

# PrimePCR Assays and Panels for Real-Time PCR



# Proven Performance

Real-Time PCR Assays That Go Beyond a Guarantee



Our PrimePCR Gene Expression Assays give you confidence in your real-time PCR results. Each assay is expertly designed and wet-lab validated, and its specificity is verified using next-generation sequencing (NGS) for proven assay performance. Each assay for the human, mouse, and rat genomes was experimentally tested for optimal efficiency, specificity, sensitivity, and linear dynamic range. The assays are available as individual assays, custom plates, and predesigned pathway and disease panels.

## Key Features

Design Feature	Why It's Important
Maximum transcript coverage	Detects the majority of expressed mRNA transcripts for each gene of interest
Intron-spanning assay design when possible	Detects only cDNA and not contaminating genomic DNA (gDNA)
Secondary structure avoided	Secondary structure of cDNA can lead to poor real-time PCR efficiency
Single-nucleotide polymorphisms (SNPs) avoided	SNPs in primer and probe annealing sequences can lead to poor assay efficiency
Specific sequences identified	Avoids coamplification of nonspecific off-target sequences

Validation Feature	Why It's Important
7-point serial dilution	Determines the dynamic range, $R^2$ , and efficiency of the assay
Amplification of gDNA	Determines whether the assay detects contaminating gDNA
Melt curve analysis	Confirms the melt profile of the expected real-time PCR product
Next-generation sequencing	Confirms the specificity of the assay

# Getting Started with PrimePCR: A Four-Step Guide

1

## **Design and Optimize Assays**

For efficient and specific amplification of the product, take care when choosing a target sequence and designing primers and probes. Choose from our set of experimentally validated assays to ensure optimal assay performance.

2

## **Identify More Genes of Interest from Your Samples**

Choose from more than 1,100 predesigned panels spanning diseases, canonical pathways, and biological processes. Assays come preplated with controls and reference genes for easy experiment setup.

3

## **Find the Best Reference Gene(s) for Your Set of Experiments**

Use the PrimePCR Reference Gene Panel and the Reference Gene Selection Tool in PrimePCR Analysis Software to determine the most stable reference gene for your samples.

4

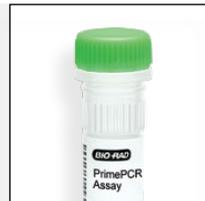
## **Assess the Quality and Performance of Your Real-Time PCR Reactions and Samples**

>>>> Before you start an experiment, make sure your samples and reactions will provide the best possible data. Choose from different types of PrimePCR assay controls to facilitate assessment of key experimental factors impacting your real-time PCR experiment.

# PrimePCR Assays

## Predesigned SYBR® Green Assays

Transcriptome-wide primer assays for SYBR® Green gene expression analysis are available in 200, 1,000, and 2,500 reaction sizes.



## Predesigned Probe Assays

Transcriptome-wide probe assays for gene expression analysis are available in 500, 1,000, and 2,500 reaction sizes.



## lncRNA Assays

SYBR® Green and Probe Assays are optimized for sensitive detection of long noncoding RNA (lncRNA). Predesigned lncRNA Arrays have been curated with highly cited and novel lncRNA for target discovery.



## PreAmp Assays

Primers are available for target-specific preamplification of limited nucleic acid.



## Reference Gene Assays

SYBR® Green and Probe Assays can be used to normalize for variations in input mRNA.



## DNA Templates

Gene-specific synthetic DNA templates are designed to give a positive real-time PCR result when used with the corresponding gene assay.



## Experimental Controls

Control assays can be used to assess reverse transcription, RNA quality, genomic DNA (gDNA) contamination, and PCR performance.



# PrimePCR Arrays and Panels

## Predesigned and Customizable Options to Drive Discovery

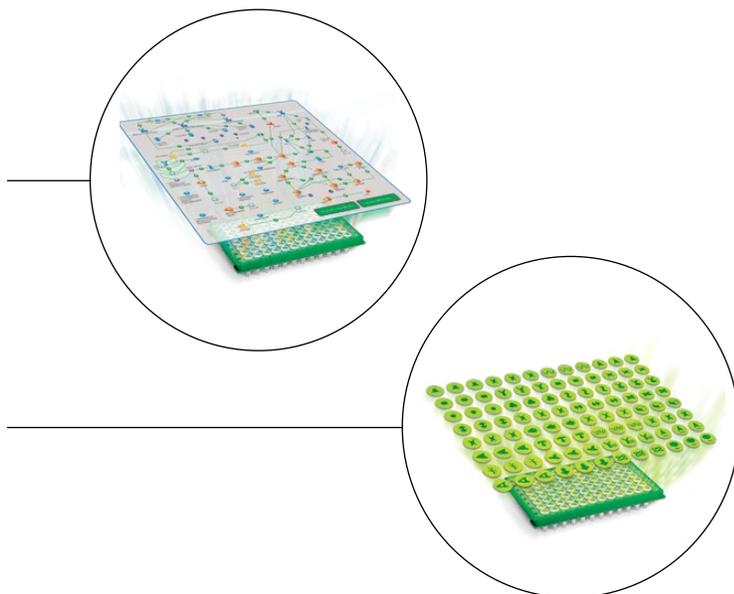
PrimePCR Plates and Arrays simplify gene expression profiling by including lyophilized primers in each plate well. Plates compatible with every major real-time PCR instrument are available. The arrays are also available with PrimePCR Control Assays for results you can trust.

### Predesigned Pathway Plates

Expertly designed arrays are available for a wide range of pathways and disease states. Obtain the gene expression profile of a complete disease pathway in a single experiment.

### Custom PrimePCR Plates

Go from your RNA sample through the data analysis in a single day. Choose from our curated list of targets or design and include your own PCR primers in any custom plate, available in 96- or 384-well format.



## PrimePCR Panels for a Broad Range of Pathways and Disease States



### Diseases

- Bacterial infections and fungal mycoses
- Cancers and neoplasms
- Cardiac hypertrophy
- Cardiovascular diseases
- Congenital, hereditary, and neonatal diseases and abnormalities
- Cystic fibrosis
- Digestive system diseases
- Endocrine system diseases
- Eye diseases
- Female urogenital diseases and pregnancy complications
- Hemic and lymphatic diseases
- Immune system diseases
- Male urogenital diseases
- Mental disorders
- Musculoskeletal diseases
- Nervous system diseases
- Nutritional and metabolic diseases
- Otorhinolaryngologic diseases
- Parasitic diseases
- Pathological conditions, signs, and symptoms
- Respiratory tract diseases
- Skin and connective tissue diseases
- Stomatognathic diseases
- Viral diseases
- Wounds and injuries



### Processes

- Apoptosis and survival
- Blood coagulation
- Cell adhesion
- Cell cycle
- Chemotaxis
- Cytoskeleton remodeling
- Development
- DNA damage
- Hypoxia response
- Immune response
- Muscle contraction
- Neurophysiological process
- Oxidative stress
- Proteolysis
- Reproduction
- Transcription
- Translation
- Transport



### Metabolism

- Amino acid metabolism
- Carbohydrate metabolism
- Lipid metabolism
- Nucleotide metabolism
- Regulation of lipid metabolism
- Regulation of metabolism
- Steroid metabolism
- Vitamin and cofactor metabolism
- Xenobiotic metabolism



### Protein Function

- Cytokines and chemokines
- G proteins
- Growth factors
- Hormones
- Kinases
- Phosphatases
- Second messengers
- Transcription factors

# Real-Time PCR Workflow

1

## Sample Preparation

### Aurum Total RNA Mini Kit

The Aurum Total RNA Mini Kit produces high-quality DNA-free total RNA from a wide range of starting materials, including cultured cells, bacteria, and yeasts, as well as animal and plant tissues.



2

## Reverse Transcription

### iScript Advanced cDNA Synthesis Kit for RT-qPCR

The iScript Advanced cDNA Synthesis Kit for RT-qPCR is a simple, fast, and sensitive first-strand cDNA synthesis kit for gene expression analysis using real-time PCR.



3

## Real-Time PCR Reaction Setup

### PrimePCR Assays

Experimentally validated real-time PCR primer assays are available as individual SYBR® Green and Probe Assays, preplated pathway- and disease-specific panels, and custom-configured plates.



### SsoAdvanced Universal Supermixes

These supermixes are available for SYBR® Green- and probe-based detection chemistries. They are formulated to provide superior inhibitor tolerance, increased speed, and optimal performance with complex target sequences and challenging sample types on any instrument, without affecting real-time PCR sensitivity, efficiency, or reproducibility.



### PCR Plastic Consumables

A large selection of thin-wall polypropylene PCR tubes, PCR plates, sealers, and accessories are precisely manufactured for optimal fit and cycling performance.



4

## Real-Time PCR Run

### Real-Time PCR Detection Systems

Real-time PCR detection systems combine thermal cyclers with optical reaction modules for singleplex and multiplex detection of fluorophores. All systems feature thermal gradient functionality.



5

## Data Analysis

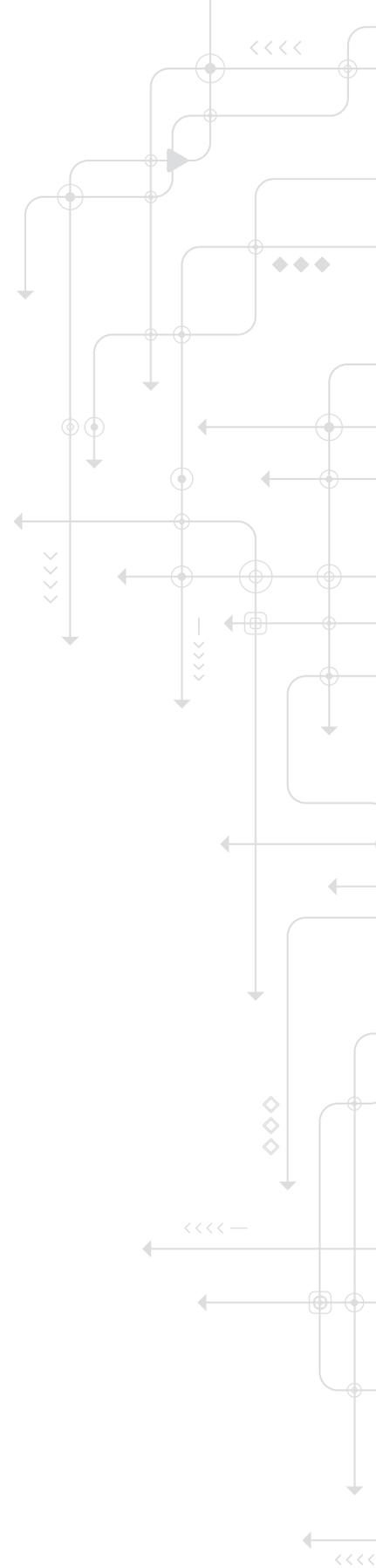
### CFX Manager Software

CFX Manager Software allows for the collection and analysis of real-time data. Data analysis tools include  $\Delta Cq$ ,  $\Delta\Delta Cq$ , bar chart, clustergram, scatter plot, volcano plot, and heat map functions.



### PrimePCR Analysis Software

A stand-alone data analysis tool is available for non-Bio-Rad instruments. Visit [bio-rad.com/PrimePCR](http://bio-rad.com/PrimePCR) to download the software.



# Publications Spotlight

**Cavallero A et al. (2022).** Presence, enzymatic activity, and subcellular localization of paraoxonases 1, 2, and 3 in human lung tissues. *Life Sci* 311, 121147.

Paraoxonases (PON1, PON2, PON3) were identified in lung tissues. PrimePCR Assays were used to evaluate oxidative stress gene expression in respiratory health.

**Narasimhan H et al. (2022).** Tumor necrosis factor- $\alpha$  (TNF $\alpha$ ) stimulates triple-negative breast cancer stem cells to promote intratumoral invasion and neovasculogenesis in the liver of a xenograft model. *Biology (Basel)* 11, 1481.

TNF- $\alpha$  role in breast cancer stem cell invasion was explored. PrimePCR Assays were used to profile TNF pathway genes in tumor microenvironments.

**Sokołowska P et al. (2024).** Endoplasmic reticulum stress differently modulates the release of IL-6 and IL-8 cytokines in human glial cells. *Int J Mol Sci* 25, 8687.

Endoplasmic reticulum stress and cytokine release were examined in glial cells. PrimePCR Assays were used to profile unfolded protein response and inflammation markers.

**Sokołowska G et al. (2025).** Toxicological studies of fungicides frequently detected in drinking water using in vitro biological models. *Desalination and Water Treat* 321, 100997.

Fungicide toxicity in drinking water was assessed. PrimePCR Assays were used to measure expression of stress response and detoxification genes.

**Best LG et al. (2021).** Unactivated leukocyte expression of C-reactive protein is minimal and not dependent on rs1205 genotype. *Sci Rep* 11, 5691.

C-reactive protein (CRP) is a biomarker used to assess inflammatory status in cardiovascular disease and other conditions. PrimePCR Quantitative PCR (qPCR) and Droplet Digital™ PCR (ddPCR™) Assays were employed to detect gene expression of CRP in leukocytes.

Visit [bio-rad.com/PrimePCR](https://bio-rad.com/PrimePCR) to find assays and panels for your gene(s) of interest.

Bio-Rad, ddPCR, Droplet Digital, and Droplet Digital PCR are trademarks of Bio-Rad Laboratories, Inc. in certain jurisdictions. All trademarks used herein are the property of their respective owner. © 2025 Bio-Rad Laboratories, Inc.

SYBR is a trademark of Thermo Fisher Scientific Inc. Bio-Rad Laboratories, Inc. is licensed by Thermo Fisher Scientific Inc. to sell reagents containing SYBR Green I for use in real-time PCR, for research purposes only.

**BIO-RAD**

**Bio-Rad  
Laboratories, Inc.**

Life Science  
Group

Website [bio-rad.com](https://bio-rad.com) USA 1 800 424 6723 Australia 61 2 9914 2800 Austria 00 800 00 24 67 23 Belgium 00 800 00 24 67 23 Brazil 4003 0399  
Canada 1 800 361 1808 China 86 21 6169 8500 Czech Republic 00 800 00 24 67 23 Denmark 00 800 00 24 67 23 Finland 00 800 00 24 67 23  
France 00 800 00 24 67 23 Germany 00 800 00 24 67 23 Hong Kong 852 2789 3300 Hungary 00 800 00 24 67 23 India 91 124 4029300 Israel 0 3 9636050  
Italy 00 800 00 24 67 23 Japan 81 3 6361 7000 Korea 82 080 007 7373 Luxembourg 00 800 00 24 67 23 Mexico 52 555 488 7670  
The Netherlands 00 800 00 24 67 23 New Zealand 64 9 415 2280 Norway 00 800 00 24 67 23 Poland 00 800 00 24 67 23 Portugal 00 800 00 24 67 23  
Russian Federation 00 800 00 24 67 23 Singapore 65 6415 3188 South Africa 00 800 00 24 67 23 Spain 00 800 00 24 67 23 Sweden 00 800 00 24 67 23  
Switzerland 00 800 00 24 67 23 Taiwan 886 2 2578 7189 Thailand 66 2 651 8311 United Arab Emirates 36 1 459 6150 United Kingdom 00 800 00 24 67 23