.
HY-P1480	<b>Neuropeptide Y</b>	A neuropeptide Y receptor agonist.
HY-P1339	<b>Human orexin B</b>	An endogenous agonist of orexin receptor.
HY-P0049	<b>Vasopressin</b>	An endogenous hormone binds to the V1, V2, V3-vascular arginine vasopressin receptor.
HY-17571	<b>Oxytocin</b>	A mammalian neurohypophysial hormone.
HY-P0015	<b>Somatostatin</b>	A tetradecapeptide which can control growth hormone and pituitary hormone secretion in CNS.
HY-P0234	<b>Neurotensin</b>	A gut tridecapeptide that possesses high-affinity neurotensin receptors (NTR).

Cat. No.	Product Name	Description
HY-P0195	<b>Bombesin</b>	A tetradecapeptide that plays an important role in the release of gastrin and the activation of G-protein receptors.
HY-P1765	<b>Galanin</b>	A widely distributed neuropeptide with diverse biological effects.
HY-B0495	<b>Lamotrigine</b>	An anti-convulsant that inhibits voltage-sensitive sodium channels.
HY-13716	<b>Noscapine</b>	An orally active phthalideisoquinoline alkaloid that possesses neuroprotective activity, and can cross the blood-brain barrier.
HY-12987	<b>Pimozide</b>	A dopamine receptor antagonist.
HY-15399	<b>Vigabatrin</b>	An inhibitory neurotransmitter GABA vinyl-derivative, is an orally active and irreversible GABA transaminase inhibitor.
HY-12152	<b>PNU-120596</b>	A selective $\alpha 7$ nAChR positive allosteric modulator for psychiatric and neurological disorders research.
HY-14418	<b>VU0361737</b>	A CNS penetrant positive allosteric modulator of metabotropic glutamate receptor 4 (mGluR4 PAM). Neuroprotective effect.
HY-B0527A	<b>Amitriptyline</b>	An inhibitor of serotonin reuptake transporter and noradrenaline reuptake transporter. Antidepressant activity.
HY-15430A	<b>Encenicline</b>	A partial agonist of $\alpha 7$ neuronal nicotinic acetylcholine receptors (nAChRs).
HY-15608	<b>MPTP</b>	A brain penetrant dopamine neurotoxin, inducing Parkinson's Disease.
HY-136390	<b>ML417</b>	A selective and brain penetrant D3 dopamine receptor (D3R) agonist and exhibits neuroprotection.
HY-19918A	<b>Anatabine</b>	A tobacco alkaloid that can cross the blood-brain barrier. A potent $\alpha 4\beta 2$ nAChR agonist for neurodegenerative disorders treatment.

### Compound Screening Libraries

Cat. No. : HY-L062	Cat. No. : HY-L006
<b>Neurotransmitter Receptor Compound Library</b> A unique collection of compounds targeting a variety of neurotransmitter receptors.	<b>GPCR/G Protein Compound Library</b> A unique collection of compounds targeting GPCRs for various GPCRs-related research and drug development projects.

## Peptides

Cat. No.	Product Name	Description
HY-P0252	<b><math>\alpha</math>-MSH</b>	$\alpha$ -MSH is a neuropeptide and an endogenous melanocortin receptor 4 agonist.
HY-P1240	<b>Myelin Oligodendrocyte Glycoprotein Peptide (35-55), mouse, rat</b>	Myelin Oligodendrocyte Glycoprotein Peptide (35-55) is a minor component of CNS myelin.

## Recombinant Proteins

Cat. No.	Product Name	Description
HY-P71449	<b>Neuropeptide B, Human</b>	NPB is a multifaceted regulator that potentially influences various physiological processes, such as feeding, the neuroendocrine system, memory, learning, and pain pathways.
HY-P71063	<b>NPY, Human</b>	Neuropeptide Y plays a crucial role in complex neural circuits controlling appetite and energy balance.
HY-P71058	<b>PDYN, Human</b>	PDYN regulates Leu-enkephalins, mimicking opiate drug effects and impacting pain perception and stress responses.
HY-P71349	<b>Tachykinin-3, Human</b>	Tachykinin-3 induces neuronal excitation, behavioral responses, potent vasodilation, and secretion stimulation.
HY-P7707	<b>Calcitonin/CALCA, Human</b>	Calcitonin is peptide hormone.
HY-P7706	<b>CALCB, Human</b>	CALCB is a neuropeptide that plays a crucial role in inducing vasodilation.
HY-P74132	<b>Galanin, Human</b>	Galanin acts as an endocrine hormone in both the central and peripheral nervous systems.
HY-P78703	<b>Gastrin-71, Mouse</b>	Gastrin-71 serves as a potent stimulator of various physiological processes.
HY-P71727	<b>Chromogranin A, Human</b>	Chromogranin A is the major member of the granin family of acidic secretory glycoproteins expressed in all endocrine and neuroendocrine cells.

Cat. No.	Product Name	Description
HY-P71447	<b>GABRB2, Human</b>	GABRB2 is an important component of heteropentameric GABA receptors, which form ligand-gated chloride channels.
HY-P72140	<b>CHRNA1, Human</b>	CHRNA1 undergoes significant conformational changes upon acetylcholine binding, affecting all subunits and leading to ion channel activation.
HY-P72138	<b>CHRM1, Rat</b>	CHRM1 mediates cellular responses, including adenylate cyclase inhibition, phosphoinositide breakdown, and potassium channel modulation.
HY-P72144	<b>CHRNA3, Human</b>	CHRNA3, a critical contributor to collagen fibrillogenesis, regulates the rate of fibril formation and influences the assembly and organization of collagen fibrils.
HY-P74358	<b>Calcitonin R, Human</b>	Calcitonin R is a receptor for calcitonin and utilizes G proteins to activate adenyl cyclase.
HY-P71666	<b>GUCY2C, Rat</b>	GUCY2C, a guanylyl cyclase, crucially catalyzes cGMP synthesis from GTP.

### Neurotransmitter Associated Enzymes

Cat. No.	Product Name	Description
HY-P72859	<b>Butyrylcholinesterase, Mouse</b>	Butyrylcholinesterase, an esterase with broad substrate specificity, crucially inactivates acetylcholine, thus maintaining neurotransmitter homeostasis.
HY-P72149	<b>COMT, Human</b>	COMT plays a crucial role by catalyzing and inactivating the O-methylation of catecholamine neurotransmitters and catechol hormones.
HY-P76874	<b>Dopamine beta-Hydroxylase, Human</b>	DBH is an essential enzyme involved in the regulation of neurotransmitters.
HY-P74204	<b>DOPA Decarboxylase, Mouse</b>	DOPA Decarboxylase plays a key role in neurotransmitter synthesis by catalyzing the decarboxylation of L-DOPA to produce dopamine and L-5-HTP to produce serotonin.
HY-P73566	<b>Tryptophan hydroxylase 1, Human</b>	TPH-1 is key to serotonin biosynthesis, catalyzing the rate-limiting step: the oxidation of L-tryptophan to 5-hydroxy-L-tryptophan.

# Neural Stem Cells

Neural stem cells (NSCs) have the ability to self-renew and to differentiate into three neural lineages (i.e. neurons, oligodendrocytes and astrocytes). So, NSCs are promising therapeutics for diseases associated with the nervous system.

Except for direct isolation from primary tissues, NSCs can also be obtained by differentiation from pluripotent stem cells and transdifferentiation from somatic cells. Nowadays, small molecules are reported to gain their roles in transdifferentiating somatic cells into NSCs and some of them are listed as followed.

However, it is also important to maintain the balance between the proliferation and differentiation of NSCs as aberrant NSC proliferation can lead to tumorigenesis.

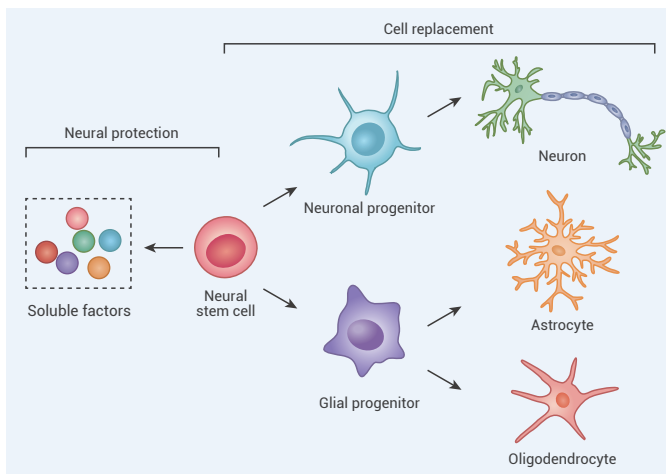


Figure 2. Functions of NSCs [2]

## Compounds

Cat. No.	Product Name	Description
HY-15036	<b>Diclofenac</b>	Acts as a COX inhibitor and induces apoptosis of neural stem cells (NSCs).
HY-12323	<b>Isoxazole 9</b>	A potent inducer of adult neural stem cell differentiation.
HY-10585	<b>Valproic acid (VPA)</b>	A potent HDAC inhibitor for the treatment of epilepsy, bipolar disorder and prevention of migraine headaches.
HY-10182	<b>CHIR99021</b>	A potent and selective GSK-3 $\alpha/\beta$ inhibitor, enhances mouse and human embryonic stem cells self-renewal.
HY-13012	<b>Repsox</b>	A potent and selective of the TGF $\beta$ R-1/ALK5 inhibitor. RepSox can replace Sox2.
HY-10432	<b>A83-01</b>	A potent inhibitor of TGF- $\beta$ type I receptor ALK5 kinase, type I nodal receptor ALK4 and type I nodal receptor ALK7.
HY-10587	<b>BIX-01294</b>	An inhibitor of G9a histone methyltransferase.
HY-13642	<b>RG108</b>	A non-nucleoside DNA methyltransferases inhibitor.
HY-B0166	<b>Vitamin C</b>	An electron donor and an endogenous antioxidant agent.
HY-10254	<b>PD0325901</b>	An orally active, selective and MEK inhibitor.

Cat. No.	Product Name	Description
HY-14649	<b>Retinoic acid</b>	A natural agonist of RAR nuclear receptors. Plays important roles in cell growth, differentiation, and organogenesis.
HY-12071	<b>LDN193189</b>	A selective BMP type I receptor inhibitor.
HY-124899	<b>Hh-Ag 1.5</b>	A potent Hedgehog agonist that breaks the quiescence of non-injured liver stem cells for rescuing liver failure.
HY-B1496	<b>Tranlycypromine hemisulfate</b>	An irreversible MAO inhibitor for the treatment of depression.
HY-100200	<b>SMER28</b>	A positive regulator of autophagy in an mTOR-independent manner. Prevents the accumulation of A $\beta$ peptide.
HY-13257	<b>Thiazovivin</b>	A ROCK inhibitor that protects human embryonic stem cells. Improves the efficiency of iPSC generation.
HY-15108	<b>Purmorphamine</b>	A smoothened (Smo) receptor agonist that stimulates osteogenic differentiation in murine and human cells.
HY-10591	<b>Neuropathiazol</b>	Induces neuronal differentiation of multipotent hippocampal neural progenitor cells.
HY-103361	<b>SB297006</b>	A CCR3 antagonist that significantly inhibits proliferation and neurosphere formation in CCL11-treated neural progenitor cells.
HY-108439	<b>Neurodazine</b>	A promoter of neurogenesis in pluripotent cells. Promotes neurogenesis by activating Wnt and Shh signaling pathways.
HY-W019870	<b>Glufosinate</b>	A phosphinic acid analogue of glutamic acid, which exerts neurotoxic activity.
HY-N6953	<b>Garcinone D</b>	A natural xanthone that promotes the proliferation of C17.2 neural stem cell.
HY-10046	<b>Plerixafor</b>	A selective CXCR4 antagonist. A hematopoietic stem cell (HSC) mobilizer.
HY-15838	<b>ID-8</b>	A DYRK inhibitor that sustains embryonic stem cell (ESC) self-renewal and pluripotency.
HY-10936	<b>S 18986</b>	A selective, orally active, brain penetrant AMPA positive allosteric modulator that enhances cognitive properties.
HY-108628	<b>SU16f</b>	A selective PDGFR $\beta$ inhibitor that blocks the promoting role of GC-MSCs in gastric cancer cell proliferation and migration.
HY-N0204	<b>Pulchrenoside A</b>	A natural triterpenoid saponin. AMPAR and NMDAR modulator.



## Compound Screening Library

Cat. No. : HY-L039

## Reprogramming Compound Library

A unique collection of compounds that act on reprogramming signaling pathways.

## Chemical Cocktails

HY-10585  
VPAHY-10182  
CHIR99021HY-13012  
RepSoxA combination of small molecules that induces reprogramming of mouse fibroblasts and human urinary cells into neural progenitor cell<sup>[3]</sup>.HY-10585  
VPAHY-10182  
CHIR99021HY-10432  
A 83-01HY-10587  
BIX-01294HY-13642  
RG108HY-B0166  
Vitamin CHY-10254  
PD0325901A combination of small molecules that induces reprogramming of mouse fibroblasts into neural stem cell<sup>[4]</sup>.HY-10182  
CHIR99021HY-10432  
A 83-01HY-124899  
Hh-Ag1.5HY-100200  
SMER28HY-12071  
LDN193189HY-B1496  
TranylcypromineHY-13642  
RG108A combination of small molecules that induces reprogramming of mouse fibroblasts into neural stem cell-like cells (ciNSLCs)<sup>[5]</sup>.HY-10432  
A 83-01HY-13257  
ThiazovivinHY-15108  
PurmorphamineHY-10585  
VPAA combination of small molecules that induces reprogramming of mouse fibroblasts into neural stem cell<sup>[6]</sup>.HY-10585  
VPAHY-10182  
CHIR99021HY-12071  
LDN193189HY-10431  
SB431542HY-15682  
TTNPBHY-13257  
ThiazovivinHY-13027  
DAPTHY-12848  
SAGHY-15108  
PurmorphamineA combination of small molecules can reprogram human astrocytes into fully functional neurons<sup>[7]</sup>.

## Recombinant Proteins

Cat. No.	Product Name	Description
HY-P70311	<b>Activin A, Human/Mouse/Rat</b>	Activin promotes cortical interneuron identity and differentiation in ESC-derived telencephalic neural precursors.
HY-P7067	<b>EGF, Mouse</b>	EGF is commonly used to promote the proliferation and differentiation of NSCs <i>in vitro</i> .
HY-P7004	<b>FGF basic/bFGF, Human</b>	bFGF is commonly used to promote the proliferation and differentiation of NSCs <i>in vitro</i> .
HY-P7006	<b>BMP-2, Human/Mouse/Rat</b>	BMPs, crucial morphogens, play a pivotal role in nervous system development.
HY-P70453	<b>Wnt3a, Human</b>	WNT signaling modulates the balance of NSCs proliferation and differentiation during neurogenesis.
HY-P70467	<b>SHH, Human</b>	The Sonic hedgehog pathway influences neurogenesis and neural patterning during central nervous system development.

## Neurodegenerative Diseases

Neurodegenerative diseases are a series of diseases caused by tremendous neuronal dysfunction and death including Parkinson's Disease (PD), Alzheimer's Disease (AD), Huntington's Disease (HD), Amyotrophic Lateral Sclerosis (ALS), and Prion Diseases, etc. It is reported that oxidative stress, environmental factors, aging and protein dysfunction are the major risk factors for neurodegeneration.

Protein misfolding, accumulation and aggregation are common characteristics in many neurodegenerative diseases. Protein aggregates formed by proteins such as  $\alpha$ -synuclein, tau, and  $\beta$ -amyloid (A $\beta$ ) peptides will trigger unfolded protein response (UPR), ER stress, and autophagy

of neurons. The dysfunction of mitochondrial may lead to the induction of apoptosis. What's more, the reports about the function of non-neuronal cells (glia) and neuroinflammation in neurodegeneration are growing.

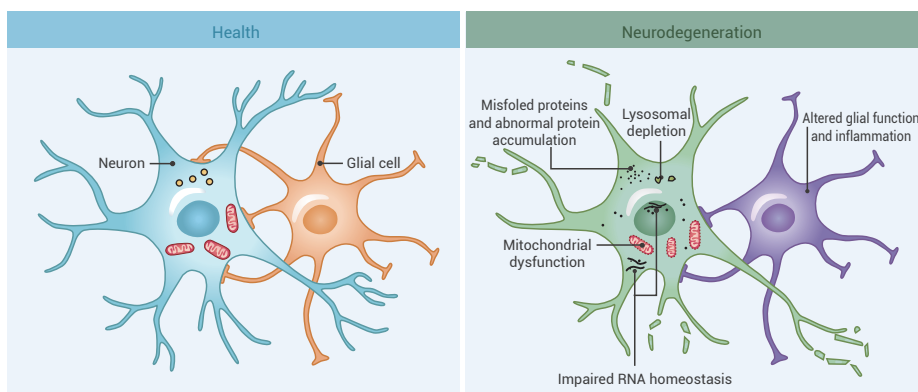


Figure 3. Major risk factors contribute to neurodegeneration [8]



## Compounds

Cat. No.	Product Name	Description
HY-115038	<b>ELN484228</b>	A blocker of $\alpha$ -synuclein which is a key protein in Parkinson's Disease.
HY-124876	<b>SynuClean-D</b>	A potent $\alpha$ -synuclein aggregation inhibitor for the treatment of Parkinson's Disease.
HY-N2099	<b>Onjisaponin B</b>	Accelerates the degradation of mutant $\alpha$ -synuclein, and exhibits potential therapeutic effects on Parkinson's Disease and Huntington's Disease.
HY-50882	<b>ELN 318463</b>	An amyloid precursor protein (APP) selective $\gamma$ -secretase inhibitor.
HY-W010041	<b>Scyllo-Inositol</b>	An amyloid inhibitor that lowers amyloid plaques in an Alzheimer's Disease mouse model.
HY-103374	<b>Phenserine</b>	An AChE inhibitor that inhibits $\beta$ -amyloid peptide formation. Improves cognitive performance and attenuates the progression of Alzheimer's Disease.
HY-N0064	<b>Macelignan</b>	Possesses therapeutic potentials against neurodegenerative diseases with oxidative stress and neuroinflammation.
HY-101860	<b>GIBH-130</b>	An effective inhibitor of neuroinflammation and significantly suppresses the IL-1 $\beta$ secretion by activating microglia.
HY-125999	<b>EPI-589</b>	A quinone derivative, which has the potential for the treatment of amyotrophic lateral sclerosis (ALS).
HY-122607	<b>DPA-714</b>	Evaluates for the specific imaging of inflammation in various models of neuroinflammation and in a brain tumor model.
HY-135749	<b>BN201</b>	Activates pathways associated with the response to stress and neuron survival. Neuroprotective effects.
HY-124293	<b>AA147</b>	An endoplasmic reticulum (ER) proteostasis regulator.
HY-15976	<b>P7C3</b>	An orally available and CNS penetrant aminopropyl carbazole, with neuroprotective effects.
HY-P1061A	<b>Colivelin TFA</b>	A brain penetrant neuroprotective peptide that has the potential for the treatment of Alzheimer's Disease and ischemic brain injury.
HY-17646	<b>Verdiperstat</b>	A selective, irreversible and orally active MPO inhibitor that can be used in the research of neurodegenerative brain disorders.
HY-105285	<b>Piromelatin</b>	A melatonin MT1/MT2 receptor agonist that possesses anti-neurodegenerative, anxiolytic and antidepressant potentials.

### Compound Screening Libraries

Cat. No. : HY-L054	Cat. No. : HY-L069
<b>Endoplasmic Reticulum Stress Compound Library</b> A unique collection of endoplasmic reticulum stress-related compounds that acts a useful tool for researching ER related diseases.	<b>Anti- Alzheimer's Disease Compound Library</b> A unique collection of compounds with anti-Alzheimer's Disease activities or targeting the unique targets of AD.
Cat. No. : HY-L070	
<b>Neuroprotective Compopund Library</b> A unique collection of compounds with potential neuroprotective activities.	

### Recombinant Proteins

Cat. No.	Product Name	Description
HY-P71752	<b>Tau Protein, Mouse</b>	The tau protein, implicated in neurodegenerative disorders known as tauopathies, is found in diseases like Alzheimer's disease.
HY-P72834	<b>APP/Protease Nexin-II, Human</b>	APP is a major component of neuritic plaques and cerebrovascular deposits in individuals with Alzheimer's disease and Down syndrome.
HY-P72840	<b>BACE1, Human</b>	BACE1 is critical in Alzheimer's disease pathology.
HY-P75588	<b>BACE-2, Mouse</b>	BACE-2 is critically involved in the proteolytic processing of APP.
HY-P70577	<b>alpha-Synuclein, Human</b>	Alpha-synuclein is a key neuronal protein that regulates synaptic activity, including vesicle transport and neurotransmitter release.
HY-P7531	<b>Apolipoprotein E, Human</b>	APOE is a key regulator of lipid metabolism and a leading genetic risk factor for Alzheimer's disease.
HY-P70577	<b>SNCA, Human</b>	Alpha-synuclein (SNCA) is a key neuronal protein that regulates synaptic activity.
HY-P72811	<b>Acetylcholinesterase/ACHE, Mouse</b>	AChE crucially impacts neurodegenerative diseases' pathogenesis via its influence on inflammatory response, apoptosis, oxidative stress, and pathological protein aggregation.



### Peptides

Cat. No.	Product Name	Description
HY-P0128	<b>β-Amyloid (25-35)</b>	β-Amyloid (25-35) is the fragment amyloid β-peptide, has shown neurotoxic activities in cultured cells.
HY-P1363	<b>β-Amyloid (1-42), human TFA</b>	β-Amyloid (1-42), human is a 42-mer amyloid β-peptide which plays a key role in the pathogenesis of Alzheimer disease.
HY-P1388	<b>β-Amyloid (1-42), (rat/mouse)</b>	β-Amyloid (1-42), (rat/mouse) shows cytotoxic effect on acute hippocampal slices, and used in the research of Alzheimer's disease.

### Antibody

Cat. No.	Product Name	Description
HY-P80480	<b>Phospho-Tau (Ser396) Antibody</b>	A non-conjugated and Rabbit originated monoclonal antibody.
HY-P81739	<b>Phospho-alpha Synuclein (Ser129) Antibody (YA1484)</b>	A non-conjugated and Rabbit originated monoclonal antibody.
HY-P80139	<b>GFAP Antibody (YA755)</b>	A non-conjugated and Mouse originated monoclonal antibody.
HY-P80349	<b>Stathmin 1 Antibody (YA050)</b>	A non-conjugated and Rabbit originated monoclonal antibody.
HY-P81215	<b>Neutrophil Elastase Antibody</b>	An unconjugated, approximately 26 kDa, rabbit-derived, anti-Neutrophil Elastase polyclonal antibody.
HY-P80241	<b>NeuN Antibody</b>	A non-conjugated and Rabbit originated monoclonal antibody.
HY-P80188	<b>Huntingtin Rabbit mAb</b>	A non-conjugated and Rabbit originated monoclonal antibody.
HY-P81119	<b>MTNR1A Antibody</b>	An unconjugated, rabbit-derived, anti-MTNR1A polyclonal antibody.
HY-P81100	<b>ChAT Antibody</b>	An unconjugated, rabbit-derived, anti-ChAT polyclonal antibody
HY-P81092	<b>DRD2 Antibody</b>	An unconjugated, rabbit-derived, anti-DRD2 polyclonal antibody
HY-P83498	<b>Sortilin Antibody (YA3243)</b>	An unconjugated, anti-Sortilin monoclonal antibody.
HY-P80136	<b>GABARAP Antibody</b>	A non-conjugated monoclonal antibody, targeting to GABARAP.

## Blood Brain Barrier

The blood-brain barrier (BBB) protects the central nervous system (CNS) from the peripheral blood circulation and supplies the brain with the required nutrients for normal function. It is a multicellular vascular structure that mainly composed of brain microvascular endothelial cells (ECs), pericytes, astrocytes and the basement membrane (Figure 4). ECs cells contribute to the barrier property by forming tight junctions (TJs) and limiting transcytosis. Pericytes are cells that cover capillaries and play important roles in the formation, maturation and maintenance of BBB. Astrocytes participate in BBB maintenance and ion/water transport by interacting with ECs and pericytes. For the important roles in maintaining the homeostasis of CNS, BBB disruption has been found in a variety of neurological disorders. Meanwhile, BBB is also an obstacle to deliver beneficial drugs to treat CNS diseases or brain tumors, as it has the least permeable capillaries in the entire body. Therefore, it is crucial to discover drugs which can regulate this barrier for the treatment of brain-based diseases, such as Alzheimer's Disease (AD), Parkinson's Disease (PD) and Epilepsy.

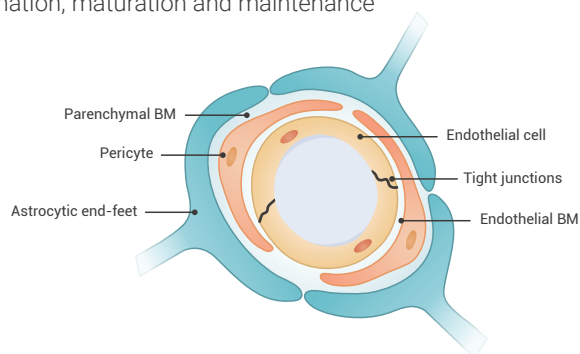


Figure 4. Schematic of blood-brain barrier <sup>[9]</sup>

### Compounds & Compound Screening Libraries

Cat. No.	Product Name	Description
HY-114426	AT-1002	A tight junction regulator and absorption enhancer.
HY-15204	Tonabersat (SB-220453)	A gap-junction modulator that prevents inflammatory damage in the central nervous system.
HY-P0139	Gap 27	A synthetic Cx43 mimetic peptide. A gap junction inhibitor.
HY-10913	Danegaptide (GAP-134)	An orally active gap-junction modifier with an antiarrhythmic effect.
HY-13779	J-147	A CNS penetrant neuroprotective agent for cognitive enhancement.
HY-136341	7,8-Dihydroneopterin	Induces cellular apoptosis in astrocytes and neurons and can be used in the research of neurodegenerative diseases.
HY-107661	Arundic Acid	An astrocyte-modulating agent, which has the potential for stroke and Alzheimer's Disease research.
HY-10052	Aprepitant (MK-0869)	A neurokinin 1 receptor antagonist. Approved by FDA for the treatment of chemotherapy-induced nausea.
HY-100740	Lanabecestat (AZD3293)	A CNS penetrating BACE1 inhibitor for the treatment of Alzheimer's Disease.

Cat. No.	Product Name	Description
HY-104003	<b>S 38093</b>	A CNS penetrating antagonist of H3 receptor that enhances hippocampal neurogenesis.
HY-108295	<b>Pivagabine (CXB-722)</b>	A hydrophobic 4-aminobutyric acid derivative with neuromodulatory activity.
HY-108710	<b>VU0650786</b>	A CNS penetrant negative allosteric modulator of mGlu3 NAM.
HY-114153	<b>PLX5622</b>	A highly selective brain penetrant and oral active CSF1R inhibitor for extended and specific microglial elimination.
HY-N0304	<b>L-DOPA</b>	An orally active and CNS permeant metabolic precursor of neurotransmitter dopamine for Parkinson's Disease.
HY-110256	<b>N-Acetylcysteine amide</b>	A blood brain barrier permeant thiol antioxidant and a neuroprotective agent, reduces ROS production.
HY-15608	<b>MPTP</b>	A brain penetrant dopamine neurotoxin, inducing Parkinson's Disease.
HY-12599	<b>URMC-099</b>	An orally bioavailable and potent MLK3 inhibitor that has excellent blood-brain barrier penetration properties.
HY-15976	<b>P7C3</b>	An orally bioavailable and blood-brain barrier penetrant aminopropyl carbazole, with neuroprotective effects.

### Compound Screening Library

Cat. No. : HY-L028

#### CNS-Penetrant Compound Library

A unique collection of bioactive CNS-penetrant compounds for the discovery of drugs used for brain diseases.

#### References:

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