

# nCounter® PanCancer Panels Collection

Pathway Deregulation • Immune Profiling • Cancer Progression

A COLLECTION OF GENE EXPRESSION PANELS DEVELOPED AROUND THE HALLMARKS OF CANCER



**REFERENCE** The Hallmarks of Cancer. Originally published in Cell, 144, Hanahan D & Weinberg RA, Hallmarks of Cancer: The Next Generation, 646–674, Copyright Elsevier 2011.

**The Hallmarks of Cancer** are one of the most widely recognized organizing principles for the holistic study of cancer today. Its profoundly simple framework was first introduced in 2000 by authors Douglas Hanahan and Robert Weinberg and defines a distinct set of acquired capabilities that distinguish cancer from normal tissue. The Hallmarks help explain the complexities of cancer by describing a common set of capabilities present in cancer cells. These processes that, if unstopped, will allow cancer cells to thrive and proliferate in the unique tumor environment they create. This framework, represented in the now famous Hallmarks of Cancer wheel, is often the first roadmap researchers use to study all types of cancer.

## The PanCancer Panels Collection

- **nCounter PanCancer Pathways Panel**  
Understand basic cancer biology and pathway deregulation.
- **nCounter PanCancer Immune Profiling Panel**  
Explore the immune response to cancer.
- **nCounter PanCancer Progression Panel**  
Investigate cancer progression and metastasis.

NanoString has embraced the Hallmarks of Cancer philosophy and shares the vision to bring simplicity to an otherwise extremely complex disease and to enable productive research. Our collection of three nCounter PanCancer Panels delivers a family of multiplex gene expression assays to enable basic and translational research into pathway deregulation studies, the emerging area of immune profiling, and cancer progression.

## Highlights of the PanCancer Panel Collection

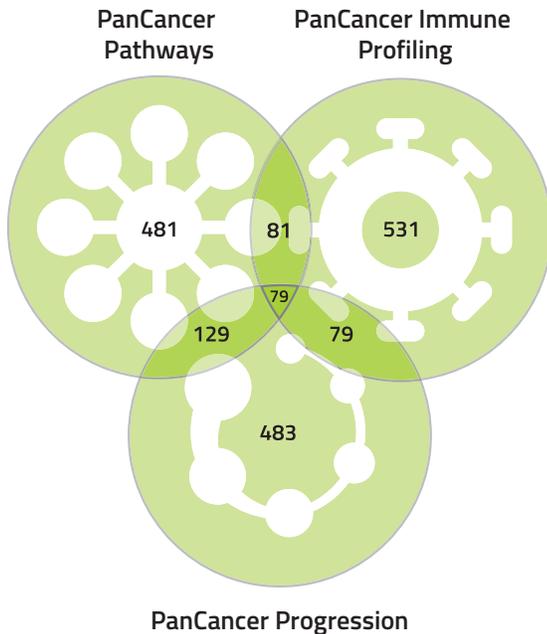
- Comprehensive coverage of all ten Hallmarks of Cancer included in three distinct panels.
- >1,850 unique genes included across all panels.
- Customize with up to 30 additional user-defined genes.
- Compatible with protein panels for multi-omic assays.

## nCounter® PanCancer Panels Collection

Discover Connections • Discover Interactions • Discover Functions

The NanoString PanCancer panels provide researchers with our most highly-multiplexed gene expression panels and represent over 1,850 unique genes. Designed for universal research of any cancer type.

### Overlapping & Unique Content in the PanCancer Panels:



**ABOVE** Human PanCancer Panels Venn diagram with >1,850 unique genes. The genes shared between these panels are members of the PI3K, JAK-STAT, and TGF- pathways, as well as normalization genes.

### PANCANCER PATHWAYS PANEL

770 cancer pathways genes

- 606 pathway genes for 13 canonical pathways
- 124 cancer driver genes
- 40 reference genes
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### PANCANCER IMMUNE PROFILING PANEL

770 cancer immune genes

- 24 different immune cell types
- 30 CT antigens
- > 500 genes covering innate and adaptive immune response
- 40 reference genes

### PANCANCER PROGRESSION PANEL

770 cancer progression genes

- 277 angiogenesis genes
- 269 epithelial-mesenchymal transition genes
- 254 extracellular matrix genes
  - 173 metastasis genes
  - 30 references genes

## RNA:Protein Analysis

Simultaneous analysis of RNA and protein targets enable you to see more from a single sample. Measure both gene expression and cell response from as few as 150,000 cells (up to 500,000 cells for PBMCs and primary cells). The nCounter Protein Plus PanCancer Immune Profiling Panel includes 30 immunology-related protein targets that can be used with any PanCancer Gene Expression Panel.

Protein Panels	Number of Protein Targets
nCounter Protein Plus PanCancer Immune Profiling Panel	30

## nCounter Panel-Plus

Customize PanCancer panels with the optional Panel-Plus feature, and add up to 30 of your preferred genes to create a panel that is uniquely your own.

## Single Cell Analysis

All PanCancer panels are also available in a single cell format. These kits include validated primer pools for multi-target enrichment. Primer pools are provided at no additional charge for the study of single cells or for studies using low input samples.



NanoString offers advanced software tools that address the continuous demands of data analysis and help answer the specific biological questions encompassed in our most popular PanCancer Panels.

**PANCANCER PATHWAYS ADVANCED ANALYSIS MODULE**

- Score pathway deregulation with end-to-end analysis.
- Generate follow-on research hypotheses using pathway visualizations.
- Measure gene expression with 730 essential genes representing all major cancer pathways including: Wnt, Hedgehog, Apoptosis, Cell Cycle, RAS, PI3K, STAT, MAPK, Notch, TGF-, Chromatin Modification, Transcriptional Regulation and DNA Damage Control.

**PANCANCER IMMUNE PROFILING ADVANCED ANALYSIS MODULE**

- Set up wide-ranging exploratory analyses, including estimation of immune cell abundance, detection of CT antigens and differential expression testing in minutes with a simple wizard.
- Measure gene expression with 730 essential genes representing 16 different cancer immune cell types and populations, major immune response categories, and 30 common cancer testis antigens.
- Intuitive step-by-step wizard allows gene sets and cell abundance analysis to be customized.

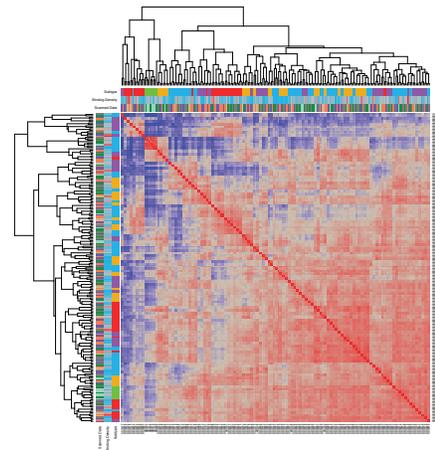
**Advanced Analysis Capabilities:**

- Normalization
- QC
- Pathway scoring (Pathways)
- Differential Expression
- Gene Set Analysis
- Pathview Plot Analysis
- Cell type profiling (Immune Profiling)
- Single Gene Select gene descriptions (Immune Profiling)
- CT Antigen Expression (Immune Profiling)
- Built-in compatibility for Panel Plus analysis

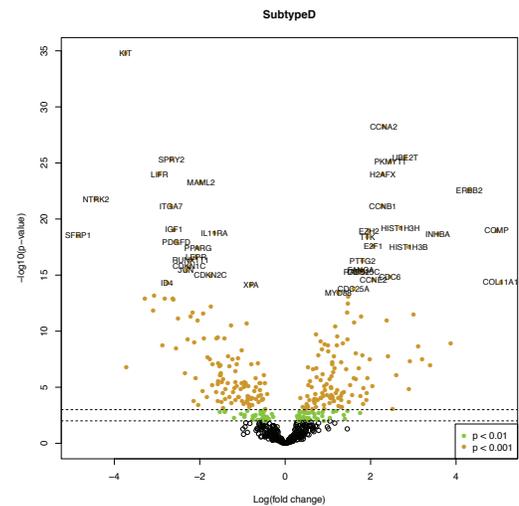
Advanced analysis modules provide an interactive .html report with multiple layers of information along with pathway visualization maps for generating follow-on hypotheses.

To access annotated demo data sets and details on how to use the advanced analysis software please visit:

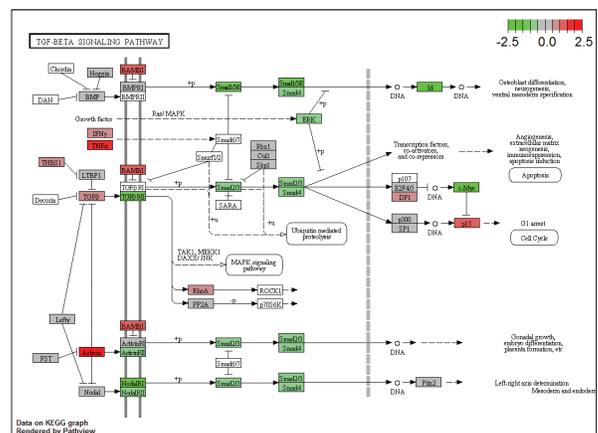
[www.nanosttring.com/products/nSolver](http://www.nanosttring.com/products/nSolver)



**EXAMPLE 1** Heatmap of the samples' correlation matrix. Blue indicates low correlation and red indicates high correlation.



**EXAMPLE 2** Volcano plot of the comparison between two sets of samples (shows fold change vs. log 10 p-value).



**EXAMPLE 3** Pathway plot of differential expression between two sets of samples in the TGF-Beta Pathway. Green indicates down-regulated genes, red indicates up-regulated genes, and grey indicate genes that do not meet the p-value threshold.

## Selecting Your Panel

Fully-annotated gene lists in Excel format are available online for each of the PanCancer panels. All gene lists include the official gene name, accession number, alias, target sequence, and sortable annotations. The table lists some of the major gene categories or pathways along with the panel in which they are best represented.

Category/Pathway	Number of Genes	Panel Name	Representative Hallmarks
Adaptive immunity	104	PanCancer Immune Profiling	Avoiding immune destruction
Angiogenesis	277	PanCancer Progression	Inducing angiogenesis
Cancer driver genes	124	PanCancer Pathways	—
Cell cycle and apoptosis	137	PanCancer Pathways	Resisting cell death
Chromatin modification	22	PanCancer Pathways	Genome instability and mutation
DNA repair	50	PanCancer Pathways	Genome instability and mutation
Epithelial-mesenchymal transition	269	PanCancer Progression	Activating invasion and metastasis
Extracellular matrix	254	PanCancer Progression	Activating invasion and metastasis
Hedgehog pathway	28	PanCancer Pathways	Resisting cell death
Humoral immunity	41	PanCancer Immune Profiling	Avoiding immune destruction
Inflammation	66	PanCancer Immune Profiling	Tumor-promoting inflammation
Innate immunity	200	PanCancer Immune Profiling	Tumor-promoting inflammation
JAK-STAT pathway	86	PanCancer Pathways	Sustaining proliferative signaling
MAPK pathway	157	PanCancer Pathways	Sustaining proliferative signaling
Metastasis	173	PanCancer Progression	Activating invasion and metastasis
Notch pathway	24	PanCancer Pathways	Enabling replicative immortality
PI3K pathway	201	PanCancer Pathways	Deregulating cellular energetics
RAS pathway	142	PanCancer Pathways	Sustaining proliferative signaling
TGF- $\beta$ pathway	51	PanCancer Pathways	Evading growth suppressors
Transcriptional misregulation	101	PanCancer Pathways	Genome instability and mutation
Wnt pathway	78	PanCancer Pathways	Enabling replicative immortality

For gene lists describing the content of each of our PanCancer panels, please visit: [www.nanostring.com/products](http://www.nanostring.com/products)

### NanoString Technologies, Inc.

530 Fairview Ave N  
Seattle, Washington 98109

### CONTACT US

info@nanostring.com  
Tel: (888) 358-6266  
Fax: (206) 378-6288  
[www.nanostring.com](http://www.nanostring.com)

### SALES CONTACTS

United States: [us.sales@nanostring.com](mailto:us.sales@nanostring.com)  
EMEA: [europe.sales@nanostring.com](mailto:europe.sales@nanostring.com)  
Asia Pacific & Japan: [apac.sales@nanostring.com](mailto:apac.sales@nanostring.com)  
Other Regions: [info@nanostring.com](mailto:info@nanostring.com)

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