

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

Human Osteoporosis

Cat. no. 330231 PAHS-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 Human 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	Hs.1211	NM_001611	ACP5	Acid phosphatase 5, tartrate resistant
A02	Hs.320892	NM_018417	ADCY10	Adenylate cyclase 10 (soluble)
A03	Hs.654431	NM_000697	ALOX12	Arachidonate 12-lipoxygenase
A04	Hs.73809	NM_001140	ALOX15	Arachidonate 15-lipoxygenase
A05	Hs.89499	NM_000698	ALOX5	Arachidonate 5-lipoxygenase
A06	Hs.75431	NM_000478	ALPL	Alkaline phosphatase, liver/bone/kidney
A07	Hs.496240	NM_000044	AR	Androgen receptor
A08	Hs.654541	NM_199173	BGLAP	Bone gamma-carboxyglutamate (gla) protein
A09	Hs.73853	NM_001200	BMP2	Bone morphogenetic protein 2
A10	Hs.473163	NM_001719	BMP7	Bone morphogenetic protein 7
A11	Hs.155097	NM_000067	CA2	Carbonic anhydrase II
A12	Hs.37058	NM_001741	CALCA	Calcitonin-related polypeptide alpha
B01	Hs.489127	NM_001742	CALCR	CALCITONIN RECEPTOR
B02	Hs.435615	NM_000388	CASR	Calcium-sensing receptor
B03	Hs.472860	NM_001250	CD40	CD40 molecule, TNF receptor superfamily member 5
B04	Hs.459649	NM_001287	CLCN7	Chloride channel 7
B05	Hs.73037	NM_001841	CNR2	Cannabinoid receptor 2 (macrophage)
B06	Hs.172928	NM_000088	COL1A1	Collagen, type I, alpha 1
B07	Hs.489142	NM_000089	COL1A2	Collagen, type I, alpha 2
B08	Hs.370408	NM_000754	COMT	Catechol-O-methyltransferase
B09	Hs.517888	NM_006371	CRTAP	Cartilage associated protein
B10	Hs.632466	NM_000396	CTSK	Cathepsin K
B11	Hs.438016	NM_000102	CYP17A1	Cytochrome P450, family 17, subfamily A, polypeptide 1
B12	Hs.260074	NM_000103	CYP19A1	Cytochrome P450, family 19, subfamily A, polypeptide 1
C01	Hs.414480	NM_001352	DBP	D site of albumin promoter (albumin D-box) binding protein
C02	Hs.40499	NM_012242	DKK1	Dickkopf homolog 1 (Xenopus laevis)
C03	Hs.527295	NM_006208	ENPP1	Ectonucleotide pyrophosphatase/phosphodiesterase 1
C04	Hs.208124	NM_000125	ESR1	Estrogen receptor 1
C05	Hs.729020	NM_001437	ESR2	Estrogen receptor 2 (ER beta)
C06	Hs.110849	NM_004451	ESRRA	Estrogen-related receptor alpha
C07	Hs.264887	NM_015850	FGFR1	Fibroblast growth factor receptor 1
C08	Hs.533683	NM_000141	FGFR2	Fibroblast growth factor receptor 2
C09	Hs.37023	NM_021081	GHRH	Growth hormone releasing hormone
C10	Hs.195040	NM_005525	HSD11B1	Hydroxysteroid (11-beta) dehydrogenase 1
C11	Hs.160562	NM_000618	IGF1	Insulin-like growth factor 1 (somatomedin C)
C12	Hs.438102	NM_000597	IGFBP2	Insulin-like growth factor binding protein 2, 36kDa
D01	Hs.654378	NM_000585	IL15	Interleukin 15
D02	Hs.654458	NM_000600	IL6	Interleukin 6 (interferon, beta 2)
D03	Hs.709210	NM_000565	IL6R	Interleukin 6 receptor
D04	Hs.644352	NM_181501	ITGA1	Integrin, alpha 1
D05	Hs.218040	NM_000212	ITGB3	Integrin, beta 3 (platelet glycoprotein IIIa, antigen CD61)
D06	Hs.194236	NM_000230	LEP	Leptin
D07	Hs.437656	NM_022356	LEPRE1	Leucine proline-enriched proteoglycan (leprecan) 1
D08	Hs.162757	NM_002332	LRP1	Low density lipoprotein receptor-related protein 1
D09	Hs.6347	NM_002335	LRP5	Low density lipoprotein receptor-related protein 5
D10	Hs.584775	NM_002336	LRP6	Low density lipoprotein receptor-related protein 6
D11	Hs.36	NM_000595	LTA	Lymphotoxin alpha (TNF superfamily, member 1)
D12	Hs.512776	NM_000428	LTBP2	Latent transforming growth factor beta binding protein 2
E01	Hs.584852	NM_006439	MAB21L2	Mab-21-like 2 (C. elegans)
E02	Hs.513617	NM_004530	MMP2	Matrix metalloproteinase 2 (gelatinase A, 72kDa gelatinase, 72kDa type IV collagenase)
E03	Hs.41565	NM_005259	MSTN	Myostatin
E04	Hs.214142	NM_005957	MTHFR	Methylenetetrahydrofolate reductase (NAD(P)H)
E05	Hs.534074	NM_172390	NFATC1	Nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 1
E06	Hs.248201	NM_005450	NOG	Noggin
E07	Hs.707978	NM_000603	NOS3	Nitric oxide synthase 3 (endothelial cell)
E08	Hs.1832	NM_000905	NPY	Neuropeptide Y

Position	UniGene	GenBank	Symbol	Description
E09	Hs.122926	NM_000176	NR3C1	Nuclear receptor subfamily 3, group C, member 1 (glucocorticoid receptor)
E10	Hs.729169	NM_002562	P2RX7	Purinergic receptor P2X, ligand-gated ion channel, 7
E11	Hs.477866	NM_182943	PLOD2	Procollagen-lysine, 2-oxoglutarate 5-dioxygenase 2
E12	Hs.1905	NM_000948	PRL	Prolactin
F01	Hs.37045	NM_000315	PTH	Parathyroid hormone
F02	Hs.1019	NM_000316	PTH1R	Parathyroid hormone 1 receptor
F03	Hs.591159	NM_002820	PTH1H	Parathyroid hormone-like hormone
F04	Hs.535845	NM_004348	RUNX2	Runt-related transcription factor 2
F05	Hs.713546	NM_003012	SFRP1	Secreted frizzled-related protein 1
F06	Hs.658169	NM_003014	SFRP4	Secreted frizzled-related protein 4
F07	Hs.632235	NM_001040	SHBG	Sex hormone-binding globulin
F08	Hs.349204	NM_025237	SOST	Sclerostin
F09	Hs.111779	NM_003118	SPARC	Secreted protein, acidic, cysteine-rich (osteonectin)
F10	Hs.313	NM_000582	SPP1	Secreted phosphoprotein 1
F11	Hs.642990	NM_007315	STAT1	Signal transducer and activator of transcription 1, 91kDa
F12	Hs.645227	NM_000660	TGFB1	Transforming growth factor, beta 1
G01	Hs.633514	NM_003255	TIMP2	TIMP metalloproteinase inhibitor 2
G02	Hs.211600	NM_006290	TNFAIP3	Tumor necrosis factor, alpha-induced protein 3
G03	Hs.204044	NM_003839	TNFRSF11A	Tumor necrosis factor receptor superfamily, member 11a, NFKB activator
G04	Hs.81791	NM_002546	TNFRSF11B	Tumor necrosis factor receptor superfamily, member 11b
G05	Hs.256278	NM_001066	TNFRSF1B	Tumor necrosis factor receptor superfamily, member 1B
G06	Hs.333791	NM_003701	TNFSF11	Tumor necrosis factor (ligand) superfamily, member 11
G07	Hs.160411	NM_000369	TSHR	Thyroid stimulating hormone receptor
G08	Hs.66744	NM_000474	TWIST1	Twist homolog 1 (Drosophila)
G09	Hs.524368	NM_000376	VDR	Vitamin D (1,25-dihydroxyvitamin D3) receptor
G10	Hs.73793	NM_003376	VEGFA	Vascular endothelial growth factor A
G11	Hs.91985	NM_003394	WNT10B	Wingless-type MMTV integration site family, member 10B
G12	Hs.336930	NM_033131	WNT3A	Wingless-type MMTV integration site family, member 3A
H01	Hs.520640	NM_001101	ACTB	Actin, beta
H02	Hs.534255	NM_004048	B2M	Beta-2-microglobulin
H03	Hs.592355	NM_002046	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase
H04	Hs.412707	NM_000194	HPRT1	Hypoxanthine phosphoribosyltransferase 1
H05	Hs.546285	NM_001002	RPLP0	Ribosomal protein, large, P0
H06	N/A	SA_00105	HGDC	Human 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.

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at www.qiagen.com or can be requested from QIAGEN Technical Services or your local distributor.

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