

Oligo GEMArray[®] DNA Microarray: Rat Cardiovascular Disease Biomarkers

Catalog Number

ORN-037
ERN-037

Format:

HybTube (Standard protocol)
HybPlate (Higher throughput protocol)

Description

The Oligo GEMArray[®] Rat Cardiovascular Disease Biomarkers Microarray profiles the expression of 113 genes useful as molecular markers for cardiovascular disease progression. This array is designed with clinical researchers and research pathologists in mind. Genes that may serve as diagnosis and/or prognosis markers for the principal cardiovascular diseases, heart disease and stroke are represented. Genes involved in atherosclerosis and hypertension are represented including genes involved in the related processes of inflammation, apoptosis, and cell adhesion. Biomarkers for risk of cardiovascular disease and genes associated with a failing or infarcted heart are selected for this array based on published studies of *in vivo* and *in vitro* cardiovascular disease models. A complete expression profile of these genes should serve as an effective tool to unlock the molecular mechanisms that govern the onset and progression of cardiovascular diseases. Through a simple side-by-side hybridization experiment you can determine differential gene expression between your samples.

Functional Gene Groupings

Cell Adhesion:

Cell-cell Adhesion: Icam1, Vcam1.

Cell-matrix Adhesion: Itga10, Itga2, Itga3, Itga4, Itga5, Itga6, Itga7, Itga8, Itga9, Itgad (Itgax), Itgae, Itgal, Itgam, Itgav, Itgb1, Itgb2, Itgb3, Itgb4, Itgb5, Itgb6, Itgb7, Itgb8, LOC685004 (Itga9), LOC685269 (Itga2b).

Other Cell Adhesion Molecules: Eva, Il18, Pecam, Sele, Sell, Selp, Selpl, Tnfsf5.

Immune Response:

Cellular Defense Response: Ccr2, Il10, Il18.

Cytokine Biosynthesis: Apoa2, Ccl2, Ifng, Il10, Il18, Il1b, Il6, Nfkb1.

Humoral Immune Response: Ccr2, Tnfrsf5, Tnfsf5.

Immune Cell Activation: Apoa2, Ifng, Il10, Il18, Nos2, Tnfrsf5, Tnfsf5.

Inflammatory Response: Ccl2, Ccr2, Ifng, Il1b, Itgam, Itgb2, Nos2, Pla2g7, Pparg, Selp, Tnfrsf1a, Tnfrsf1b, Tnfsf5.

Other Genes Related to the Immune Response: Apoe, Crp, Il1rn, Lta, Ltb, Pon1, Tnf, Tnfrsf6 (Fas), Tnfsf6 (Fasl).

Apoptosis:

Anti-apoptosis: Il10, Tnfsf5.

Induction of Apoptosis: Apoe, Il18, Tnfrsf6 (Fas).

Other Genes Related to Apoptosis: Ifng, Il6, Nfkb1, Tnfrsf1a, Tnfrsf5, Tnfsf6 (Fasl).

Extracellular Matrix (ECM) Molecules:

ECM Proteases: Ace, Apoc2, F7, Mmp13, Mmp1a, Mmp2, Mmp9, Pappa, Plat, Plau.

ECM Protease Inhibitors: Serpine1, Timp1.

Other ECM Molecules: Apoa1, Apoa2, Apoa4, Apoa5, Apoc1, Apoc3, Apoc4, Apod, Apoe, Apoh, Ccl2, Crlf1, Crp, Edn1, Edn2, Edn3, Eva, F3, Fga, Fgb, Fgg, Glg1, Grn, Ifng, Il10, Il18, Il1b, Il1rn, Il6, Il6st, Itga2, Itga5, Itga7, Itgae, Itgal, Itgb1, Itgb2, Itgb5, Itgb7, Lcat, LOC500761 (Apof), LOC685004 (Itga9), LOC685269 (Itga2b), Msln, Nppb, Npy, Pecam, Pla2g7, Plaur, Pltp, Pon1, Pon2, Sele, Sell, Selp, Selpl, Thbd, Tnfrsf1a, Tnfrsf1b, Tnfsf6 (Fasl), Vcam1, Vwf.

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Cell Growth: Amh, Ccr2, Edn3, Glg1, Ifng, Il10, Il18, Il1b, Il1rn, Il6, Itga4, Itgb1, Itgb3, Pappa, Pecam, Pparg, Tnfrsf1b.

Blood Coagulation: Cacna1b, F3, F7, Mmp13, Mmp2, Nos2, Thbd, Tnfsf5, Tnnc1, Tnni3, Vwf.

Circulation:

Regulation of Blood Pressure: Cacna1b, Edn1, Edn2, Edn3, Npy.

Regulation of Heart Contraction Rate: Cacna1b, Gnao, Tnni3.

Regulation of Vasoconstriction: Edn1, Edn2, Edn3.

Other Genes Related to Circulation: Apoe, Dbp, Mthfr, Pon1.

Lipid Metabolism:

Cholesterol Metabolism: Apoa1, Apoa2, Apoa4, Apob, Apoe, Lcat, Pon1.

Lipoprotein Metabolism: Apoa1, Apoa2, Apoa4, Apoa5, Apoc1, Apoc3, Apoe, Ldlr, Oldlr1 (Olr1), Pon1.

Other Genes Related to Lipid Metabolism: Apoc2, Apoc4, Apod, Hsd11b1, Il1rn, Pecam, Pla2g7, Pltp.

Genes Associated with a Failing or Infarcted Heart: Ckm, Crp, Ctf1, F3, Il6st, Mb, Nppa, Nppb, Tnnc1, Tnni3, Tnnt2.

Storage Conditions

Please check the kit components immediately after you receive this package. SuperArray is only responsible for missing items reported within two (2) business days of receipt.

GEArray microarrays are shipped at ambient temperature enclosed in either a HybTube or ExpressPak Storage Box. They should be stored at -20°C upon receipt.

References

1. Blake GJ, Ridker PM. Inflammatory bio-markers and cardiovascular risk prediction. *J Intern Med.* 2002 Oct; **252** (4): 283-94.
2. Shin WS, Szuba A, Rockson SG. The role of chemokines in human cardiovascular pathology: enhanced biological insights. *Atherosclerosis.* 2002 Jan; **160** (1): 91-102.
3. Pai JK, Curhan GC, Cannuscio CC, Rifai N, Ridker PM, Rimm EB. Stability of novel plasma markers associated with cardiovascular disease: processing within 36 hours of specimen collection. *Clin Chem.* 2002 Oct; **48** (10): 1781-4.
4. Schumacher A, Seljeflot I, Sommervoll L, Christensen B, Otterstad JE, Arnesen H. Increased levels of endothelial haemostatic markers in patients with coronary heart disease. *Thromb Res.* 2002 Jan 1; **105**(1): 25-31.
5. May AE, Schmidt R, Kanse SM, Chavakis T, Stephens RW, Schomig A, Preissner KT, Neumann FJ. Urokinase receptor surface expression regulates monocyte adhesion in acute myocardial infarction. *Blood.* 2002 Nov 15; **100** (10): 3611-7.
6. Frijns CJ, Kappelle LJ. Inflammatory cell adhesion molecules in ischemic cerebrovascular disease. *Stroke.* 2002 Aug; **33** (8): 2115-22.

Product Specification Sheet

Oligo GEArray[®] Rat Cardiovascular Disease Biomarkers Microarray

Array Layout:

Ppia 1	Ace 2	Amh 3	Apoa1 4	Apoa2 5	Apoa4 6	Apoa5 7	Apob 8
Apoc1 9	Apoc2_predicted 10	Apoc3 11	Apoc4 12	Apod 13	Apoe 14	ApoH 15	Cacna1b 16
Ccl2 17	Ccr2 18	Ckm 19	Crif1_predicted 20	Crp 21	Ctf1 22	Dbp 23	Edn1 24
Edn2 25	Edn3_mapped 26	Eva_predicted 27	F3 28	F7 29	Fga 30	Fgb 31	Fgg 32
Glg1 33	Gnao 34	Grn 35	Hsd11b1 36	Icam1 37	Ifng 38	Il10 39	Il18 40
Il1b 41	Il1rn 42	Il6 43	Il6st 44	Itga10_predicted 45	Itga2 46	Itga3_predicted 47	Itga4_mapped 48
Itga5_mapped 49	Itga6 50	Itga7 51	Itga8 52	Itgae 53	Itgae 54	Itgal 55	Itgam 56
Itgav_predicted 57	Itgb1 58	Itgb2 59	Itgb3 60	Itgb4 61	Itgb5 62	Itgb6 63	Itgb7 64
Itgb8_predicted 65	Lcat 66	Ldlr 67	LOC500761 68	LOC685004 69	LOC685269 70	Lta 71	Ltb 72
Mb 73	Mmp13 74	Mmp1a_predicted 75	Mmp2 76	Mmp9 77	Msln 78	Mthfr_predicted 79	Nfkb1 80
Nos2 81	Nppa 82	Nppb 83	Npy 84	Oldlr1 85	Pappa_predicted 86	Pecam 87	Pla2g7 88
Plat 89	Plau 90	Plaur 91	Pltp_predicted 92	Pon1 93	Pon2 94	Pparg 95	Sele 96
Sell 97	Selp 98	Selp_predicted 99	Serpine1 100	Thbd 101	Timp1 102	Tnf 103	Tnfrsf1a 104
Tnfrsf1b 105	Tnfrsf5 106	Tnfrsf6 107	Tnfrsf5 108	Tnfrsf6 109	Tnnc1 110	Tnni3 111	Tnnt2 112
Vcam1 113	Vwf 114	PUC18 115	Blank 116	Blank 117	AS1R2 118	AS1R1 119	AS1 120
Rpl32 121	Ldha 122	Aldoa 123	Aldoa 124	Gapd 125	Gapd 126	BAS2C 127	BAS2C 128

Gene Table

Position	UniGene	GenBank	Symbol	Description	Gene Name
1	Rn.1463	NM_017101	Ppia	Peptidylprolyl isomerase A	CYCA
2	Rn.10149	NM_012544	Ace	Aniotensin 1 converting enzyme	Dcp1/StsRR92
3	Rn.19121	NM_012902	Amh	Anti-Mullerian hormone	MIS
4	Rn.10308	NM_012738	Apoa1	Apolipoprotein A-I	apoA-I
5	Rn.89304	NM_013112	Apoa2	Apolipoprotein A-II	APOAII
6	Rn.15739	NM_012737	Apoa4	Apolipoprotein A-IV	AcI/Apoc4
7	Rn.48763	NM_080576	Apoa5	Apolipoprotein A-V	MGC108612
8	Rn.33815	NM_019287	Apob	Apolipoprotein B	Aa1064/Ac1-060
9	Rn.8887	NM_012824	Apoc1	Apolipoprotein C-I	ALPCI
10	Rn.16843	XM_214872	Apoc2_predicted	Apolipoprotein C-II (predicted)	LOC292697/RGD1560725
11	Rn.36813	NM_012501	Apoc3	Apolipoprotein C-III	apo-CIII
12	Rn.33157	XM_214853	Apoc4	Apolipoprotein C-IV	AcI
13	Rn.11339	NM_012777	Apod	Apolipoprotein D	AOPDGN
14	Rn.32351	NM_138828	Apoe	Apolipoprotein E	APOEA
15	Rn.1824	NM_001009626	ApoH	Apolipoprotein H	N/A
16	Rn.85880	NM_147141	Cacna1b	Calcium channel, voltage-dependent, N type, alpha 1B subunit	Cacna1b
17	Rn.4772	NM_031530	Ccl2	Chemokine (C-C motif) ligand 2	MCP-1/Scya2
18	Rn.138119	NM_021866	Ccr2	Chemokine (C-C motif) receptor 2	Ccr2
19	Rn.10756	NM_012530	Ckm	Creatine kinase, muscle	Ckmm
20	Rn.38637	XM_214312	Crif1_predicted	Cytokine receptor-like factor 1 (predicted)	CrI1
21	Rn.16463	NM_017096	Crp	C-reactive protein, pentraxin-related	Crp
22	Rn.10253	NM_017129	Ctf1	Cardiotrophin 1	Ctf1
23	Rn.11274	NM_012543	Dbp	D site albumin promoter binding protein	MGC105474
24	Rn.10918	NM_012548	Edn1	Endothelin 1	Et1
25	Rn.10642	NM_012549	Edn2	Endothelin 2	Et2
26	N/A	XM_345480	Edn3_mapped	Endothelin 3 (mapped)	Edn3/Et3
27	Rn.198814	XM_236197	Eva_predicted	Epithelial V-like antigen (predicted)	N/A
28	Rn.9980	NM_013057	F3	Coagulation factor III	MGC93621
29	Rn.86416	NM_152846	F7	Coagulation factor VII	F7
30	Rn.128860	NM_001008724	Fga	Fibrinogen, alpha polypeptide	Ac1873/Fba5e
31	Rn.11416	NM_020071	Fgb	Fibrinogen, B beta polypeptide	Ab1-181/Ab1-216
32	Rn.1702	NM_012559	Fgg	Fibrinogen, gamma polypeptide	Fgg
33	Rn.89086	NM_017211	Glg1	Golgi apparatus protein 1	MG-160/Selel
34	Rn.90161	NM_017327	Gnao	Guanine nucleotide binding protein, alpha o	Gnao1/RATBPPTPC
35	Rn.5820	NM_017113	Grn	Granulin	Grn
36	Rn.888	NM_017080	Hsd11b1	Hydroxysteroid 11-beta dehydrogenase 1	Hsd11b1
37	Rn.12	NM_012967	Icam1	Intercellular adhesion molecule 1	CD54/ICAM
38	Rn.10795	NM_138880	Ifng	Interferon gamma	IFNG2
39	Rn.9868	NM_012854	Il10	Interleukin 10	IL10X
40	Rn.11118	NM_019165	Il18	Interleukin 18	IL-18
41	Rn.9869	NM_031512	Il1b	Interleukin 1 beta	Il1b
42	Rn.85806	NM_022194	Il1rn	Interleukin 1 receptor antagonist	IL-1ra

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Position	UniGene	GenBank	Symbol	Description	Gene Name
43	Rn.9873	NM 012589	Il6	Interleukin 6	Il6/Ilfb2
44	Rn.12138	NM 001008725	Il6st	Interleukin 6 signal transducer	Ac1055
45	Rn.82866	XM 227469	Itga10_predicted	Integrin, alpha 10 (predicted)	N/A
46	Rn.83597	XM 345156	Itga2	Integrin, alpha 2	CD49B
47	Rn.154664	XM 340884	Itga3_predicted	Integrin alpha 3 (predicted)	Itga3
48	Rn.12704	XM 230033	Itga4_mapped	Integrin alpha 4 (mapped)	Itga4
49	Rn.100796	XM 235707	Itga5_mapped	Integrin alpha 5 (mapped)	Itga5
50	Rn.22382	XM 215984	Itga6	Integrin, alpha 6	Itga6
51	Rn.54492	NM 030842	Itga7	Integrin alpha 7	MGC105724
52	Rn.69726	XM 225600	Itga8	Integrin alpha 8	Itga8
53	Rn.34728	NM 031691	Itgad	Integrin, alpha D	Itgax
54	Rn.29975	NM 031768	Itgae	Integrin, alpha E, epithelial-associated	Itgae
55	Rn.14655	NM 001033998	Itgal	Integrin alpha L	Itgal
56	Rn.54465	NM 012711	Itgam	Integrin alpha M	Cd11b
57	Rn.23339	XM 230950	Itgav_predicted	Integrin, alpha V (vitronectin receptor, alpha polypeptide, antigen CD51)	Cd51/Itgav
58	Rn.25733	NM 017022	Itgb1	Integrin beta 1 (fibronectin receptor beta)	Itgb1
59	Rn.42962	XM 228072	Itgb2	Integrin beta 2	Cd18
60	Rn.17129	NM 153720	Itgb3	Integrin beta 3	Itgb3
61	Rn.10727	NM 013180	Itgb4	Integrin beta 4	Itgb4
62	Rn.16988	NM 147139	Itgb5	Integrin, beta 5	Itgb5
63	Rn.19828	NM 001004263	Itgb6	Integrin, beta 6	MGC94023
64	Rn.10767	XM 343336	Itgb7	Integrin, beta 7	Itgb7
65	Rn.72676	XM 343126	Itgb8_predicted	Integrin beta 8 (predicted)	N/A
66	Rn.10481	NM 017024	Lcat	Lecithin cholesterol acyltransferase	MGC108718
67	Rn.10483	NM 175762	Ldlr	Low density lipoprotein receptor	LDLRA
68	Rn.101696	NM 001024351	LOC500761	Similar to apolipoprotein F	Apof
69	Rn.198229	XM 001061864	LOC685004	Similar to integrin alpha 9	Itga9
70	Rn.128177	XM 001063315	LOC685269	Similar to Integrin alpha-IIb precursor (Platelet membrane glycoprotein IIb)	Itga2b
71	Rn.9820	NM 080769	Lta	Lymphotoxin A	Tnfb
72	Rn.16681	NM 212507	Ltb	Lymphotoxin B	MGC108924
73	Rn.40511	NM 021588	Mb	Myoglobin	Mb
74	Rn.10997	XM 343345	Mmp13	Matrix metalloproteinase 13	Mmp13
75	Rn.79007	XM 235794	Mmp1a_predicted	Matrix metalloproteinase 1a (interstitial collagenase) (predicted)	LOC300339
76	Rn.6422	NM 031054	Mmp2	Matrix metalloproteinase 2	Mmp2
77	Rn.10209	NM 031055	Mmp9	Matrix metalloproteinase 9	Mmp9
78	Rn.18607	NM 031658	Msln	Mesothelin	Msln
79	Rn.10494	XM 342975	Mthfr_predicted	5,10-methylenetetrahydrofolate reductase (NADPH) (predicted)	Mthfr
80	Rn.2411	XM 342346	Nfkb1	Nuclear factor of kappa light chain gene enhancer in B-cells 1, p105	NF-kB
81	Rn.10400	NM 012611	Nos2	Nitric oxide synthase 2, inducible	Nos2a/iNos
82	Rn.2004	NM 012612	Nppa	Natriuretic peptide precursor type A	ANF/ANP
83	Rn.3835	NM 031545	Nppb	Natriuretic peptide precursor type B	BNP/Bnf
84	Rn.9714	NM 012614	Npy	Neuropeptide Y	NPY02/RATNPY
85	Rn.87449	NM 133306	Oldr1	Oxidized low density lipoprotein (lectin-like) receptor 1	LOX-1/Oldr1
86	Rn.38908	XM 233037	Pappa_predicted	Pregnancy-associated plasma protein A (predicted)	Pappa predicted
87	Rn.1878	NM 031591	Pecam	Platelet/endothelial cell adhesion molecule	CD31
88	Rn.90768	NM_001009353	Pla2g7	Phospholipase A2, group VII (platelet-activating factor acetylhydrolase, plasma)	MGC95107
89	Rn.107102	NM 013151	Plat	Plasminogen activator, tissue	PATISS/PA
90	Rn.6064	NM 013085	Plau	Plasminogen activator, urokinase	UPAM
91	Rn.82711	NM 017350	Plaur	Plasminogen activator, urokinase receptor	Par/Plaur3
92	Rn.117434	XM 001072197	Pltp_predicted	Phospholipid transfer protein (predicted)	Pltp
93	Rn.20732	NM 032077	Pon1	Paraoxonase 1	Pon1
94	Rn.1100	NM 001013082	Pon2	Paraoxonase 2	N/A
95	Rn.23443	NM 013124	Pparg	Peroxisome proliferator activated receptor, gamma	Pparg
96	Rn.10359	NM 138879	Sele	Selectin, endothelial cell	Sele
97	Rn.10461	NM 019177	Sell	Selectin, lymphocyte	L-selectin/LECAM-1
98	Rn.10012	NM 013114	Selp	Selectin, platelet	PSELECT
99	Rn.162149	NM 001013230	Selpl_predicted	Selectin, platelet (p-selectin) ligand (predicted)	Psq1
100	Rn.29367	NM 012620	Serpine1	Serine (or cysteine) proteinase inhibitor, clade E, member 1	PAI1A/Pai1
101	Rn.88295	NM 031771	Thbd	Thrombomodulin	Thbd
102	Rn.25754	NM 053819	Timp1	Tissue inhibitor of metalloproteinase 1	TIMP-1/Timp
103	Rn.2275	NM 012675	Tnf	Tumor necrosis factor superfamily, member 2	RATTNF/TNF-alpha
104	Rn.11119	NM 013091	Tnfrsf1a	Tumor necrosis factor receptor superfamily, member 1a	Tnfr1
105	Rn.83633	NM 130426	Tnfrsf1b	Tumor necrosis factor receptor superfamily, member 1b	Tnfr2
106	Rn.25180	NM 134360	Tnfrsf5	Tumor necrosis factor receptor superfamily, member 5	Cd40
107	Rn.162521	NM 139194	Tnfrsf6	Tumor necrosis factor receptor superfamily, member 6	LOC365454
108	Rn.44218	NM 053353	Tnfsf5	Tumor necrosis factor (ligand) superfamily, member 5	Tnfsf5/CD40 ligand
109	Rn.9725	NM 012908	Tnfsf6	Tumor necrosis factor (ligand) superfamily, member 6	Apt1Lq1/FasL
110	Rn.15460	NM 001034105	Tnnc1	Troponin C, cardiac/slow skeletal	Tncc
111	Rn.64141	NM 017144	Tnnc1	Troponin I, cardiac	TnI/cTNI
112	Rn.9965	NM 012676	Tnnt2	Troponin T2, cardiac	CTTG/Ct
113	Rn.11267	NM 012889	Vcam1	Vascular cell adhesion molecule 1	VCAM1B
114	Rn.35561	XM 342759	Vwf	Von Willebrand factor	Vwf
115	N/A	L08752	PUC18	PUC18 Plasmid DNA	pUC18
116	Blank	Blank	Blank	Blank	
117	Blank	Blank	Blank	Blank	
118	N/A	N/A	AS1R2	Artificial Sequence 1 Related 2 (80% identity)(48/60)	N/A
119	N/A	N/A	AS1R1	Artificial Sequence 1 Related 1 (90% identity)(56/60)	N/A
120	N/A	N/A	AS1	Artificial Sequence 1	N/A
121	Rn.110966	NM 013226	Rpl32	Ribosomal protein L32	Rpl32
122	Rn.107896	NM 017025	Ldha	Lactate dehydrogenase A	Ldha
123	Rn.1774	NM 012495	Aldoa	Aldolase A	Aldoa
124	Rn.1774	NM 012495	Aldoa	Aldolase A	Aldoa
125	Rn.91450	NM 017008	Gapd	Glycerate dehydro-3-phosphate dehydrogenase	Gapd
126	Rn.91450	NM 017008	Gapd	Glycerate dehydro-3-phosphate dehydrogenase	Gapd
127	N/A	N/A	BAS2C	Biotinylated Artificial Sequence 2 Complementary sequence	N/A
128	N/A	N/A	BAS2C	Biotinylated Artificial Sequence 2 Complementary sequence	N/A