

# OHS-038

## Oligo GEArray® Human Atherosclerosis Microarray

### Description

The Oligo GEArray® Human Atherosclerosis Microarray is designed to analyze the relative expression of 113 atherosclerosis-related genes. Atherosclerosis is characterized by abnormal fatty deposits in and fibrosis of the inner layer of arteries. This progressive disease takes years to manifest itself as a partial or complete interruption of blood flow. Depending on the artery affected, atherosclerosis can lead to life-threatening acute conditions such as a heart attack or a stroke. It is a multi-factorial disease involving several different types of cells including endothelial cells, leukocytes and smooth muscle cells. Multiple biological processes are also involved such as blood coagulation, circulation, cell-adhesion, stress response, lipid transport and metabolism, cell growth, proliferation and apoptosis. Each of these pathways is represented on the array. Both *in vivo* and *in vitro* studies have demonstrated these genes to be important for the onset, progression and prevention of atherosclerosis. Determine differential expression of genes related to atherosclerosis in your experimental samples using the Oligo GEArray® Human Atherosclerosis Microarray.

### Functional Gene Groupings (more detailed information is provided in the gene table)

#### Response to Stress:

Inflammatory response: CCL11, CCL2, CCL20, CCL5, CCR1, CCR2, IL1R1, IL1R2, IL8, ITGB2, NFKB1, NOS3, PTGS2, SELE, SPP1, TNF, TNFRSF5.

Response to oxidative stress: APOE, CCL5, SOD1, SOD2.

Response to pest, pathogen or parasite: CCL2, CCL20, CCR2, CSF2, CSF3, FN1, IL13, IL1B, IL4, IL6, IL7, ITGB2, TNF, TNFRSF5.

Response to virus: CCL11, CCL5, IFNAR2, TNF.

Response to wounding: CCR1, CCR2, CTGF, FN1, PDGFB, TNF, VWF.

Other stress response genes: APOA2, IFNG, PPARG, VEGF.

#### Apoptosis:

Anti-apoptosis: BCL2, BCL2A1, BCL2L1, BIRC3, CCL2, CFLAR, IL1A, IL2, NFKB1, SERPINB2, SPP1, TGFB1, TNF, TNFAIP3, TNFRSF6.

Induction of apoptosis: APOE, BAX, BID, CFLAR, TNFRSF6.

Other apoptosis genes: IL1B, IL5, ITGB2, TNFRSF5.

#### Blood Coagulation and Circulation:

Blood coagulation: CD36, F7, FGA, FGB, ITGA2, ITGB3, LPA, SERPINE1.

Circulation: APOA1, APOA4, APOB, APOE, COL3A1, DSCR1, ELN, ENG, LPA, LPL, NPY, OLR1.

Platelet activation: PDGFA, PDGFB, PDGFRB, TNFRSF5, VWF.

Regulation of blood pressure: ACE, FGA, FGB.

#### Adhesion Molecules:

Cell-cell adhesion: CD44, CDH5, ICAM1, ICAM2, ITGB2, SELE, SELL, TNF, VCAM1, VEGF.

Cell-matrix adhesion: CD44, ITGA2, ITGA5, ITGAX, ITGB2, ITGB3, ITGB5, ITGB7, SPP1.

Other genes involved in adhesion: CCL11, CCL2, CCL5, CCR1, CD36, CTGF, ELN, ENG, FN1, IL8, LAMA1, SCARB1, SELPLG, THBS4, TNC, VWF.

#### Extracellular Molecules (ECMs):

ECM protease inhibitors: LPA, SERPINB2, SERPINE1.

ECM proteases: ACE, MMP1, MMP3, MMP9.

Extracellular matrix structural constituent: COL3A1, ELN, FN1.

Other extracellular molecules: ADFP, APOA1, APOA2, APOA4, APOB, APOE, CCL11, CCL2, CCL20, CCL5, CSF2, CSF3, CTGF, DTR, F7, FGA, FGB, FGF2, IFNAR2, IFNG, IL13, IL1A, IL1B, IL2, IL3, IL4, IL5, IL6, IL7, IL8, LAMA1, LCAT, LIF, LPL, NPY, PDGFA, PDGFB, PLTP, SPP1, THBS4, TNC, VEGF, VWF.

#### Lipid Transport and Metabolism:

Cholesterol metabolism: ABCA1, APOA1, APOB, APOE, CETP, IL4, LCAT, LDLR.

Fatty acid metabolism: CD36, FABP3, LPL, PPARA, PTGS1, PTGS2.

Lipid transport: ABCA1, APOA1, APOA2, APOA4, APOB, APOE, CETP, FABP3, LDLR, LPA, LPL, MSR1, PLTP.

Lipoprotein metabolism: APOA1, APOA2, APOA4, APOE, LDLR, LPL.

Steroid metabolism: NR1H3, PPARA, PPARG, RXRA.

Other lipid metabolism: ADFP, APOA2, APOA4, APOE, LPA, PLTP.

**OHS-038****Oligo GEArray® Human Atherosclerosis Microarray****Cell Growth and Proliferation:**

Growth factors and receptors: CSF2, KDR, PDGFRB, SPP1.

Negative regulation of cell proliferation: BCL2, FABP3, IL1A, IL1B, IL6, IL8.

Positive regulation of cell proliferation: CSF1, CSF3, DTR, FGA, FGB, FGF2, IL2, IL3, IL5, IL6, IL7, LIF, VEGF.

Regulation of cell cycle: DUSP6, FGF2, IL1A, IL1B, PDGFA, PDGFB, TGFB1, TGFB2, TGFB3, VEGF.

Other genes involved in cell growth and proliferation: CTGF, ELN, IFNG, IL13, IL4, NPY, TNFRSF5.

**Transcription Regulators:**

Nuclear receptor: NR1H3, PPARA, PPARD, PPARG, RXRA.

Other transcription regulators: DSCR1, EGR1, IL8, KLF2, NFKB1, SOD2, TNF, TNFAIP3.

**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.***

Oligo GEArrays are shipped at ambient temperature. They should be stored in the enclosed disposable hybridization tube at -20°C upon receipt.

**References**

1. Laukkanen J, Yla-Herttuala S. Genes involved in atherosclerosis. *Exp Nephrol.* 2002; 10 (2): 150-63.
2. Henriksen PA, Kotelevtsev Y. Application of gene expression profiling to cardiovascular disease. *Cardiovasc Res.* 2002 Apr; 54 (1): 16-24.
3. Monajemi H, Arkenbout EK, Pannekoek H. Gene expression in atherogenesis. *Thromb Haemost.* 2001 Jul; 86 (1): 404-12.
4. Depre C, Tomlinson JE, Kudej RK, Gaussin V, Thompson E, Kim SJ, Vatner DE, Topper JN, Vatner SF. Gene program for cardiac cell survival induced by transient ischemia in conscious pigs. *Proc Natl Acad Sci U S A.* 2001 Jul 31; 98 (16): 9336-41.
5. Friddle CJ, Koga T, Rubin EM, Bristow J. Expression profiling reveals distinct sets of genes altered during induction and regression of cardiac hypertrophy. *Proc Natl Acad Sci U S A.* 2000 Jun 6; 97 (12): 6745-50.
6. Shiffman D, Porter JG. Gene expression profiling of cardiovascular disease models. *Curr Opin Biotechnol.* 2000 Dec; 11 (6): 598-601.
7. Shiffman D, Mikita T, Tai JT, Wade DP, Porter JG, Seilhamer JJ, Somogyi R, Liang S, Lawn RM. Large scale gene expression analysis of cholesterol-loaded macrophages. *J Biol Chem.* 2000 Dec 1; 275 (48): 37324-32.
8. Topper JN, Cai J, Falb D, Gimbrone MA Jr. Identification of vascular endothelial genes differentially responsive to fluid mechanical stimuli: cyclooxygenase-2, manganese superoxide dismutase, and endothelial cell nitric oxide synthase are selectively up-regulated by steady laminar shear stress. *Proc Natl Acad Sci U S A.* 1996 Sep 17; 93 (19): 10417-22.