

CELLUTIONS BIOSYSTEMS NEURONAL CELL LINES FROM CEDARLANE



CEDARLANE

CELLutions Biosystems Neuronal Cell Lines

Mouse and Rat Hypothalamus

Mouse Hippocampus

Mouse Pituitary

Mouse Motor Neuron-Like

Human Oligodendrocyte

Human Cerebral Microvascular Endothelium

Antibodies

www.cedarlanelabs.com/Cellutions

Neuronal Cell Lines from CELLutions Biosystems

Hypothalamic Cell Lines

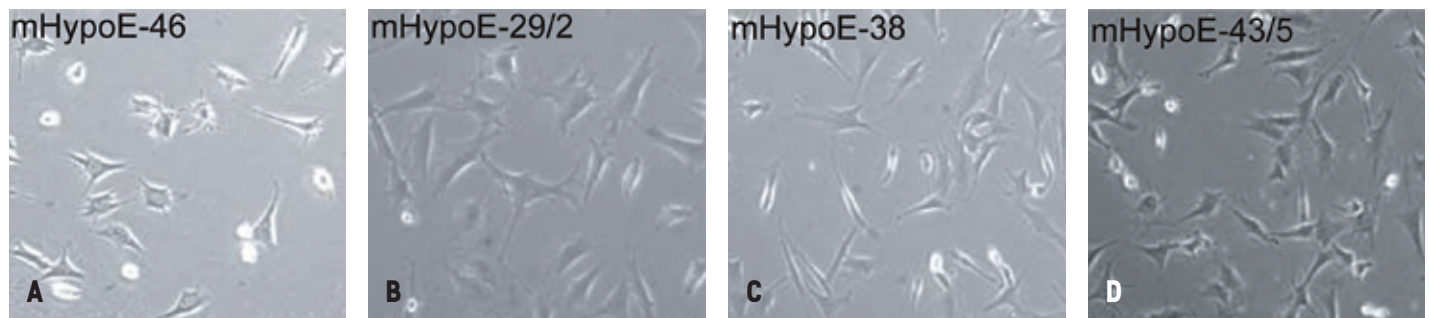
CELLutions Biosystems offers a unique line of phenotypically different clones generated from:

Embryonic Mouse Hypothalamus cells	38 cell lines designated mHypoE-xx	Cat. # CLU101 – CLU139
Embryonic Rat Hypothalamus cells	19 cell lines designated rHypoE-xx	Cat. # CLU201 – CLU222
Adult Mouse Hypothalamus cells (Male)	21 cell lines designated mHypoA-xx	Cat. # CLU172 – CLU192
Adult Mouse Hypothalamus cells (Female)	23 cell lines designated mHypoA-xx	Cat. # CLU450 – CLU472

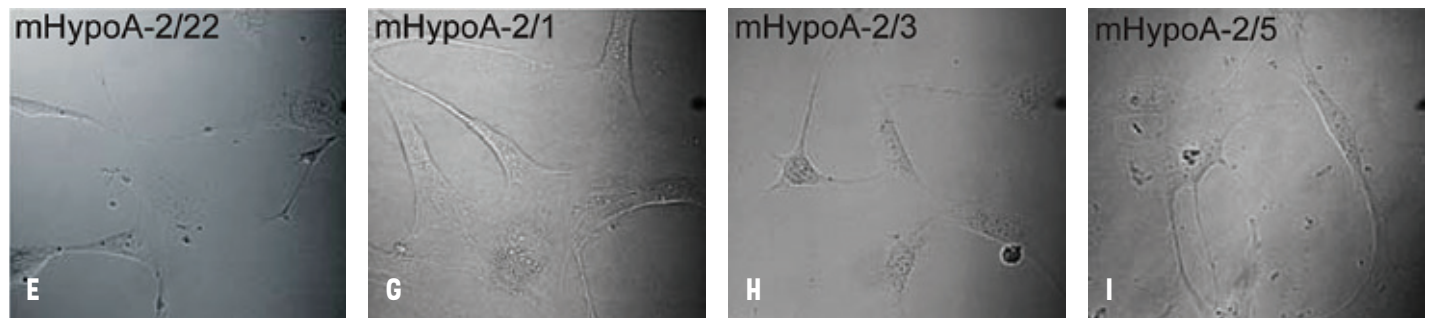
Based on a proprietary platform technology, these hypothalamic neuronal cell lines have been created by immortalizing hypothalamic primary cultures using retroviral transfer of SV40 T-Ag. These cell lines have been found to express an ever expanding array of neuropeptides, enzymatic markers, and biologically active receptors including: Neuropeptide Y, Oxytocin, POMC, Ghrelin, Metastatin/Kisspeptin, Arg Vasopressin, Leptin Receptor (ObRb), ghrelin receptor (GHS-R), Estrogen Alpha and Beta Receptors, Serotonin Receptor and Neurotensin.

As such, these cell lines enable accurate in-vitro assays for use in the discovery, development, and validation of new therapeutics targeted to central nervous system diseases and disorders, including obesity, stress, and metabolic disorders.

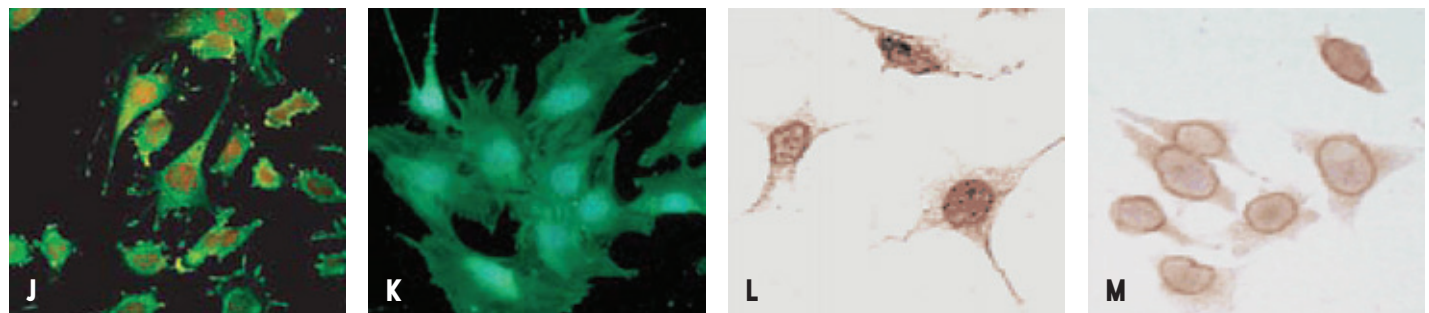
Images of embryonic and adult hypothalamus cell lines



A to D. The embryonic mHypoE-46, -29/2, -38 and -43/5 were imaged using phase contrast microscopy.



E to I. The adult mHypoA-2/22, -2/1, -2/3 and -2/5 were imaged using confocal differential interference contrast microscopy.



J. The embryonic mHypoE-38 neurons were imaged using fluorescent confocal microscopy after immunocytochemical analysis with anti-ghrelin serum (green); nuclei were counterstained with propidium iodide (red).

K. The adult mHypoA-2/12 neurons were imaged using fluorescent microscopy after immunocytochemical analysis with an antibody against NPY (green); nuclei were counterstained with DAPI (blue).

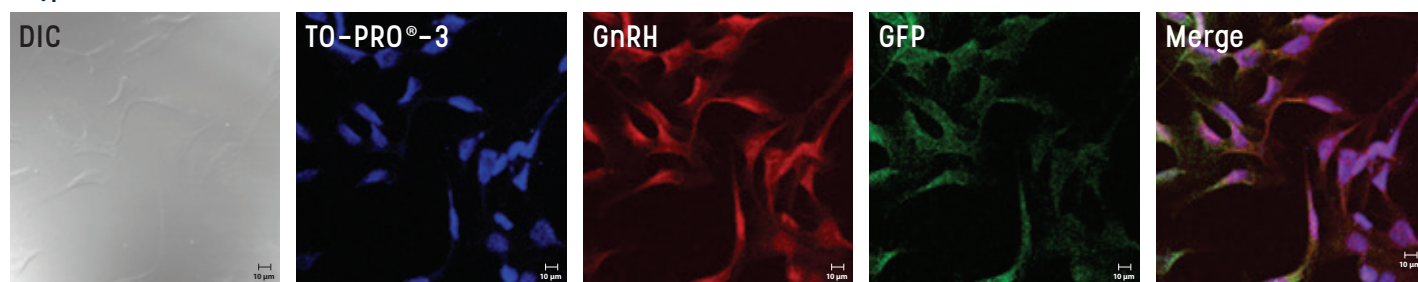
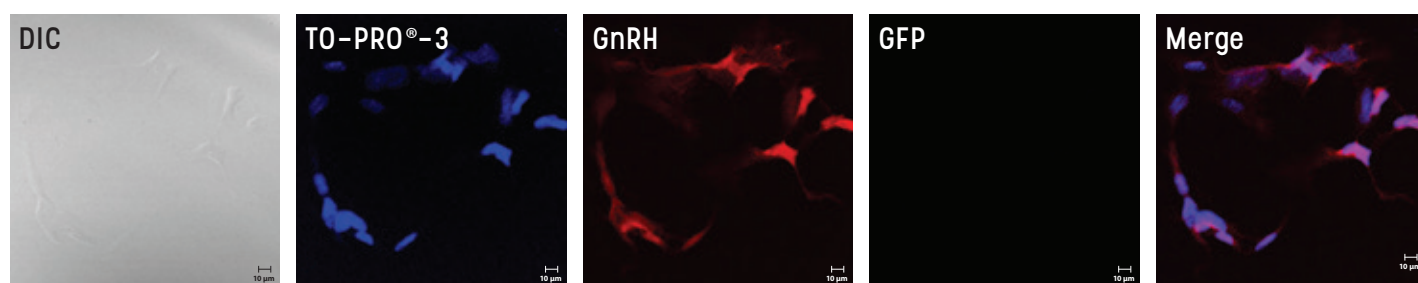
L and M. The mHypoE-36/1 neurons were imaged using DAB staining during immunocytochemical analysis with antibodies against neurofilament (NF) and neurotensin (NT) respectively.

Adult Mouse Suprachiasmatic Nucleus Cell Line (mHypoA-SCN mix)**Cat. # CLU497**

This product is based on a proprietary platform technology which has enabled the creation of a series of immortalized hypothalamic neurons. Primary neurons were microdissected from the suprachiasmatic nucleus (SCN) area of the hypothalamus from 6 adult female C57Bl/6 mice. Pooled primary cultures were immortalized by retroviral transfer of the SV40 T-Ag. No further subcloning of the immortalized cells was done.

Model GFP Cell Lines**Adult Mouse Hypothalamus GnRH/GFP Cell Line (mHypoA-GnRH/GFP)****Cat. # CLU498**

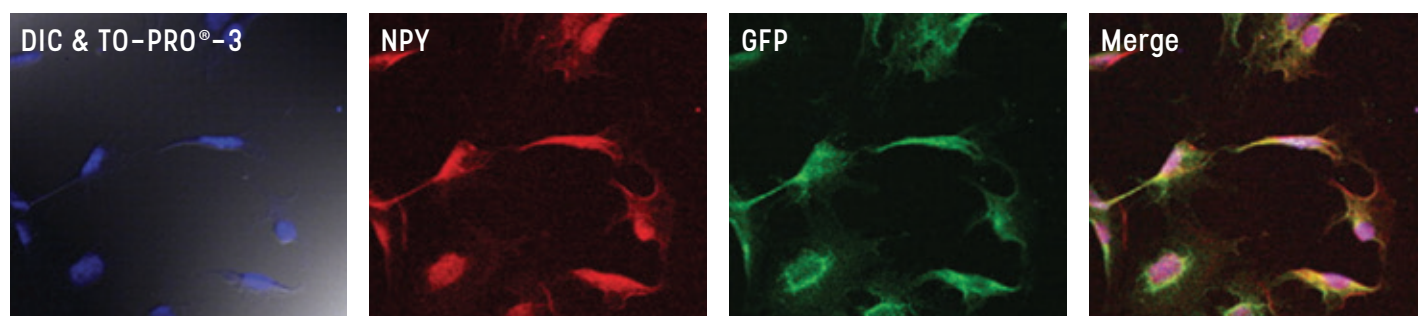
mHypoA-GnRH/GFP was generated using a proprietary platform technology enabling the creation of a pool of immortalized hypothalamic neurons. These neurons were immortalized from GnRH-GFP transgenic mice hypothalamic primary cultures by retroviral transfer of SV40 T-Ag. The immortalized hypothalamic cells were sorted on a cell sorting flow cytometer based on GFP fluorescence to greater than 95% purity. These cells represent the entire population of mHypoA-GnRH/GFP neurons and have not been further subcloned.

mHypoA-GnRH/GFP**GT1-7**

The immortalized mHypoA-GnRH/GFP line expresses GFP and GnRH, as determined by ICC. The levels of GnRH expression are comparable to the GT1-7 cell line. To-PRO-3 is a nuclear stain, whereas the differential interference contrast (DIC) image is also shown. (McFadden et al. (2013) *Mol Cell Endocrinol.* 377(1-2): 65-74.)

Adult Mouse Hypothalamus NPY/GFP Cell Line (mHypoA-NPY/GFP)**Cat. # CLU499**

mHypoA-NPY/GFP was generated using a proprietary platform technology enabling the creation of a pool of immortalized hypothalamic neurons. These neurons were immortalized from two month old NPY-GFP mice (strain B6.FVB-Tg(Npy-hrGFP)Low/J) hypothalamic primary cultures by retroviral transfer of SV40 T-Ag. These hemizygous mice express humanized Renilla Green Fluorescent Protein under control of the mouse neuropeptide Y (NPY) promoter. The immortalized hypothalamic cells were sorted on a cell sorting flow cytometer based on GFP fluorescence to greater than 95% purity. These cells represent the entire population of mHypoA-NPY/GFP neurons and have not been further subcloned.



The immortalized hypothalamic mHypoA-NPY/GFP line expresses GFP and NPY, as determined by ICC, confirming that the cultures only contain immortalized mHypoA-NPY/GFP neurons. DIC, Differential interference contrast; TO-PRO-3, nuclear stain. Merge, Nuclear Stain, NPY, and GFP Ab. (Dhillon et al. (2011) *Endocrinology.* 152(11): 4138-4147.)

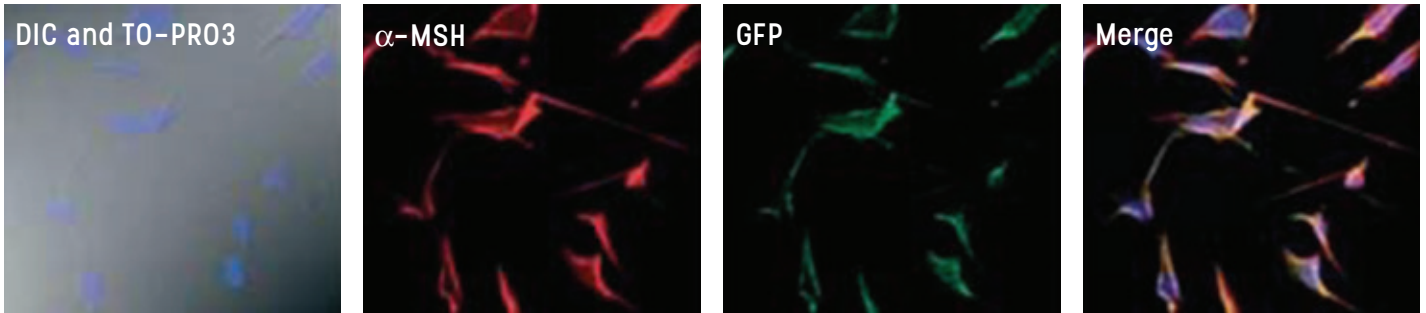
Model GFP Cell Lines

Adult Mouse Hypothalamus Cell Line mHypoA-POMC/GFP-1 - 4

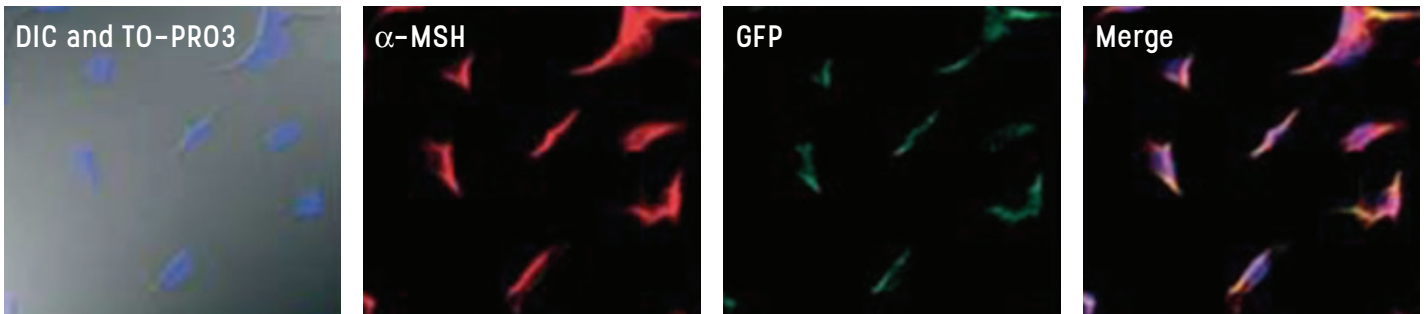
Cat. # CLU500 - CLU503

The mHypoA-POMC/GFP cell lines were generated using a proprietary platform technology enabling the creation of pools of immortalized hypothalamic neurons. These neurons were immortalized from four 8 week old male POMC-GFP mice (mouse 1-4) (strain C57BL/6J-Tg(Pomc-EGFP)^{1Low/J}) hypothalamic primary cultures by retroviral transfer of SV40 T-Ag. These mice contain an eGFP transgene driven by the POMC promoter. The four immortalized hypothalamic pools were sorted on a cell sorting flow cytometer based on GFP fluorescence. Four cell lines representing the heterogeneous population of hypothalamic POMC neurons resulted: mHypoA-POMC/GFP lines 1-4.

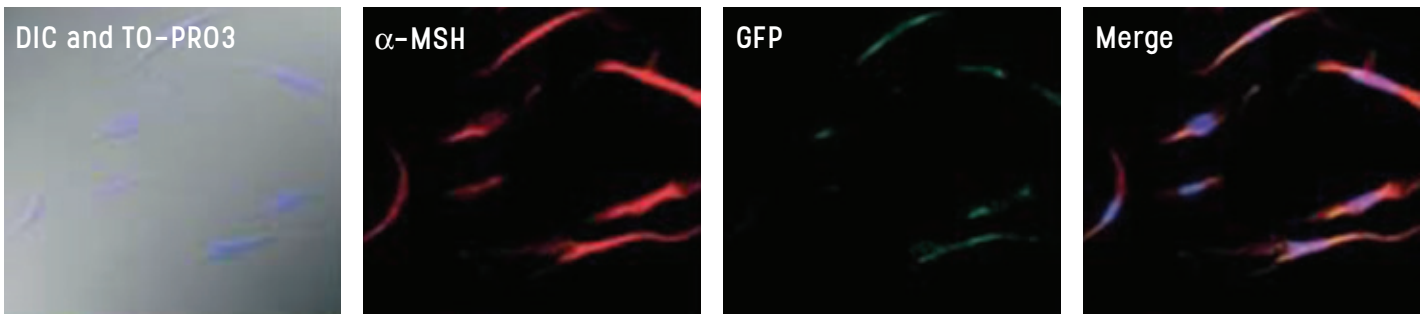
mHypoA-POMC/GFP-1



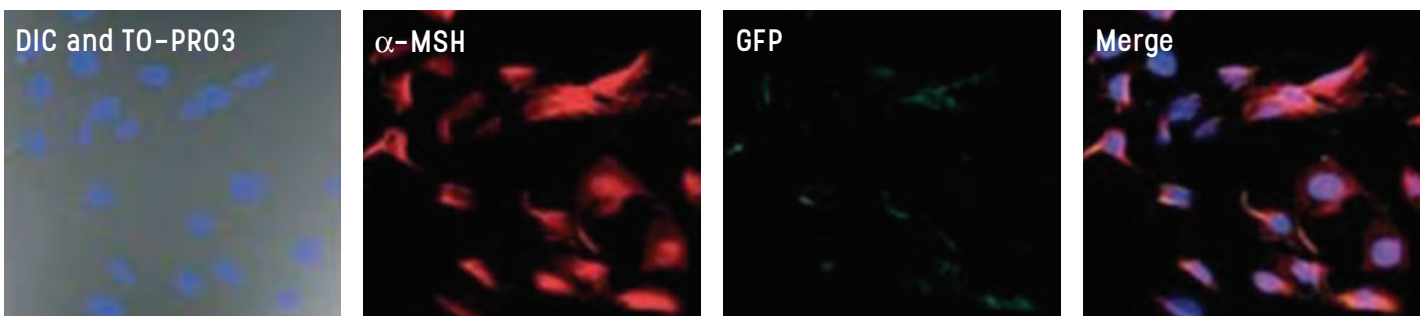
mHypoA-POMC/GFP-2



mHypoA-POMC/GFP-3



mHypoA-POMC/GFP-4



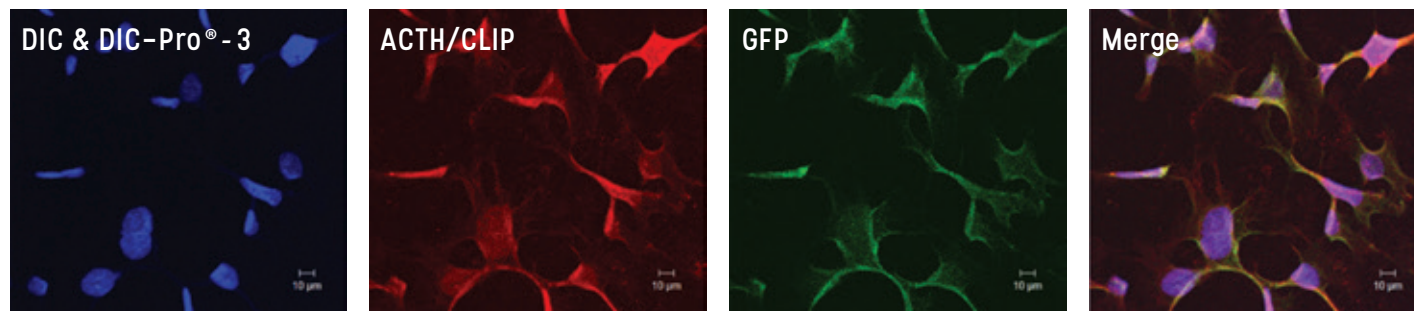
The mHypoA-POMC/GFP cell lines co-express α -MSH and GFP. ICC was performed on each cell line with antibodies specific to α -MSH (red) and GFP (green). The nucleic acid stain TO-PRO-3 was used to visualize cell nuclei (blue).
(Nazarians-Armavil, A. et al. (2014) *Journal of Endocrinology* 220(1): 13-24.)

Model GFP Cell Lines

Adult Mouse Pituitary Cell Line mPitA-POMC/GFP-1

Cat. # CLU504

mPitA-POMC/GFP-1 was generated from a pool of immortalized pituitary neurons. These neurons were immortalized from an 8 week old male POMC-GFP mouse (mouse 1) (strain C57BL/6J-Tg(Pomc-EGFP)^{1Low/J}) pituitary primary culture by retroviral transfer of SV40 T-Ag. The immortalized pituitary pool was sorted on a cell sorting flow cytometer based on GFP fluorescence. A cell line representing the heterogeneous population of POMC-expressing pituitary neurons resulted: mPitA-POMC/GFP-1.



The mPitA-POMC/GFP-1 cell line co-express ACTH/CLIP and GFP. ICC was performed on the cell line with antibodies specific to ACTH/CLIP (red) and GFP (green). The nucleic acid stain TO-PRO-3 was used to visualize cell nuclei (blue).

Adult Mouse Hypothalamus Cell Line mHypoA-Kiss/GFP-1 - 2 (male)

Cat. # CLU505 - CLU506

Adult Mouse Hypothalamus Cell Line mHypoA-Kiss/GFP-3 (female; ARC nuclei derived)

Cat. # CLU507

Adult Mouse Hypothalamus Cell Line mHypoA-Kiss/GFP-4 (female; AVPV nuclei derived)

Cat. # CLU508

The mHypoA-Kiss/GFP cell lines were generated using a proprietary platform technology enabling the creation of pools of immortalized hypothalamic neurons. Kiss/GFP transgenic mouse (Kiss-1^{tm1.1(cre/EGFP)Ste1/J}; strain (129S6/SvEvTac x C57BL/6Ncr)F1) hypothalami were microdissected from 2 month old female or male mice, isolating the ARC and AVPV nuclei individually for the female mice or using the entire hypothalamus for the male mice. These mice contain an eGFP transgene driven by the Kiss-1 promoter. These hypothalamic primary cultures were immortalized by retroviral transfer of the SV40 T-Ag. The four immortalized hypothalamic pools were sorted on a cell sorting flow cytometer based on GFP fluorescence. These cells represent the entire population of mHypoA-Kiss/GFP neurons from the ARC (mHypoA-Kiss/GFP-3) and AVPV (mHypoA-Kiss/GFP-4) for the female, and all Kiss neurons for the male (mHypoA-Kiss/GFP-1-2), and have not been further subcloned.

Hippocampal Cell Lines

Embryonic Mouse Hippocampal cells

4 cell lines designated mHippoE-xx

Cat. # CLU196 - CLU199

This line of embryonic mouse hippocampal cell lines is based on a proprietary platform technology which has enabled the creation of 4 phenotypically distinct immortalized cell lines, derived from male and female Swiss Webster mouse hippocampal primary cultures by retroviral transfer of SV40 T-Ag. The Hippocampal cell lines are easy to culture, have efficient transfection rates, and have robust gene and protein expression.

Pituitary Cell Lines

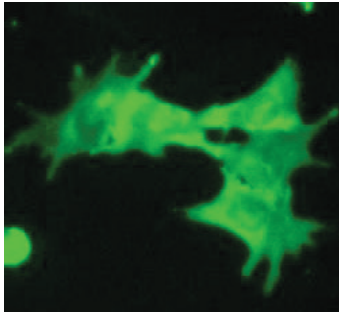
Adult Mouse Pituitary cells

24 cell lines designated mPitA-xx

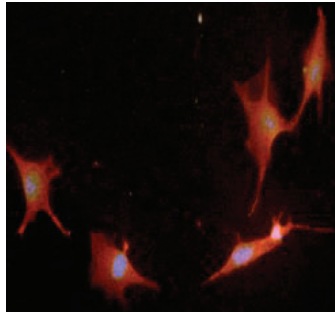
Cat # CLU402-CLU425

This line of adult mouse pituitary cell lines is based on a proprietary platform technology which has enabled the creation of 19 mixed cell cultures that contain cells from particular pituitary cell lineages, as determined by RT-PCR analysis and immunocytochemistry for specific hormones. Pituitary cell cultures have been immortalized from fully differentiated adult mouse pituitary cell culture (C57Bl/6; female) by retroviral transfer of SV40 T-Ag.

The pituitary cell lines are easy to culture, and have robust gene and protein expression. As such, these adult-derived pituitary cell lines enable accurate assays for use in studies of progenitor cell characteristics and modulation, and the molecular analysis of hormone synthesis and secretion in differentiated cell lines.



mPitA-14 cell line
– Prolactin (PRL)



mPitA-15 cell line
– Oxytocin (OXT)

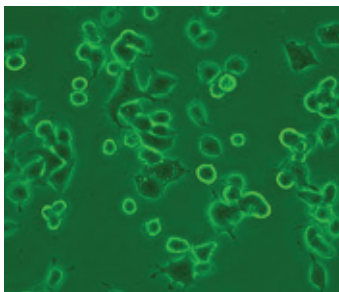
Mouse Motor Neuron-Like Cell Line

NSC-34

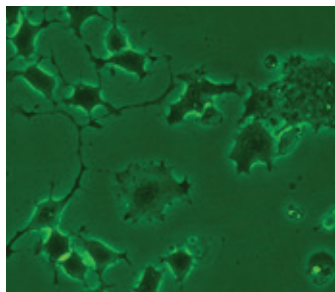
Cat. # CLU140

NSC-34 is a hybrid cell line, produced by fusion of motor neuron enriched, embryonic mouse spinal cord cells with mouse neuroblastoma. Cultures contain two populations of cells: small, undifferentiated cells that have the capacity to undergo cell division, and larger multinucleate cells. These cells express many properties of motor neurons, including choline acetyltransferase, acetylcholine synthesis, storage and release, and neurofilament triplet proteins.

Applications: NSC-34 cells have been evaluated following exposure of cultures to a selection of chemicals known to be neurotoxic to motor neurons. NSC-34 cells respond to agents that affect voltage-gated ion channels, cytoskeletal organization, and axonal transport. The sensitivity of action potential production to various ion channel blockers is similar to that in primary motor neurons in culture. Therefore, these immortalized motor neuron-like cells have utility as a model for the investigation of neurotoxicity.



A. NSC-34
NSC-34 contains small cells derived from mouse motor neurons, and larger multinucleated cells derived from mouse neuroblastoma cells.



Differentiated NSC-34
Small cells with extended neuronal processes

Human Oligodendrocytic Cell Line

M03.13

Cat. # CLU301

M03.13 is an immortal human-human hybrid cell line that expresses phenotypic characteristics of primary oligodendrocytes. It was created by fusing a 6-thioguanine-resistant mutant of the human rhabdomyosarcoma RD (cancer of skeletal muscle) with adult human oligodendrocytes by a lectin-enhanced polyethylene glycol procedure. In contrast to the tumor parent, M03.13 expresses surface immunoreactivity for galactosyl cerebroside (GS) and intracellular immunoreactivity for myelin basic protein (MBP), proteolipid protein (PLP), and glial fibrillary acidic protein (GFAP).

M03.13 was shown to express markers of immature oligodendrocytes, GalC (galactosylceramidase) and CNPase. Upon differentiation, the line has also been shown to express the mature oligodendrocytic markers MBP and MOG (myelin oligodendrocyte glycoprotein).

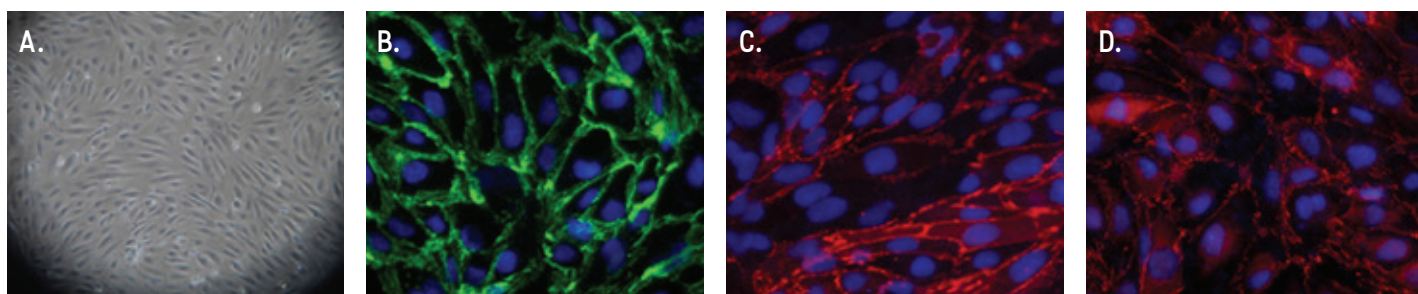
Human Cerebral Microvascular Endothelial Cell Line

hCMEC/D3

Cat. # CLU512

The Human Cerebral Microvascular Endothelial Cell Line (hCMEC/D3) was prepared from cerebral microvascular endothelial cells (CECs) by transduction with lentiviral vectors carrying the SV40 T antigen, and human telomerase reverse transcriptase (hTERT). This cell line shows a spindle-shaped, elongated morphology, similar to primary cultures of brain endothelial cells, and also exhibits contact inhibition at confluence when cultured on collagen type I or IV. In addition, this line expresses a variety of brain endothelial markers, adherence junction (AJ) and tight junction (TJ) proteins, as well as functional ABC transporters typical of brain epithelium.

hCMEC/D3 represents a stable, easily grown blood brain barrier (BBB) model cell line. It is ideal for drug uptake and active transport studies, as well as for research into the response of the brain endothelium to various human pathogens and inflammatory stimuli.



Expression of endothelial and BBB markers by hCMEC/D3 cells. Phase-contrast image of confluent hCMEC/D3 cells (A). Confluent monolayers of hCMEC/D3 cells were stained for the endothelial junctional marker VE-Cadherin (B) and for the junction associated proteins Claudin-5 (C) and ZO-1 (D). In images B-D, nuclei were counterstained blue.

For more information, please contact:



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FEATURED NEUROSCIENCE ANTIBODIES

Legend for Applications:

- C** = Cryostat Sections
- E** = ELISA
- IHC** = Immunohistochemistry
- P** = Paraffin-Embedded Sections
- WB** = Western Blotting

Specificity	Format	Clone	Isotype	Species Reactivity	Applications	Size	Cat. #
5HT2C receptor	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	P	100 µg	CL8845AP
Adrenocorticotrophic hormone (ACTH) (1-24)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB	100 µg	CL8858AP
Adiponectin	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E, P	100 µg	CL8875AP
Corticotropin-releasing hormone (CRH)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB	100 µg	CL8859AP
Estrogen Receptor alpha (ESR1)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB, P	100 µg	CL7662AP
Gad67	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB, P	100 µg	CL8856AP
Galanin	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E	100 µg	CL8866AP
Ghrelin	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB, P	100 µg	CL8818AP
Growth hormone secretagogue receptor type 1 (GHSR-1)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB	100 µg	CL8826AP
Glucagon like peptide 1 receptor (GLP1R)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse	WB	100 µg	CL8822AP
Glucagon like peptide 1 receptor (GLP2R)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse	E, WB	100 µg	CL8823AP
Glucagon like peptide 1 (GLP1)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB	100 µg	CL8873AP
Glucagon like peptide 2 (GLP2)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB, P	100 µg	CL8874AP
Glucocorticoid Receptor (GR)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	WB, E, P	100 µg	CL7660AP
Glucokinase (GK)	Affinity Purified	Polyclonal	Rabbit IgG	Human	E, WB	100 µg	CL8880AP
Glucagon	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E	100 µg	CL8867AP
Glucagon receptor	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB	100 µg	CL8893AP
Glucose transporter 1 (GLUT1)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E, WB	100 µg	CL8885AP
Glucose transporter 2 (GLUT2)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Human	E, WB	100 µg	CL8886AP
Glucose transporter 3 (GLUT3)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse	E, WB	100 µg	CL8887AP
Glucose transporter 4 (GLUT4)	Affinity Purified	Polyclonal	Rabbit IgG	Rat, Human	E, WB	100 µg	CL8889AP
Glucose transporter 5 (GLUT5)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E, WB	100 µg	CL8890AP
Gonadotropin-releasing hormone (GnRH)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E	100 µg	CL8862AP
GPR39	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB	100 µg	CL8853AP
GPR45	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	P	100 µg	CL8852AP
Growth-hormone-releasing hormone (GHRH)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse	E, WB	100 µg	CL8860AP
	Affinity Purified	Polyclonal	Rabbit IgG	Human	E	100 µg	CL8861AP
Insulin receptor (IR)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse	E, P	100 µg	CL8837AP
Melanocortin receptor 3 (MC3R)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E, WB, P	100 µg	CL8835AP
Melanocortin receptor 4 (MC4R)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB, P	100 µg	CL8836AP
Neuron Specific Enolase (NSE)	Purified	NSE-P1	Mouse IgG1, k	Mouse, Rat, Human	WB, E, IHC	200 µg	CL2721AP
	Purified	NSE-P2	Mouse IgG1, k	Rat, Human	WB, E, IHC	200 µg	CL2722AP
Neuropeptide Y (NPY)	Affinity Purified	Polyclonal	Goat IgG	Mouse, Human	E	200 µg	CL8819AP
	Biotin	Polyclonal	Goat IgG	Mouse, Human	E	100 µg	CL8819B
Neuropeptide Y receptor 1 (NPY1R)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB	100 µg	CL8839AP
Neuropeptide Y receptor 2 (NPY2R)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB, P	100 µg	CL8840AP
Neuropeptide Y receptor 4 (NPY4R)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E, WB, P	100 µg	CL8841AP
Neurotensin	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E	100 µg	CL8871AP
Neurotensin receptor type 1 (NTSR1)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E, WB	100 µg	CL8833AP
Neurotensin receptor type 2 (NTSR2)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E, WB	100 µg	CL8834AP
PGP 9.5 (UCHL1)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	WB, E, P	100 µg	CL7755AP
	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	WB, E, P	20 µg	CL7755AP-S
	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	WB, E, P, C	100 µg	CL7756AP
	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	WB, E, P, C	50 µg	CL7756AP-50
	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	WB, E, P, C	20 µg	CL7756AP-S
	Affinity Purified	Polyclonal	Mouse IgG	Mouse, Rat, Human	E, WB	50 µg	CL7856AP
	Affinity Purified	Polyclonal	Mouse IgG	Mouse, Rat, Human	E, WB	15 µg	CL7856AP-S
Postsynaptic Density Protein 95 (PSD-95)	Affinity Purified	Polyclonal	Rabbit IgG	Human	E, WB	100 µg	CL7638AP
Progesterone receptor (PR)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E, WB, P	100 µg	CL8832AP
Prolactin Receptor (PRLR)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E, WB, P	100 µg	CL093AP
Secretin	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E	100 µg	CL8897AP
Tryptophan hydroxylase 1 (TPH1)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB	100 µg	CL8877AP
Tryptophan hydroxylase 2 (TPH2)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat	E, WB	100 µg	CL8878AP
Tyrosine hydroxylase (TH)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse, Rat, Human	E, WB	100 µg	CL8876AP
Vesicular glutamate transporter 1 (VGLUT1)	Affinity Purified	Polyclonal	Rabbit IgG	Human	E, WB	100 µg	CL8882AP
Vesicular glutamate transporter 3 (VGLUT3)	Affinity Purified	Polyclonal	Rabbit IgG	Mouse	E, WB	100 µg	CL8884AP