

RT² Profiler PCR Array (Rotor-Gene® Format)

Rat GABA & Glutamate

Cat. no. 330231 PARN-152ZR

For pathway expression analysis

Format	For use with the following real-time cyclers
RT ² Profiler PCR Array, Format R	Rotor-Gene Q, other Rotor-Gene cyclers

Description

The Rat GABA & Glutamate RT² Profiler PCR Array profiles the expression of 84 key genes of the GABA (γ-aminobutyric acid) and glutamate neurotransmitter systems. The brain is a complex organ, capable of exerting essential responses for a variety of internal and external stimuli. Each stimulus activates excitatory or inhibitory responses, and the sum of these responses on each neuron results in propagated or inhibited neuronal transmission. Of the wide variety of neuronal receptors in the brain, the major excitatory receptors recognize the ligand glutamate, and the major inhibitory receptors respond to the ligand GABA. The GABA neurotransmitter system includes the GABAA and GABAC classes of ligand gated ion channels. The glutamate neurotransmitter system includes NMDA, AMPA, and kainate ligand-gated ion channels. Key enzymes synthesize GABA or glutamate as necessary, which are then transported into synaptic vesicles. Release of GABA or glutamate from vesicles activates postsynaptic GABA-responsive or glutamate-responsive ion channels, respectively, initiating downstream G protein signaling to propagate neurotransmission. Dysregulation of GABAergic or glutamatergic synaptic transmission results in a wide variety of nervous system disorders, including chronic pain, psychiatric diseases, neurodegenerative diseases, and insomnia. There are many drugs that are agonists or antagonists of the GABA and glutamate neurotransmitter systems. Historically, these major excitatory and inhibitory systems were studied separately. However, recent research suggests that input from both GABA and glutamate are necessary for normal nervous system growth and function. This array represents genes essential for the synthesis and transport of GABA and glutamate, as well as responsive ion channels and downstream signaling. The results of this array may yield insights into the interaction of these excitatory and inhibitory neuronal systems during essential cognitive functions. Using real-time PCR, research studies can easily and reliably analyze the expression of a focused

panel of genes involved in neuronal GABA and glutamate functions with this array.

For further details, consult the *RT² Profiler PCR Array Handbook*.

Shipping and storage

RT² Profiler PCR Arrays in the Rotor-Gene format are shipped at ambient temperature, on dry ice, or blue ice packs depending on destination and accompanying products.

For long term storage, keep plates at –20°C.

Note: Ensure that you have the correct RT² Profiler PCR Array format for your real-time cycler (see table above).

Note: Open the package and store the products appropriately immediately on receipt.



Array layout

The 96 real-time assays in the Rotor-Gene format are located in wells 1–96 of the Rotor-Disc™ (plate A1–A12=Rotor-Disc 1–12, plate B1–B12=Rotor-Disc 13–24, etc.). To maintain data analysis compatibility, wells 97–100 do not contain real-time assays but will contain master mix to account for weight balance.

Gene table: RT² Profiler PCR Array

Position	UniGene	GenBank	Symbol	Description
A01	Rn.10090	NM_031003	Abat	4-aminobutyrate aminotransferase
A02	Rn.161712	NM_053396	Adcy7	Adenylate cyclase 7
A03	Rn.32078	NM_017155	Adora1	Adenosine A1 receptor
A04	Rn.11180	NM_053294	Adora2a	Adenosine A2a receptor
A05	Rn.10070	XM_214478	Aldh5a1	Aldehyde dehydrogenase 5 family, member A1
A06	Rn.2104	NM_019288	App	Amyloid beta (A4) precursor protein
A07	Rn.9976	NM_016992	Avp	Arginine vasopressin
A08	Rn.11266	NM_012513	Bdnf	Brain-derived neurotrophic factor
A09	Rn.87769	NM_012918	Cacna1a	Calcium channel, voltage-dependent, P/Q type, alpha 1A subunit
A10	Rn.85880	NM_147141	Cacna1b	Calcium channel, voltage-dependent, N type, alpha 1B subunit
A11	Rn.11213	NM_053891	Cdk5r1	Cyclin-dependent kinase 5, regulatory subunit 1
A12	Rn.102386	NM_001006971	Cln3	Ceroid-lipofuscinosis, neuronal 3
B01	Rn.9765	NM_019621	Dlg4	Discs, large homolog 4 (Drosophila)
B02	Rn.30059	NM_031028	Gabbr1	Gamma-aminobutyric acid (GABA) B receptor 1
B03	Rn.162814	NM_031802	Gabbr2	Gamma-aminobutyric acid (GABA) B receptor 2
B04	Rn.28463	NM_183326	Gabra1	Gamma-aminobutyric acid (GABA) A receptor, alpha 1
B05	Rn.48180	NM_001135779	Gabra2	Gamma-aminobutyric acid (GABA-A) receptor, subunit alpha 2
B06	Rn.81205	NM_080587	Gabra4	Gamma-aminobutyric acid (GABA) A receptor, alpha 4
B07	Rn.10368	NM_017295	Gabra5	Gamma-aminobutyric acid (GABA) A receptor, alpha 5
B08	Rn.211981	NM_021841	Gabra6	Gamma-aminobutyric acid (GABA) A receptor, alpha 6
B09	Rn.207157	NM_012956	Gabbr1	Gamma-aminobutyric acid (GABA) A receptor, beta 1
B10	Rn.208980	NM_017065	Gabbr3	Gamma-aminobutyric acid (GABA) A receptor, beta 3
B11	Rn.10927	NM_017289	Gabrd	Gamma-aminobutyric acid (GABA) A receptor, delta
B12	Rn.54455	NM_023091	Gabre	Gamma-aminobutyric acid (GABA) A receptor, epsilon
C01	Rn.10366	NM_080586	Gabrg1	Gamma-aminobutyric acid (GABA) A receptor, gamma 1
C02	Rn.159942	NM_183327	Gabrg2	Gamma-aminobutyric acid (GABA) A receptor, gamma 2
C03	Rn.10369	NM_024370	Gabrg3	Gamma-aminobutyric acid (GABA) A receptor, gamma 3
C04	Rn.81067	NM_031733	Gabrq	Gamma-aminobutyric acid (GABA) receptor, theta
C05	Rn.33552	NM_017291	Gabbr1	Gamma-aminobutyric acid (GABA) receptor, rho 1
C06	Rn.48659	NM_017292	Gabbr2	Gamma-aminobutyric acid (GABA) receptor, rho 2
C07	Rn.91245	NM_017007	Gad1	Glutamate decarboxylase 1
C08	Rn.5762	NM_012569	Gls	Glutaminase
C09	Rn.2204	NM_017073	Glul	Glutamate-ammonia ligase (glutamine synthetase)
C10	Rn.11391	NM_013145	Gnai1	Guanine nucleotide binding protein (G protein), alpha inhibiting 1
C11	Rn.22817	NM_031036	Gnaq	Guanine nucleotide binding protein (G protein), q polypeptide
C12	Rn.11032	NM_022865	Gphn	Gephyrin
D01	Rn.29971	NM_031608	Gria1	Glutamate receptor, ionotropic, AMPA 1
D02	Rn.91361	NM_017261	Gria2	Glutamate receptor, ionotropic, AMPA 2
D03	Rn.74049	NM_032990	Gria3	Glutamate receptor, ionotropic, AMPA 3
D04	Rn.10938	NM_017263	Gria4	Glutamate receptor, ionotropic, AMPA 4
D05	Rn.10449	NM_017241	Grik1	Glutamate receptor, ionotropic, kainate 1
D06	Rn.87696	NM_019309	Grik2	Glutamate receptor, ionotropic, kainate 2
D07	Rn.10049	NM_012572	Grik4	Glutamate receptor, ionotropic, kainate 4
D08	Rn.74042	NM_031508	Grik5	Glutamate receptor, ionotropic, kainate 5
D09	Rn.9840	NM_017010	Grin1	Glutamate receptor, ionotropic, N-methyl D-aspartate 1
D10	Rn.9710	NM_012573	Grin2a	Glutamate receptor, ionotropic, N-methyl D-aspartate 2A
D11	Rn.9711	NM_012574	Grin2b	Glutamate receptor, ionotropic, N-methyl D-aspartate 2B
D12	Rn.9709	NM_012575	Grin2c	Glutamate receptor, ionotropic, N-methyl D-aspartate 2C
E01	Rn.87787	NM_017011	Grm1	Glutamate receptor, metabotropic 1
E02	Rn.9681	NM_001105711	Grm2	Glutamate receptor, metabotropic 2
E03	Rn.41715	NM_001105712	Grm3	Glutamate receptor, metabotropic 3
E04	Rn.89046	NM_022666	Grm4	Glutamate receptor, metabotropic 4
E05	Rn.29972	NM_017012	Grm5	Glutamate receptor, metabotropic 5
E06	Rn.44615	NM_022920	Grm6	Glutamate receptor, metabotropic 6
E07	Rn.10409	NM_031040	Grm7	Glutamate receptor, metabotropic 7
E08	Rn.44420	NM_022202	Grm8	Glutamate receptor, metabotropic 8
E09	Rn.37500	NM_031707	Homer1	Homer homolog 1 (Drosophila)

Position	UniGene	GenBank	Symbol	Description
E10	Rn.30014	NM_053309	Homer2	Homer homolog 2 (Drosophila)
E11	Rn.9869	NM_031512	Il1b	Interleukin 1 beta
E12	Rn.2135	NM_001007235	Itpr1	Inositol 1,4,5-triphosphate receptor, type 1
F01	Rn.34914	NM_053842	Mapk1	Mitogen activated protein kinase 1
F02	Rn.13345	NM_021748	Nsf	N-ethylmaleimide-sensitive factor
F03	Rn.10510	NM_019256	P2rx7	Purinergic receptor P2X, ligand-gated ion channel, 7
F04	Rn.6872	NM_031620	Phgdh	Phosphoglycerate dehydrogenase
F05	Rn.44692	NM_001005560	Pla2g6	Phospholipase A2, group VI (cytosolic, calcium-independent)
F06	Rn.45523	NM_001077641	Plcb1	Phospholipase C, beta 1 (phosphoinositide-specific)
F07	Rn.153570	NM_001135778	Prodh	Proline dehydrogenase
F08	Rn.14545	NM_133440	Shank2	SH3 and multiple ankyrin repeat domains 2
F09	Rn.19372	NM_053427	Slc17a6	Solute carrier family 17 (sodium-dependent inorganic phosphate cotransporter), member 6
F10	Rn.10267	NM_053859	Slc17a7	Solute carrier family 17 (sodium-dependent inorganic phosphate cotransporter), member 7
F11	Rn.84876	NM_153725	Slc17a8	Solute carrier family 17 (sodium-dependent inorganic phosphate cotransporter), member 8
F12	Rn.6384	NM_013032	Slc1a1	Solute carrier family 1 (neuronal/epithelial high affinity glutamate transporter, system Xag), member 1
G01	Rn.10240	NM_017215	Slc1a2	Solute carrier family 1 (glial high affinity glutamate transporter), member 2
G02	Rn.34134	NM_019225	Slc1a3	Solute carrier family 1 (glial high affinity glutamate transporter), member 3
G03	Rn.10827	NM_032065	Slc1a6	Solute carrier family 1 (high affinity aspartate/glutamate transporter), member 6
G04	Rn.72404	NM_001108973	Slc1a7	Solute carrier family 1 (glutamate transporter), member 7
G05	Rn.10846	NM_031782	Slc32a1	Solute carrier family 32 (GABA vesicular transporter), member 1
G06	Rn.162022	NM_138832	Slc38a1	Solute carrier family 38, member 1
G07	Rn.10035	NM_024371	Slc6a1	Solute carrier family 6 (neurotransmitter transporter, GABA), member 1
G08	Rn.10545	NM_024372	Slc6a11	Solute carrier family 6 (neurotransmitter transporter, GABA), member 11
G09	Rn.11352	NM_017335	Slc6a12	Solute carrier family 6 (neurotransmitter transporter, betaine/GABA), member 12
G10	Rn.10527	NM_133623	Slc6a13	Solute carrier family 6 (neurotransmitter transporter, GABA), member 13
G11	Rn.1827	NM_019169	Snca	Synuclein, alpha (non A4 component of amyloid precursor)
G12	Rn.220332	NM_198757	Srr	Serine racemase
H01	Rn.94978	NM_031144	Actb	Actin, beta
H02	Rn.1868	NM_012512	B2m	Beta-2 microglobulin
H03	Rn.47	NM_012583	Hprt1	Hypoxanthine phosphoribosyltransferase 1
H04	Rn.107896	NM_017025	Ldha	Lactate dehydrogenase A
H05	Rn.973	NM_001007604	Rplp1	Ribosomal protein, large, P1
H06	N/A	U26919	RGDC	Rat Genomic DNA Contamination
H07	N/A	SA_00104	RTC	Reverse Transcription Control
H08	N/A	SA_00104	RTC	Reverse Transcription Control
H09	N/A	SA_00104	RTC	Reverse Transcription Control
H10	N/A	SA_00103	PPC	Positive PCR Control
H11	N/A	SA_00103	PPC	Positive PCR Control
H12	N/A	SA_00103	PPC	Positive PCR Control

Related products

For optimal performance, RT² Profiler PCR Arrays should be used together with the RT² First Strand Kit for cDNA synthesis and RT² SYBR[®] Green qPCR Mastermixes for PCR.

Product	Contents	Cat. no.
RT ² First Strand Kit (12)	Enzymes and reagents for cDNA synthesis	330401
RT ² SYBR Green ROX™ FAST Mastermix (2)*	For 2 x 96 assays in 96-well plates; suitable for use with the Rotor-Gene Q and other Rotor-Gene cyclers	330620

* Larger kit sizes available; please inquire.

RT² Profiler PCR Array products are intended for molecular biology applications. These products are not intended for the diagnosis, prevention, or treatment of a disease.

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