

RT² Profiler PCR Array (Rotor-Gene[®] Format)

Rat Osteoporosis

Cat. no. 330231 PARN-170ZR

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 Osteoporosis RT² Profiler PCR Array profiles the expression of 84 genes involved in pathogenesis of osteoporosis (OP). Advanced age, gender, and immobilization are major risk factors for developing OP, and additional contributing factors include diminished sex steroid production in post-menopausal women. OP is a metabolic disorder of the bones characterized by low bone mineral density (BMD) and increased incidence of fractures due to disruption of bone remodeling — the balance between bone resorption and bone formation. Bone remodeling is conducted by osteoclasts (cells responsible for bone resorption) and by osteoblasts (cells responsible for bone formation). Osteoblasts have a central role in bone metabolism and are responsible for bone matrix synthesis and mineralization, synthesis of growth factors and hormones, and regulation of osteoclastogenesis for bone resorption. In OP, a pathological imbalance in the bone remodeling process is typically linked to a disrupted RANKL/OPG signaling equilibrium wherein elevated RANKL levels favor resorption through osteoclast formation, function, and survival with lowered BMD. Recent evidence also suggests that inflammation plays a significant role in disrupting osteoclast–osteoblast equilibrium, which affects BMD. Enormous research efforts are underway to determine the molecular mechanisms of pathogenesis of OP with the aim of obtaining novel targets for its treatment and prevention as well as the identification of early diagnostic markers. The genes profiled with this array are associated with osteoblast and osteoclast activity including WNT and BMP signaling pathways, ECM and bone matrix remodeling, and cytokines and growth factors currently associated with OP molecular pathogenesis. A set of controls present on each array enables data analysis using the $\Delta\Delta\text{CT}$ method of relative quantification and assessment of reverse transcription performance, genomic DNA contamination, and PCR performance. Using real-time PCR, research studies can easily and reliably analyze the expression of a

focused panel of genes involved in osteoporosis 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.171928	NM_019144	Acp5	Acid phosphatase 5, tartrate resistant
A02	Rn.42892	NM_021684	Adcy10	Adenylate cyclase 10 (soluble)
A03	Rn.66513	NM_001105798	Alox12	Arachidonate 12-lipoxygenase
A04	Rn.11318	NM_031010	Alox15	Arachidonate 15-lipoxygenase
A05	Rn.9662	NM_012822	Alox5	Arachidonate 5-lipoxygenase
A06	Rn.82764	NM_013059	Alpl	Alkaline phosphatase, liver/bone/kidney
A07	Rn.9813	NM_012502	Ar	Androgen receptor
A08	Rn.9722	NM_013414	Bglap	Bone gamma-carboxyglutamate (gla) protein
A09	Rn.90931	NM_017178	Bmp2	Bone morphogenetic protein 2
A10	Rn.18030	XM_342591	Bmp7	Bone morphogenetic protein 7
A11	Rn.90085	NM_017338	Calca	Calcitonin-related polypeptide alpha
A12	Rn.10062	NM_053816	Calcr	Calcitonin receptor
B01	Rn.26083	NM_019291	Car2	Carbonic anhydrase II
B02	Rn.10019	NM_016996	Casr	Calcium-sensing receptor
B03	Rn.25180	NM_134360	Cd40	CD40 molecule, TNF receptor superfamily member 5
B04	Rn.10338	NM_031568	Clcn7	Chloride channel 7
B05	Rn.48776	NM_020543	Cnr2	Cannabinoid receptor 2 (macrophage)
B06	Rn.2953	NM_053304	Col1a1	Collagen, type I, alpha 1
B07	Rn.107239	NM_053356	Col1a2	Collagen, type I, alpha 2
B08	Rn.220	NM_012531	Comt	Catechol-O-methyltransferase
B09	Rn.98162	NM_001108785	Crtap	Cartilage associated protein
B10	Rn.5598	NM_031560	Ctsk	Cathepsin K
B11	Rn.10172	NM_012753	Cyp17a1	Cytochrome P450, family 17, subfamily a, polypeptide 1
B12	Rn.21402	NM_017085	Cyp19a1	Cytochrome P450, family 19, subfamily a, polypeptide 1
C01	Rn.11274	NM_012543	Dbp	D site of albumin promoter (albumin D-box) binding protein
C02	Rn.214343	NM_001106350	Dkk1	Dickkopf homolog 1 (Xenopus laevis)
C03	Rn.1199	NM_053535	Enpp1	Ectonucleotide pyrophosphatase/phosphodiesterase 1
C04	Rn.10595	NM_012689	Esr1	Estrogen receptor 1
C05	Rn.37460	NM_012754	Esr2	Estrogen receptor 2 (ER beta)
C06	Rn.130171	NM_001008511	Esrra	Estrogen related receptor, alpha
C07	Rn.9797	NM_024146	Fgfr1	Fibroblast growth factor receptor 1
C08	Rn.12732	NM_001109892	Fgfr2	Fibroblast growth factor receptor 2
C09	Rn.10693	NM_031577	Ghrh	Growth hormone releasing hormone
C10	Rn.888	NM_017080	Hsd11b1	Hydroxysteroid 11-beta dehydrogenase 1
C11	Rn.6282	NM_178866	Igf1	Insulin-like growth factor 1
C12	Rn.6813	NM_013122	Igfbp2	Insulin-like growth factor binding protein 2
D01	Rn.2490	NM_013129	Il15	Interleukin 15
D02	Rn.9873	NM_012589	Il6	Interleukin 6
D03	Rn.1716	NM_017020	Il6r	Interleukin 6 receptor
D04	Rn.91044	NM_030994	Itga1	Integrin, alpha 1
D05	Rn.162202	NM_153720	Itgb3	Integrin, beta 3
D06	Rn.44444	NM_013076	Lep	Leptin
D07	Rn.13741	NM_053667	Lepre1	Leucine proline-enriched proteoglycan (leprecan) 1
D08	N/A	XM_003748656	LOC683206	Similar to Tumor necrosis factor, alpha-induced protein 3 (Putative DNA binding protein A20) (Zinc finger protein A20)
D09	Rn.22436	XM_243524	Lrp1	Low density lipoprotein-related protein 1 (alpha-2-macroglobulin receptor)
D10	Rn.12698	NM_001106321	Lrp5	Low density lipoprotein receptor-related protein 5
D11	Rn.32960	NM_001107892	Lrp6	Low density lipoprotein receptor-related protein 6
D12	Rn.160577	NM_080769	Lta	Lymphotoxin alpha (TNF superfamily, member 1)
E01	Rn.40921	NM_021586	Ltbp2	Latent transforming growth factor beta binding protein 2
E02	Rn.172813	NM_001109391	Mab21l2	Mab-21-like 2 (C. elegans)
E03	Rn.6422	NM_031054	Mmp2	Matrix metalloproteinase 2
E04	Rn.44460	NM_019151	Mstn	Myostatin
E05	Rn.10494	XM_342975	Mthfr	Methylenetetrahydrofolate reductase (NAD(P)H)
E06	Rn.148475	NM_001244933	Nfatc1	Nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 1
E07	Rn.10154	NM_012990	Nog	Noggin
E08	Rn.44265	NM_021838	Nos3	Nitric oxide synthase 3, endothelial cell

Position	UniGene	GenBank	Symbol	Description
E09	Rn.9714	NM_012614	Npy	Neuropeptide Y
E10	Rn.90070	NM_012576	Nr3c1	Nuclear receptor subfamily 3, group C, member 1
E11	Rn.10510	NM_019256	P2rx7	Purinergic receptor P2X, ligand-gated ion channel, 7
E12	Rn.12945	NM_175869	Plod2	Procollagen lysine, 2-oxoglutarate 5-dioxygenase 2
F01	Rn.9759	NM_012629	Prl	Prolactin
F02	Rn.9768	NM_017044	Pth	Parathyroid hormone
F03	Rn.48025	NM_020073	Pth1r	Parathyroid hormone 1 receptor
F04	Rn.9750	NM_012636	Pthlh	Parathyroid hormone-like hormone
F05	Rn.214214	NM_053470	Runx2	Runt-related transcription factor 2
F06	Rn.163333	XM_224987	Sfrp1	Secreted frizzled-related protein 1
F07	Rn.10788	NM_053544	Sfrp4	Secreted frizzled-related protein 4
F08	Rn.37473	NM_012650	Shbg	Sex hormone binding globulin
F09	Rn.95369	NM_030584	Sost	Sclerostosis
F10	Rn.98989	NM_012656	Sparc	Secreted protein, acidic, cysteine-rich (osteonectin)
F11	Rn.8871	NM_012881	Spp1	Secreted phosphoprotein 1
F12	Rn.33229	NM_032612	Stat1	Signal transducer and activator of transcription 1
G01	Rn.40136	NM_021578	Tgfb1	Transforming growth factor, beta 1
G02	Rn.10161	NM_021989	Timp2	TIMP metalloproteinase inhibitor 2
G03	Rn.180134	XM_001063501	Tnfrsf11a	Tumor necrosis factor receptor superfamily, member 11a
G04	Rn.202973	NM_012870	Tnfrsf11b	Tumor necrosis factor receptor superfamily, member 11b
G05	Rn.83633	NM_130426	Tnfrsf1b	Tumor necrosis factor receptor superfamily, member 1b
G06	Rn.64517	NM_057149	Tnfsf11	Tumor necrosis factor (ligand) superfamily, member 11
G07	Rn.87913	NM_012888	Tshr	Thyroid stimulating hormone receptor
G08	Rn.161904	NM_053530	Twist1	Twist homolog 1 (Drosophila)
G09	Rn.10911	NM_017058	Vdr	Vitamin D (1,25-dihydroxyvitamin D3) receptor
G10	Rn.1923	NM_031836	Vegfa	Vascular endothelial growth factor A
G11	Rn.218544	NM_001108111	Wnt10b	Wingless-type MMTV integration site family, member 10B
G12	Rn.218621	XM_220546	Wnt3a	Wingless-type MMTV integration site family, member 3A
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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