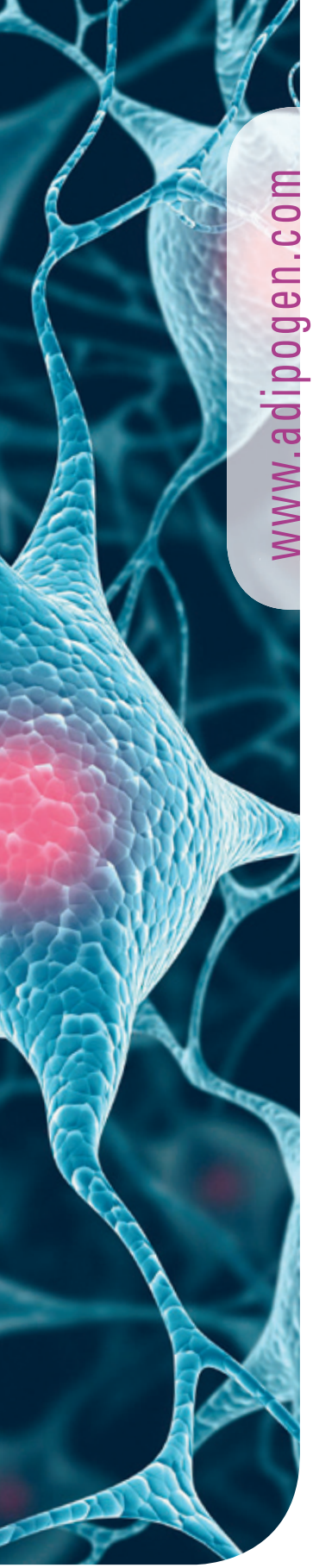

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AdipoGen®
Connecting Immunology to Metabolism™

International Edition

THE EXPERT SOURCE FOR NEUROSCIENCE

Neuroscience Research

Netrin-1 – A Dependence Receptor Ligand with Multiple Functions

Netrin-1 is a guidance molecule that triggers either attraction or repulsion effects on migrating axons of neurons, interacting with the receptors **DCC** or **UNC5** (A to D). It has been proposed that DCC and UNC5 are dependence receptors that, in the absence of netrin-1, promote apoptosis. This pro-apoptotic activity requires initial caspase cleavage of the receptor's intracellular domain. Netrin-1 is therefore a pro-survival factor acting by blocking cell death induced by its unbound receptors. Netrin-1 protects neurons from death during development and favors tumor epithelial cells survival in some types of cancers. It interacts with the orphan amyloid precursor protein (APP), a protein component of the amyloid plaques that are associated with Alzheimer's disease (AD). Netrin-1 also inhibits remyelination of neurons in Multiple Sclerosis (MS) (and other progressive demyelinating diseases) by inhibiting oligodendrocyte precursor migration.

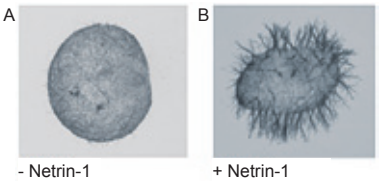
REVIEWS: Netrin-1 in the developing enteric nervous system and colorectal cancer: S.Y. Ko, et al.; Trends Mol. Med. **18,** 544 (2012)

Biologically Active Netrin-1

Netrin-1 (human):Fc (human) (rec.)
AG-40B-0075-C010 10 µg

FIGURE: Netrin-1 (human):Fc (human) (rec.) (Prod. No. AG-40B-0075) induces outgrowth of the commisural axon.

METHOD: Dorsal spinal cords were dissected out from E13 rat embryos and cultured in collagen matrix in the presence or absence of netrin-1 (250ng/ml). Axons were then stained with an anti-β-tubulin antibody.



Picture courtesy of Dr. Véronique Corset, Prof. Patrick Mehlen lab, Centre Léon Bérard, Lyon

- **Full biological activity (tested by the key experts)**
- **Does not aggregate – Does not precipitate**
- **Large batch sizes are available for reproducible results**

Also available:

Netrin-1 (human) (rec.)
AG-40B-0040 10 µg | 3 x 10 µg

UNCB5 (human):Fc (human) (rec.)
AG-40B-0037 50 µg | 3 x 50 µg

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AdipoGen®
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Neuroinflammation and Inflammasomes

Neuroinflammation is an **innate immune response in the CNS** against harmful and irritable stimuli such as pathogens, metabolic toxic waste or chronic mild stress and that occurs in response to trauma, infections and/or neurodegenerative diseases. The main cell types contributing to the innate immune response are microglia, trafficking macrophages and astrocytes. These cells constantly survey the proximal environment through pattern-recognition receptors (PRRs) such as Toll-like receptors (TLRs), scavenger receptors (SRs) and **NOD-like receptors (NLRs)** (e.g. inflammasome complexes). These receptors recognize not only exogenous pathogen-associated molecular patterns (PAMPs) but also endogenous modified molecules called damage-associated molecular patterns (DAMPs). After activation and release of immune molecules (e.g. cytokines), the innate immune system launches inflammatory and regulatory responses in order to counteract infection, injury and maintenance of tissue homeostasis. Although the evolutionary function is neuroprotective, innate immune responses can also promote immunopathology when they are excessive (e.g. chronic neuroinflammation). During chronic activation the sustained exposure of neurons to pro-inflammatory mediators can cause neuronal dysfunction and contribute to cell death. As chronic neuroinflammation is observed at relatively early stages of neurodegenerative diseases, targeting the mechanisms that drive this process may be useful for diagnostic and therapeutic purposes.

Neuroinflammation is **mediated by protein complexes known as inflammasomes**. Inflammasomes function as intracellular sensors for infectious agents as well as for host-derived danger signals that are associated with neurological diseases, including meningitis, stroke and Alzheimer's disease (AD). The inflammasome can be activated in the CNS under diverse conditions that trigger inflammation, including acute infection (e.g. viruses, bacteria), chronic sterile inflammation (e.g. misfolded proteins such as amyloid-β, α-synuclein and prion protein) and acute sterile injury (ATP excess) (see Figure). Assembly of an inflammasome activates pro-inflammatory caspase-1, which then cleaves the precursor forms of pro-inflammatory cytokines IL-1β and IL-18 into their active forms. These pro-inflammatory cytokines promote a variety of innate immune processes associated with infection, inflammation and autoimmunity, and play an instrumental role in the onset of neuroinflammation and subsequent occurrence of neurodegenerative diseases, cognitive impairment and dementia. In particular, NLRP1/2/3 and NLRC4 inflammasomes may also have a role in the etiologies of depression, Alzheimer's disease (AD) and in metabolic disorders, such as Type II diabetes, obesity and cardiovascular diseases that have been shown to be co-morbid with psychiatric illnesses.

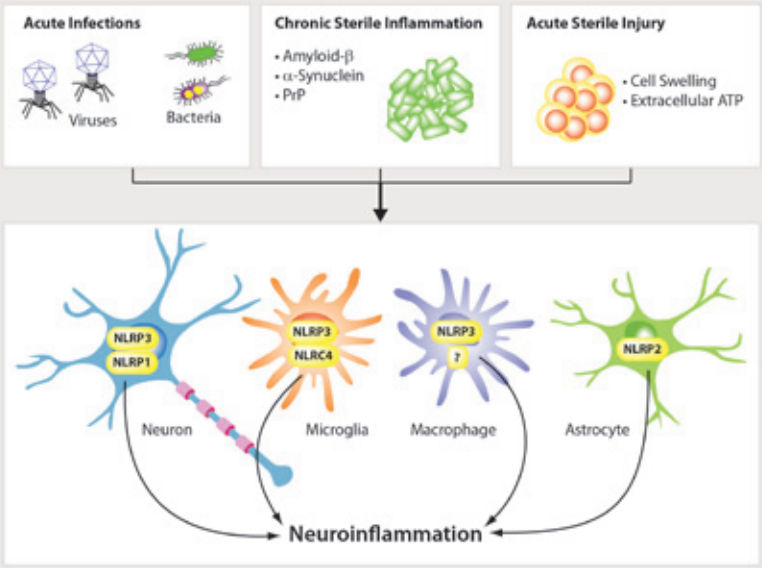


FIGURE: Activation factors, inflammasome complexes and target cells in the CNS.

SELECTED REVIEWS: Inflammasomes in the CNS: J.G. Walsh, et al.; Nat. Rev. Neurosci. **15,** 84 (2014) • Innate immune activation in neurodegenerative disease: M.T. Heneka, et al.; Nat. Rev. Immunol. **14,** 463 (2014) • Inflammation in neurodegenerative diseases-an update: S. Amor, et al.; Immunol. **142,** 151 (2014)

UNIQUE

THE STANDARD NLRP3 Antibody

anti-NLRP3/NALP3, mAb (Cryo-2)

AG-20B-0014-C100 — 100 µg

CLONE	Cryo-2
ISOTYPE	Mouse IgG2b
IMMUNOGEN	Recombinant mouse NLRP3/NALP3 (pyrin domain/aa 1-93)
APPLICATION	ICC, IHC, IP, WB (1µg/ml) (see online protocol)
SPECIFICITY	Recognizes human and mouse NLRP3/NALP3

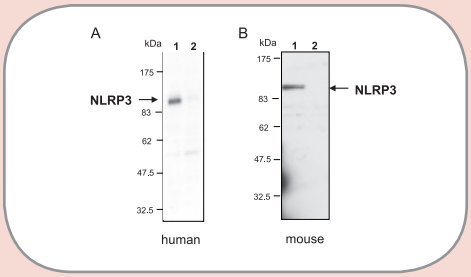


FIGURE: Human and mouse NLRP3/NALP3 are detected in THP1 cells or mouse macrophages, respectively, using anti-NLRP3/NALP3, mAb (Cryo-2) (Prod. No. AG-20B-0014).

METHOD: A) Cell extracts from the human cells THP1 (lane 1) or THP1 expressing shRNA-hNLRP3 (lane 2); B) Cell extracts from mouse macrophages, WT (lane 1) or NLRP3/NALP3 KO (lane 2), were separated by SDS-PAGE, transferred to nitrocellulose and incubated with anti-NLRP3/NALP3, mAb (Cryo-2) (1µg/ml). Proteins were visualized by a chemiluminescence detection system.

APPLICATIONS: **ICC:** Immunocytochemistry; **IHC:** Immunohistochemistry **IP:** Immunoprecipitation; **WB:** Western blot **SPECIES:** **Hu** = Human; **Ms** = Mouse; **Rt** = Rat; **Rb** = Rabbit; **Prm** = Primate

Selected Unique Inflammasome Reagents from the Expert!

PRODUCT NAME	PID	SIZE	SOURCE/ISOTYPE	SPECIES	APPLICATION
Signaling Antibodies					
anti-Asc [Pycard], pAb (AL177)	AG-25B-0006	100 µg	Rabbit	Hu, Ms	ICC, IHC, IP, WB, FUNC (Blocking)
anti-Asc [Pycard], pAb (AL177) (preservative free)	AG-25B-0006PF	100 µg	Rabbit	Hu, Ms	ICC, IHC, IP, WB, FUNC (Blocking)
anti-Asc [Pycard], pAb (AL177) (ATTO 647N)	AG-25B-0006TS	100 µg	Rabbit	Hu, Ms	ICC, IHC
Cytosolic PAMPs Sensors					
anti-Caspase-4/11 (p20), mAb (Flamy-1)	AG-20B-0060	100 µg	Mouse IgG2bκ	Hu, Ms	IP, WB
anti-Caspase-4/11 (p20), mAb (Flamy-1) (Biotin)	AG-20B-0060B	100 µg	Mouse IgG2bκ	Hu, Ms	IP, WB
anti-Caspase-11 (p20) (mouse), mAb (Flamy-2)	AG-20B-0061	100 µg	Mouse IgG2bκ	Ms	ELISA, WB

Unique mAbs to Detect Activated (p10 & p20) Mouse Caspase-1 by WB

anti-Caspase-1 (p10) (mouse), mAb (Casper-2)

AG-20B-0044-C100		100 µg
AG-20B-0044B-C100	Biotin	100 µg

anti-Caspase-1 (p20) (mouse), mAb (Casper-1)

AG-20B-0042-C100		100 µg
AG-20B-0042B-C100	Biotin	100 µg

anti-Caspase-1 (p20) (human), mAb (Bally-1)

AG-20B-0048-C100		100 µg
AG-20B-0048B-C100	Biotin	100 µg

- **Purified mouse monoclonal antibodies (mAbs)**
- **Casper-1 detects the endogenous full-length & activated p20 fragment**
- **Casper-2 detects the endogenous full-length & activated p10 fragment**
- **Outstanding tools to monitor inflammasome activation**
- **Tested by experts in the inflammasome signaling field**
- **Protein precipitation from supernatants is not required**

Described in Literature

Bally-1 detects endogenous full-length and activated p20 fragment

Also available: Unique Caspase-1 (mouse) ELISA Kits for the Quantitative Measurement of Inflammasome Activation

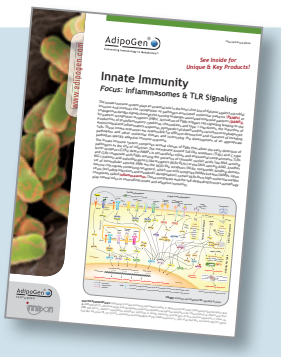
Flagellin – TLR5/NLRC4 Agonist

THE SOURCE

Toll-like receptors (TLR) are innate immunity-related receptors of inflammatory stimuli expressed at the surface of many immune cells, including glial cells in the brain. Peroxisome proliferator-activated receptor β/δ (PPARβ/δ) is a potential regulator of neuroinflammation. It has been reported that TLR ligands such as Flagellin induced expression and activity of PPARβ/δ expression in astrocytes suggesting that the TLR/PPARβ/δ pathway is involved in the regulation of neuroinflammation.
AdipoGen® offers different types of **low endotoxin** and high purity flagellins including pathway specific mutants. The **Flagellin (NLRC4 Mutant) (rec.)** is only detected by TLR5 not by NLRC4, whereas the **Flagellin (TLR5 Mutant) (rec.)** is only detectd by NLRC4.

PRODUCT NAME	PID	SIZE
Flagellin	AG-40B-0095	100 µg
Flagellin (high purity)	AG-40B-0025	10 µg | 3 x 10 µg
Flagellin (rec.)	AG-40B-0125	10 µg | 3 x 10 µg
new Flagellin (NLRC4 Mutant) (rec.)	AG-40B-0126	10 µg | 3 x 10 µg
new Flagellin (TLR5 Mutant) (rec.)	AG-40B-0127	10 µg | 3 x 10 µg

Ask for AdipoGen®'s Innate Immunity Brochure for a comprehensive Overview on Unique Inflammasome and TLR Reagents!



Notch Signaling and CNS

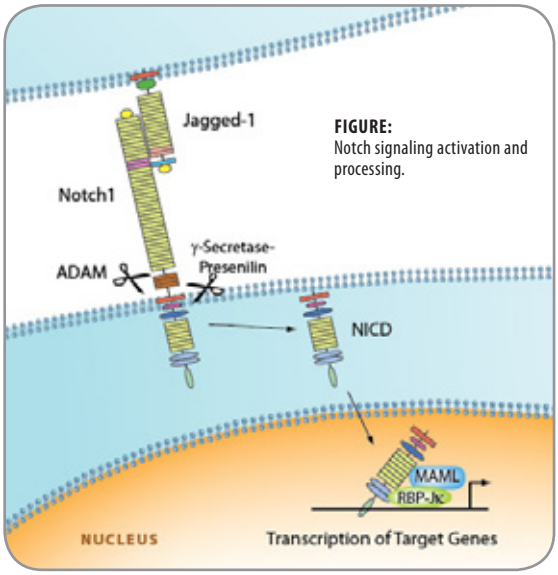


FIGURE:
Notch signaling activation and processing.

Notch signaling is initiated and activated by direct cell-cell interactions that facilitate binding between the four Notch receptor isoforms (Notch1-4) to the transmembrane Notch ligands Delta (DLL1 and DLL4) or Jagged-type (Jagged-1 and Jagged-2). These ligands initiate the proteolytic cleavage of Notch receptors by the metalloproteases TACE (ADAM17) or ADAM10, which then are further processed by a γ-secretase-presenilin complex, which releases the cytosolic portion of Notch receptors. This intracellular domain of Notch (NICD) translocates into the cell nucleus, induces transcriptional processes and the expression of target genes and consequently proteins (e.g. HES). Notch signaling inhibits neuronal differentiation in the developing central nervous system and is implicated in the maintenance of neuronal stem cells (NSCs), regulating differentiation, self-renewal, neurogenesis and gliogenesis. Recent findings suggest that Notch signaling pathway could be implicated in pathogenesis of neurodegenerative disorders.

SELECTED REVIEWS: Notch signaling in the central nervous system with special reference to its expression in microglia: L. Yao, et al.; CNS Neurol. Disord. Drug Targets **12,** 807 (2013) • Notching up neural stem cell homogeneity in homeostasis and disease: C. Giachino & V. Taylor; Front. Neurosci. **8,** 32 (2014)

BULK

Biologically Active Notch Proteins

Notch Receptors

Notch1 (mouse):Fc (human) (rec.)
AG-40B-0109 — 50 µg | 3 x 50µg

Notch2 (mouse):Fc (human) (rec.)
AG-40B-0110 — 50 µg | 3 x 50µg

Notch Ligands

DLK1 (human) (rec.)
AG-40A-0133 — 10 µg | 50 µg

DLK1 (human):Fc (human) (rec.)
AG-40B-0152 — 10 µg | 50 µg

DLK1 (mouse):Fc (human) (rec.)
AG-40A-0107Y — 10 µg | 50 µg

DLL1 (human) (rec.)
AG-40A-0073 — 10 µg | 50 µg

DLL1 (human):Fc (human) (rec.)
AG-40A-0116Y — 10 µg | 50 µg

DLL1 (mouse):Fc (human) (rec.)
AG-40A-0148 — 10 µg | 50 µg

DLL3 (human) (rec.)
AG-40B-0151 — 10 µg | 50 µg

DLL3 (ED) (mouse):Fc (human) (rec.)
AG-40A-0178 — 10 µg

DLL4 (human):Fc (human) (rec.)
AG-40A-0077Y — 10 µg | 50 µg

DLL4 (mouse):Fc (human) (rec.)
AG-40A-0145 — 10 µg | 50 µg

Jagged-1 (human):Fc (human) (rec.)
AG-40A-0081 — 10 µg | 50 µg

Jagged-1 (mouse):Fc (human) (rec.)
AG-40A-0157 — 10 µg | 50 µg

Jagged-2 (human):Fc (human) (rec.)
AG-40A-0155Y — 10 µg

Jagged-2 (mouse):Fc (human) (rec.)
AG-40A-0183 — 10 µg | 50 µg

Notch Target

HES1 (human) (rec.) (His)
AG-40A-0180 — 10 µg | 50 µg

Notch Processing / γ-Secretase Inhibitors

Compound E
AG-CR1-0081 — 250 µg | 1 mg | 5 mg

Compound 34
AG-CR1-0007 — 200 µg | 1 mg

DAPT
AG-CR1-0016 — 5 mg | 25 mg

Visit www.adipogen.com for a complete Overview on Notch Signaling Proteins, Antibodies and ELISA Kits!

Progranulin – Marker of Neuroinflammation

Progranulin (PGRN) is a cysteine-rich protein, that shows multifunctional biological activities, including major roles in cancer, inflammation, metabolic disease and neurodegeneration, especially as a valuable biomarker for Frontotemporal Lobar Degeneration (FTLD). In the brain, PGRN is primarily expressed in mature neurons and microglia. The absence of progranulin in microglia causes increased production and release of multiple cytokines. It is anticipated that PGRN affects microglial proliferation, recruitment, differentiation, activation and phagocytosis, suggesting that PGRN plays a central role in the regulation of neuroinflammatory responses. Extracellular progranulin can be endocytosed through the sortilin receptor and delivered to lysosomes. In neurons, PGRN i) enhances survival and neurite outgrowth through modulation of GSK-3β, ii) co-localizes in late endosomes and early lysosomes with the transmembrane protein TMEM106B, iii) co-localizes with markers such as BDNF along axons and iv) influences synaptic structure and function at synaptic and extra-synaptic sites, where it is secreted in an activity-dependent manner. Therefore, ongoing research has implicated PGRN in multiple neurodegenerative diseases in addition to its prominent role as a cause of FTLD.

SELECTED REVIEWS: Progranulin: at the interface of neurodegenerative and metabolic diseases: A.D. Nguyen, et al.; Trends Endocrinol. Metab. **24,** 597 (2013) • Progranulin in neurodegenerative disease: T.L. Petkau & B.R. Leavitt; TINS **37,** 388 (2014)

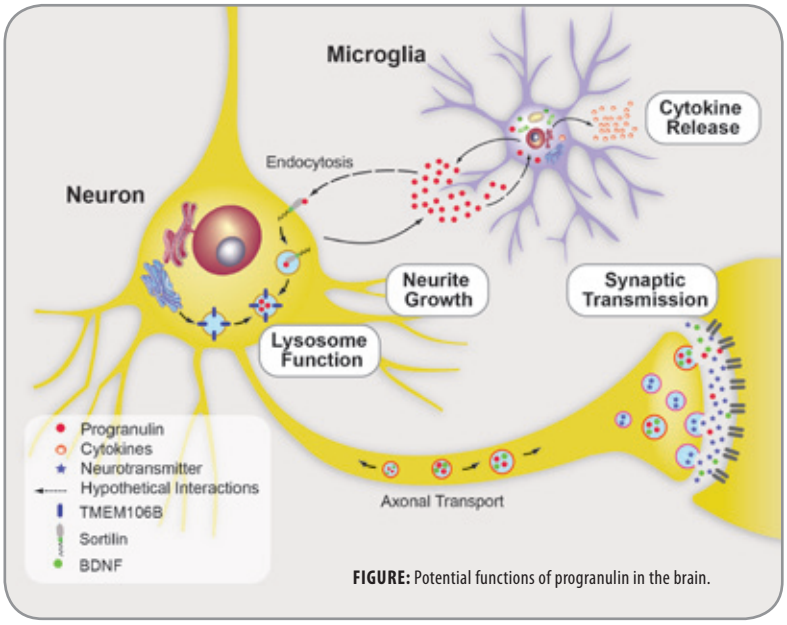


FIGURE: Potential functions of progranulin in the brain.

Tag-free Progranulins – Unique Tools for *in vivo* Research

Progranulin (human) (rec.) (untagged)
AG-40A-0188 10 µg | 50 µg | BULK

Progranulin (mouse) (rec.) (untagged)
AG-40A-0189 10 µg | 50 µg | BULK

- **Higher activity compared to tagged Progranulins**
- **Suitable for *in vitro* and *in vivo* studies**
- **Reflects the native sequence with no additional amino acids**
- **Correct processed protein (at the N-terminus)**
- **Affinity purified**
- **Low endotoxin levels (<0.1EU/µg)**

AdipoGen®
Connecting Immunology to Metabolism™

THE STANDARD

Progranulin ELISA Kits

Progranulin (human) ELISA Kit

AG-45A-0018YEK-KI01		1 x 96 wells
AG-45A-0018YTP-KI01	Twin Plex	2 x 96 wells
AG-45A-0018YPP-KI01	Penta Plex	5 x 96 wells

Direct measurement of human progranulin in human serum, plasma or cell culture supernatants. **SENSITIVITY:** 32pg/ml.

Progranulin (mouse) ELISA Kit

AG-45A-0019YEK-KI01		1 x 96 wells
AG-45A-0019YTP-KI01	Twin Plex	2 x 96 wells
AG-45A-0019YPP-KI01	Penta Plex	5 x 96 wells

Direct measurement of mouse progranulin in mouse serum or cell culture supernatants. **SENSITIVITY:** 60pg/ml.

Adiponectin — Linking Metabolic and Neurodegenerative Diseases

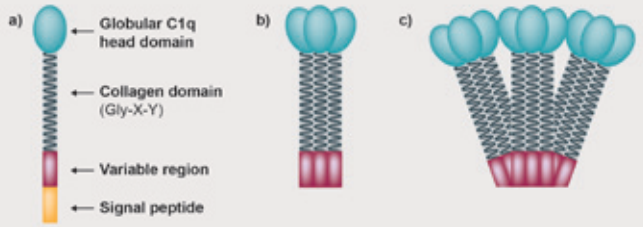


FIGURE: Structural organization of Adiponectin: a) Domain structure; b) Homotrimeric structure; c) Higher-order protein structure.

Adiponectin is an important adipocyte-derived hormone that regulates metabolism of lipids and glucose and its receptors (AdipoR1, AdipoR2, T-cadherin) appear to exert actions in peripheral tissues by activating the AMP-activated protein kinase, p38-MAPK, PPARα and NF-κB. Adiponectin is the most abundant adipokine in the circulation and its levels are substantially reduced in obesity. In peripheral tissues, adiponectin exerts a wide range of beneficial physiological actions, including anti-diabetic, anti-inflammatory, anti-atherosclerotic and cardioprotective effects.

Growing evidence suggests that neurodegenerative diseases are associated with metabolic disorders and AdipoR expression and functionality has been shown to extend to the CNS. Neurons express different subsets of AdipoRs. In primary human astrocytes globular adiponectin was shown to induce astrocyte inflammation. It was suggested that LMW (Low Molecular Weight) trimers may be the active forms in the CNS compared to oligomers in peripheral tissues. Due to the prominent role of brain inflammation in Alzheimer's disease (AD), astrocyte inflammation induced by globular adiponectin could be involved in AD-related pathology. AdipoRs appear to be intimately involved in several neurodegenerative disorders including AD, Multiple Sclerosis (MS), epilepsy and ischaemic stroke, which implies a broad functionality of these receptors in neurological disease. AdipoRs and adiponectin may emerge as targets to find new therapies for neurodegenerative disorders.

SELECTED REVIEWS: Adiponectin receptor signalling in the brain: J. Thundyil, et al.; Br. J. Pharmacol. **165,** 313 (2012) • Adiponectin and Alzheimer's disease: Is there a link? Infl. Cell Signal. **1,** e154 (2014)

BULK

Selected Adiponectin Products

Proteins

Adiponectin (human) (rec.)
AG-40B-0030 — 50 µg

Adiponectin (trimeric form) (human) (rec.)
AG-40A-0143 — 10 µg | 50 µg

Adiponectin (GD) (human) (rec.) (His)
AG-40A-0005 — 50 µg

Adiponectin (mouse) (rec.)
AG-40A-0002 — 50 µg

Adiponectin (GD) (mouse) (rec.) (His)
AG-40A-0007 — 50 µg

GD = Globular Domain

Receptor Antibodies

Adiponectin Receptor 1 (human), pAb (AL238)
AG-25B-0010 — 100 µl

Adiponectin Receptor 2 (mouse), pAb (AL241)
AG-25B-0012 — 100 µl

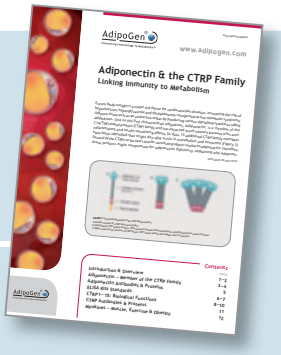
STANDARD Adiponectin ELISA Kits

Adiponectin (human) Competitive ELISA Kit
AG-45A-0002 — 96 wells | TwinPlex | PentaPlex

Adiponectin (human) ELISA Kit
AG-45A-0001Y — 96 wells | TwinPlex | PentaPlex

Adiponectin (mouse) ELISA Kit
AG-45A-0004 — 96 wells | TwinPlex | PentaPlex

Ask for AdipoGen®'s Adiponectin Brochure for a comprehensive Overview!



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The Leader in Metabolic Research!
Trust our Expertise!

Neurochemicals *from the Manufacturer*

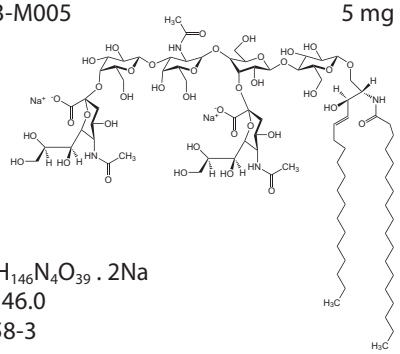
PRODUCT NAME	ACTIVITY	PID	SIZE
Cyclopenin	AChE inhibitor	AG-CN2-0134	1 mg | 5 mg
Territrem B	AChE inhibitor	AG-CN2-0142	500 µg | 1 mg
Quinolactacin A	AChE inhibitor	AG-CN2-0164	1 mg | 5 mg
Hyperforin . DCHA	TRPC6 channel activator	AG-CN2-0008	500 µg | 1 mg
Umbellulone	Selective TRPA1 activator	AG-CN2-0085	10 mg
SB366791	Potent TRPV1 antagonist	AG-CR1-0034	5 mg | 25 mg
Amauromine	CB1 receptor antagonist	AG-CN2-0113	250 µg | 1 mg
SNC80	δ-Opioid receptor agonist	AG-CR1-0017	5 mg | 25 mg
Pimprinine	Monoamine oxidase inhibitor	BVT-0297	1 mg | 5 mg
Luteolin	Monoamine transporter activator	AG-CN2-0098	5 mg | 25 mg
Debromohymenialdisine	Potential anti-Alzheimer agent	AG-CN2-0068	100 µg
Fulvic acid	Tau and Aβ aggregation inhibitor	AG-CN2-0135	1 mg | 5 mg
Papaverine . HCl	PDE10A inhibitor	AG-CN2-0414	1 g | 5 g
Thiocolchicoside	GABA(A) receptor antagonist	AG-CN2-0076	1 mg | 5 mg | 25 mg
Bilobalide	GABA(A) receptor antagonist	AG-CN2-0026	10 mg | 50 mg
Finasteride	GABA activity enhancer	AG-CR1-3589	25 mg | 100 mg
20-Hydroxyecdysone	Neurosteroid. Acts on GABA(A) receptor	AG-CN2-0072	5 mg | 10 mg | 50 mg
Ionomycin (free acid)	Potent Ca^{2+} ionophore	AG-CN2-0416	1 mg | 5 mg
EM574 [Motilide]	Motilin receptor agonist	AG-CN2-0102	250 µg | 1 mg
Lactacystin	β-Secretase activity inhibitor	AG-CN2-0104	100 µg | 200 µg | 500 µg | 1 mg
NG 012	NGF potentiator	AG-CN2-0155	1 mg | 5 mg
Pseurotin D	Neuroleptic agent	BVT-0426	1 mg | 5 mg
epi-Aszonalenin A	Substance P inhibitor	AG-CN2-0163	1 mg | 5 mg
Okadaic acid (high purity)	Potent neurotoxin	AG-CN2-0056	25 µg | 100 µg | 1 mg
Okadaic acid . NH4 (high purity)	Potent neurotoxin	AG-CN2-0058	25 µg | 100 µg | 1 mg
Okadaic acid . K (high purity)	Potent neurotoxin	AG-CN2-0060	25 µg | 100 µg | 1 mg
Okadaic acid . Na(high purity)	Potent neurotoxin	AG-CN2-0062	25 µg | 100 µg | 1 mg
Roquefortine C	Potent neurotoxin	AG-CN2-0002	1 mg
Verruculogen	Neurotoxin	BVT-0443	1 mg | 5 mg
MTEP	Potent mGluR5 antagonist	AG-CR1-0022	5 mg | 25 mg

Gangliosides

THE SOURCE

Ganglioside GD1a . disodium salt

AG-CN2-9003-M001 1 mg
AG-CN2-9003-M005 5 mg



Formula: $C_{84}H_{146}N_4O_{39}$. 2Na
MW: 1836.1 . 46.0
CAS: 12707-58-3

Ganglioside GM1 . Na
AG-CN2-9000 1 mg | 5 mg | 10 mg

Ganglioside GM3 . Na
AG-CN2-9002 1 mg

Ganglioside GT1b . 3Na
AG-CN2-9006 1 mg | 5 mg

Ganglioside GQ1b . 4Na
AG-CN2-9007 100 µg | 500 µg

Asialo-Ganglioside GM1
AG-CN2-9008 500 µg | 1 mg

Also available:
Gangliosides GM2, GD3, Asialo-GM2, GD1b.

UNIQUE

Polyglutamylation – Importance in Neurodegeneration

Polyglutamylation is a reversible post-translational modification (PTM), defined as the enzymatic addition of Glu residues onto the γ-carboxyl group of gene-encoded glutamate residues of the modified proteins. This generates multiple negative charges that regulate the interaction of microtubules with other proteins, including both microtubule-associated proteins (MAPs) and molecular motors. Polyglutamylation may regulate microtubule stability. Particularly high levels are found on centrioles, on the axonemes of cilia and flagella and in neurons, suggesting a key role in neurons. Hyperglutamylation has been linked to neurodegeneration underscoring the importance of balanced levels of microtubule polyglutamylation for neurons. Additionally, increased levels of tubulin polyglutamylation have been reported in cancer cells. Identification of polyglutamylation on substrates other than tubulin indicates that this modification could be a potential regulator of diverse cellular processes, including cell division, cell motility, cell signaling, neuronal development and brain function.

REVIEW: Tubulin post-translational modifications: encoding functions on the neuronal microtubule cytoskeleton: C. Janke & M. Kneussel; TINS **33**, 362 (2010)

Unique Polyglutamylation-specific Antibody!

Polyglutamylation Modification, mAb (GT335)

AG-20B-0020		100 µg
AG-20B-0020B	Biotin	100 µg

Also available:

Rab6-GTP, mAb (rec.) (AA2)

AG-27B-0004		100 µg
AG-27B-0004TD	ATTO 488	100 µg

Tubulin-GTP, mAb (rec.) (MB11)

AG-27B-0009		100 µg

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The Expanding Role of Caspases in the CNS

Caspases are broadly classified as being either pro-inflammatory or pro-apoptotic. In neurological diseases, inflammatory caspases promote immune activation, whereas apoptotic caspases are activated in neurons in response to immune molecule-mediated cytotoxicity, diminished growth factor signaling and excitotoxicity. Caspases also regulate non-apoptotic forms of programmed cell death (e.g. necroptosis, pyroptosis). Caspase pathways are targets that are of therapeutic relevance.

AdipoGen® (www.adipogen.com) offers a broad range of cell death-related antibodies and inhibitors.

New Caspase-specific Antibodies!

Caspase-2, mAb (10C6)	AG-20T-0135
Caspase-2, mAb (11B4)	AG-20T-0136
Caspase-8 (mouse), mAb (1G12)	AG-20T-0137
Caspase-8 (mouse), mAb (3B10)	AG-20T-0138
Caspase-11 (mouse), mAb (8A5)	AG-20T-0139
Caspase-11 (mouse), mAb (4E11)	AG-20T-0140
Caspase-12 (mouse), mAb (12G6)	AG-20T-0141

Other New Related Antibodies!

Apaf-1 (human), mAb (2E12)	AG-20T-0132
Apaf-1 (mouse/rat), mAb (13F11)	AG-20T-0133
Apaf-1, mAb (18H2)	AG-20T-0134
Bmf (mouse/rat), mAb (17A9)	AG-20T-0131
Bmf, mAb (9G10)	AG-20T-0130
BimS/EL/L, mAb (3C5)	AG-20T-0142
BimS/EL/L, mAb (10B12)	AG-20T-0143

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Asiatic acid | Asiaticoside | Astaxanthin | (+)-Catechin . hydrate | Curcumin | (-)-Epigallocatechin gallate | Eupatilin | FK-506 | 1,5-Isoquinolinediol | MnTBAP chloride | MnTMPyP . pentachloride | Paxilline | PD 150,606 | Piceatannol | Quercetin . dihydrate | Rapamycin | Resveratrol | Rutin . trihydrate | Sauchinone | Stigmasterol | Vitexin | Wogonin | Xanthorrhizol

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