nCounter® CVD Pathophysiology Panel

Gene Expression Panel - Cardiovascular Disease (CVD)

Heart Disease • Arteriosclerosis • Hypertension • Cardiotoxicity • Regenerative Medicine

Rapidly advance your cardiovascular research with molecular insights that provide quick, actionable results. Explore how cardiovascular disfunction contributes to heart disease, hypertension and arteriosclerosis. Study the cardiotoxic effects of immune therapies or assess the role of aging and cell renewal in cardiac regenerative medicine.

Product Highlights

- Directly profile 800 genes across 50 pathways involved in CVD pathophysiology
  - Cardiovascular Pathology
  - Cardiovascular Physiology
  - Vascular Inflammation
  - Cellular Aging & Renewal
  - Metabolism
  - Mechano Signaling
  - Regulatory Signaling
  - Epigenetic Remodeling
- Measure cardiotoxicities resulting from therapeutic treatment
- Study the MOA of approved CVD drugs
- Explore cardiomyocyte recovery and regeneration
- Quantify the presence and relative abundance of 16 cell types present in cardiac tissue
- Compatible with a variety of sample types including blood, cardiac tissue, organoids, stem cells, engineered cell lines, explants, and organs on a chip
- Generate data in 24 hours with less than 30 minutes hands on time and simple data analysis

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
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</thead>
<tbody>
<tr>
<td>Number of Targets</td>
<td>800 (Human and Mouse), including 10 internal reference genes for data normalization.</td>
</tr>
<tr>
<td>Sample Input - Standard</td>
<td>25-300 ng</td>
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<tr>
<td>Sample Input - Low Input</td>
<td>As little as 1 ng with nCounter Low Input Kit and Primer Pools (sold separately)</td>
</tr>
<tr>
<td>Sample Type(s)</td>
<td>Blood, cardiac biopsies, xenografts, cultured cells/cell lysates, FFPE-derived RNA, total RNA, fragmented RNA</td>
</tr>
<tr>
<td>Customizable</td>
<td>Add up to 55 unique genes with Panel-Plus or up to 10 custom protein targets</td>
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<tr>
<td>Time to Results</td>
<td>Approximately 24 hours</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>nSolver™ Analysis Software (RUO), Advanced Analysis for cell profiling, ROSALIND® platform</td>
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</tbody>
</table>
Key Applications with the nCounter CVD Pathophysiology Panel

**Heart Disease/Hypertension /Arteriosclerosis**

- Atherosclerosis
- Cardiac Hypertrophy
- Cardiomyopathy
- Foam Cell Formation
- Ischemia
- Myocarditis

**Cardiotoxicity**

- Angiotensin System
- Cardiac Muscle Contraction
- Cardiac Electrophysiology
- GABAergic Signaling
- Vascular Smooth Muscle Contraction
- Vasopressin System
- Cardiac Morphogenesis
- ER Stress
- eNOS Activation
- IL-1 Signaling
- IL-6 Signaling
- Other Cytokine Signaling
- Immune Cell Infiltration
- JAK-STAT Signaling
- mTOR Signaling
- NF-kappaB Signaling
- PDK-AKT Signaling
- PPAR Signaling
- TLR Signaling
- TNF Signaling
- Checkpoint Signaling
- Apoptosis
- Autophagy
- Cell Cycle
- Senescence & Quiescence
- Telomere Maintenance

**Regenerative Medicine**

- ECM Remodeling
- Hippo Signaling
- Integrin Signaling
- Rho ROCK Signaling
- Calcium Signaling
- EGFR Signaling
- MAPK Signaling
- Notch Signaling
- TGF-beta Signaling
- VEGF Signaling
- Wnt Signaling
- Histone Modifications
- Acetyl Transferases
- Deacetylases
- Methyl Transferases

What molecular characteristics contribute to cardiovascular disease?

Study key pathways involved in cardiovascular pathology, physiology and pathway signaling.

Understand the impacts of lipid metabolism and metabolic disorders on CVD.

Explore the role of epigenetic remodeling enzymes in the initiation and progression of CVD.

How can cardiotoxicity be avoided?

Characterize the effects of immune response, inflammation, and immunomodulatory pathways on cardiac function.

Explore the cardiotoxic effects of immune therapies.

Assess novel drug targets for efficacy in the context of approved drug MOAs.

How can regenerative medicine help treat cardiovascular disease?

Uncover the roles of cellular aging, senescence and renewal on CVD.

Understand the relative abundance of cardiac specific cell types and their impact on gene expression pathways in regenerative tissue cultures.

Panel Themes

The CVD Pathophysiology Panel includes annotations across 8 functional themes related to cardiovascular dysfunction and disease. Pathway coverage is outlined in the table below.
**Cardiac Cell Profiling Feature**

Genes included in the CVD Pathophysiology Panel provide unique cell profiling data to measure the relative abundance of 16 different cardiac cell types. The table below summarizes the genes included in each cell type signature, as qualified through biostatistical approaches and selected literature in the field of cardiovascular disease.

<table>
<thead>
<tr>
<th>Cell Type</th>
<th>Associated Human Genes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiomyocytes (Atrial, Ventricular)</td>
<td>FHL2, MYL4, MYL7</td>
</tr>
<tr>
<td>Fibroblasts</td>
<td>DCN, PDGFRα</td>
</tr>
<tr>
<td>Endothelial Cells</td>
<td>CDH5, PECAM1, VWF</td>
</tr>
<tr>
<td>Mesothelial Cells</td>
<td>BNC1, MSLN</td>
</tr>
<tr>
<td>Vascular Smooth Muscle Cells</td>
<td>MYH11</td>
</tr>
<tr>
<td>Pericytes</td>
<td>ABCC9, KCNJ8</td>
</tr>
<tr>
<td>Neuronal Cells</td>
<td>NRXN1, PLP1</td>
</tr>
<tr>
<td>Adipocytes</td>
<td>FASN, GPAM, LEP</td>
</tr>
<tr>
<td>T Cells (Th1, CD45, CD8, Tregs)</td>
<td>PTPRC, CD8A, CD8B, CD3D, CD3E, CD3G, CD6, TBX21, FOXP3</td>
</tr>
<tr>
<td>Cytotoxic Cells</td>
<td>CTSW, GNLY, GZMA, GZMB, GZMH, KLRB1, KLRK1, NKG7, PRF1</td>
</tr>
<tr>
<td>NK Cells</td>
<td>KIR3DL1, NCR1, XCL1/2</td>
</tr>
<tr>
<td>Macrophages</td>
<td>CD163, CD68, CD84, MS4A4A</td>
</tr>
<tr>
<td>Dendritic Cells</td>
<td>CCL13, CD209</td>
</tr>
<tr>
<td>Neutrophils</td>
<td>CSF3R, FCGR3A/B, FPR1</td>
</tr>
<tr>
<td>Mast Cells</td>
<td>CPA3, HDC, MS4A2</td>
</tr>
<tr>
<td>B Cells</td>
<td>CD19, MS4A1, SPIB, TNFRSF17</td>
</tr>
</tbody>
</table>

**Customization with Panel Plus**

Customize your research project by adding up to 55 user-defined genes of interest with nCounter Panel Plus. Panel Plus capacity enables researchers to address content specific to their cardiovascular research areas of interest. Expand on pathways and core themes of the panel or include infectious disease content (i.e. COVID).

**nSolver™ Analysis Software**

NanoString offers advanced software tools that address the continuous demands of data analysis and the need to get simple answers to specific biological questions easily. Genes included in the CVD Pathophysiology Panel are annotated to allow for efficient analysis of relevant pathways.

**Analysis Modules available for CVD Pathophysiology:**

- Normalization
- Quality Control
- Individual Pathway Analysis
- Cell Profiling
- Differential Expression
- Gene Set Analysis
- Built-in compatibility for Panel Plus and Protein analysis
**ROSALIND**

**ROSALIND® Platform**

- ROSALIND is a cloud-based platform that enables scientists to analyze and interpret differential gene expression data without the need for bioinformatics or programming skills. ROSALIND makes analysis of nCounter data easy, with guided modules for:
- Normalization / Quality Control / Individual Pathway Analysis Differential Expression / Gene Set Analysis
- nCounter customers can access ROSALIND free of charge at [https://www.rosalind.bio/nanostring](https://www.rosalind.bio/nanostring)

**Ordering Information**

Gene Expression Panels arrive ready-to-use and generally ship within 24 hours following purchase.

<table>
<thead>
<tr>
<th>Product</th>
<th>Product Description</th>
<th>Quantity</th>
<th>Catalog Number</th>
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</thead>
<tbody>
<tr>
<td>nCounter® Human CVD Pathophysiology Panel</td>
<td>800 genes, including 10 internal reference genes for data normalization. Codeset Only.</td>
<td>12</td>
<td>XT-HSCVD-12</td>
</tr>
<tr>
<td>nCounter® Mouse CVD Pathophysiology Panel</td>
<td>800 genes, including 10 internal reference genes for data normalization. Codeset only.</td>
<td>12</td>
<td>XT-MSCVD-12</td>
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<tr>
<td>nCounter® Human CVD Pathophysiology Panel Standard</td>
<td>Standard containing a pool of synthetic DNA oligonucleotides that correspond to the target sequence of each of the unique probe targets in the panel.</td>
<td>12</td>
<td>PSTD-H-CVD-12</td>
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<tr>
<td>nCounter® Mouse CVD Pathophysiology Panel Standard</td>
<td>Standard containing a pool of synthetic DNA oligonucleotides that correspond to the target sequence of each of the unique probe targets in the panel.</td>
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<td>PSTD-M-CVD-12</td>
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<tr>
<td>Low RNA Input Kit</td>
<td>Kit for use with all Low RNA Input Primer Pools</td>
<td>48</td>
<td>LOW-RNA-48</td>
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<tr>
<td>nCounter® Master Kit Reagents and Cartridges</td>
<td>Reagents, cartridges, and consumables necessary for sample processing on nCounter MAX and FLEX Systems</td>
<td>12</td>
<td>NAA-AKIT-012</td>
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<tr>
<td>nCounter® SPRINT Cartridge 1 Cartridge, 12 lanes</td>
<td>Sample Cartridge for nCounter SPRINT System</td>
<td>12</td>
<td>SPRINT-CAR-1.0</td>
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<tr>
<td>nCounter SPRINT Reagent Pack</td>
<td>nCounter SPRINT Reagent Pack containing Reagents A, B, C, and Hybridization Buffer</td>
<td>192</td>
<td>SPRINT-REAG-KIT</td>
</tr>
</tbody>
</table>

**Selected Panel References**


**For more information visit [nanostring.com/CVD](https://nanostring.com/CVD)**