Life Science Education

Solutions for Teaching Real-Time PCR

Visit explorer.bio-rad.com for more information.

BIO-RAD

PREPARE YOUR STUDENTS FOR THE FUTURE OF BIOTECHNOLOGY

Real-time PCR, also called quantitative PCR (qPCR), allows simultaneous amplification and quantification of a target DNA molecule. It is an extremely powerful technology for not only determining which DNA is present but also how much.

The use of real-time PCR in research and diagnostics is accelerating, as it offers a streamlined, sensitive approach to determining levels of pathogens in tissues and in wastewater, detecting aneuploidies, diagnosing other genetic diseases, and monitoring microbial contaminants in environmental samples, among many other applications. Teaching students this robust technology prepares them for a future in all areas of life science — basic research, biotechnology, medicine, food analysis, diagnostics, and more.

Bio-Rad Can Help

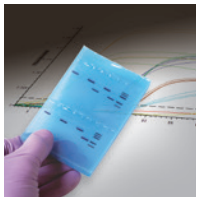
An industry leader in the development of cutting-edge products for biological research and diagnostics, Bio-Rad expresses its commitment to science education through its Explorer program, which offers Bio-Rad products at a discount for use in classroom laboratories. This ensures students learn modern biotechnology techniques like real-time PCR using the same equipment they might someday use in research and diagnostics labs. The Explorer program also partners with teachers and industry experts to develop educational kits and training resources to help you achieve your teaching goals.

Educational Kits for Real-Time PCR

These interactive lab activities involve students in real-world scenarios and provide instruction on the principles and methods of real-time PCR. By examining the effects of pipetting and other variables on sensitivity and accuracy, generating standard curves, and analyzing melt curves, students gain a practical understanding of the unique benefits and applications of both real-time and conventional endpoint PCR.

Crime Scene Investigator PCR Basics Real-Time PCR Starter Kit

An excellent starting point for novices, this kit uses premade DNA samples to teach the basics of real-time PCR. This eliminates the variables associated with DNA extraction and sample preparation.



GMO Real-Time PCR Starter Kit

Teach the entire real-time PCR workflow, from DNA extraction from food items to data analysis, as you quantify the amount of genetically modified ingredients.

Research-Quality Instruments and Software for Real-Time PCR

CFX Real-Time PCR Systems

CFX Real-Time PCR Systems are used in research and diagnostics laboratories around the world. They offer the performance and reliability you expect from Bio-Rad, packaged in sleek, modern instruments that fit well into any classroom laboratory.

The CFX Opus and CFX Duet Systems feature:

- Quick system setup — easy installation and factory-calibrated optics
- Excellent thermal uniformity and accuracy
- Uniform optical system free of regular calibration requirements

	CFX Opus 96 Real-Time PCR System	CFX Opus 384 Real-Time PCR System	CFX Duet Real-Time PCR System
Features	For multiplex qPCR or when wireless connectivity is desired	For multiplex qPCR or when wireless connectivity is desired	For singleplex or duplex qPCR applications when wireless connectivity is not needed
Wells	96	384	96
Multiplex channels	5 plus FRET	4 plus FRET	2 plus FRET
Stand-alone operation	Yes	Yes	No; requires connection to a PC running CFX Maestro Software (not included)
Wireless connectivity	Yes	Yes	No
Reaction volume	1–50 µl	1–30 µl	1–50 µl

FRET, fluorescence resonance energy transfer.

CFX Maestro Software — Real-Time PCR Data Collection, Analysis, and Statistics

Use CFX Maestro Software to set up experiments, select reference genes, perform statistical analyses, and create high-resolution, publication-quality graphs from your results. This software tool is designed to work seamlessly with CFX Opus Systems and is required to run the CFX Duet System.

Work When and Where You Want

Need flexibility? The CFX Opus Systems offer stand-alone operation in addition to Ethernet and wireless network (WiFi) connectivity. Save your data to a USB memory device, connected computer, or networked file folder. You can also program the systems to send your data or any notifications directly to your email or to a local network for easy access from other locations. The CFX Opus Systems also connect to the Bio-Rad BR.io cloud platform, which allows you to set up experiments and retrieve data remotely — your data are stored directly in the cloud, where they can be viewed and analyzed anywhere you have Internet access.

Visit BR.io for more information about the cloud platform.

Have Questions? Need a Quote?

Visit **explorer.bio-rad.com** to learn more about products and resources for educators.
Contact us at **info.bio-rad.com/ExplorerContactUs** with any other questions or to request a quote.

Ordering Information (Educator Discount)

The ordering information listed here is for purchases for **educational use only**.
Visit **bio-rad.com/qPCR** for information on ordering for research use.

Catalog #	Description
Educational Kits for Real-Time PCR	
1662660EDU	**Crime Scene Investigator PCR Basics Real-Time PCR Starter Kit**, contains sufficient materials for 8 student workstations (2–4 students per workstation)
1662560EDU	**GMO Real-Time PCR Starter Kit**, contains sufficient materials for 8 student workstations (2–4 students per workstation)
CFX Real-Time PCR Systems	
12016265EDU	**CFX Duet Real-Time PCR System**, includes power cord, USB cable. Order CFX Maestro Software separately
12011319EDU	**CFX Opus 96 Real-Time PCR System**, includes CFX Opus 96 System and communication cables. Order CFX Maestro Software separately
12011452EDU	**CFX Opus 384 Real-Time PCR System**, includes CFX Opus 384 System and communication cables. Order CFX Maestro Software separately
12013346EDU	**CFX Opus WiFi Adapter**, enables WiFi connection for CFX Opus Systems in North America and other specific countries
CFX Maestro Software	
12013758EDU	**CFX Maestro Software Version 2.3**, compatible with Windows 7 and 10, includes USB installation drive, video quick guides, PDF instruction manual, license for qbase+ Software
PX1 PCR Plate Sealer	
1814000EDU	**PX1 PCR Plate Sealer**, includes heat sealing instrument, plate support block that holds 96-well and 384-well plates, sealing frame, power cord
1814040EDU	**PCR Plate Heat Seal**, foil, pierceable, 1 pkg of 100, foil seals for use with PX1 PCR Plate Sealer
HSP9601EDU	**Hard-Shell™ 96-Well PCR Plates**, pkg of 50, low profile, thin wall, skirted, rigid, white shell/clear well, 2-component design
MSB1001EDU	**Microseal™ 'B' Adhesive Seals,** pkg of 100, optically clear seal for PCR plates used in PCR and real-time PCR reactions
Reagents for Real-Time PCR	
1708880EDU	**iQ SYBR® Green Supermix**, 2.5 ml (2 x 1.25 ml), 2x qPCR mix, contains dNTPs, iTaq DNA Polymerase, $MgCl_2$, SYBR® Green I, enhancers, stabilizers, fluorescein; for 100 x 50 µl reactions
1725270EDU	**SsoAdvanced Universal SYBR® Green Supermix**, 2 ml (2 x 1 ml), 2x qPCR mix, contains dNTPs, Sso7d fusion polymerase, $MgCl_2$, SYBR® Green I, ROX normalization dyes; for 200 x 20 µl reactions

Catalog #	Description
Reagents for Real-Time PCR (cont.)	
1725271EDU	**SsoAdvanced Universal SYBR® Green Supermix**, 5 ml (5 x 1 ml), 2x qPCR mix, contains dNTPs, Sso7d fusion polymerase, $MgCl_2$, SYBR® Green I, ROX normalization dyes; for 500 x 20 µl reactions
1725280EDU	**SsoAdvanced Universal Probes Supermix**, 2 ml (2 x 1 ml), 2x qPCR mix, contains dNTPs, Sso7d fusion polymerase, $MgCl_2$, stabilizers, ROX normalization dyes; for 200 x 20 µl reactions
1725281EDU	**SsoAdvanced Universal Probes Supermix**, 5 ml (5 x 1 ml), 2x qPCR mix, contains dNTPs, Sso7d fusion polymerase, $MgCl_2$, stabilizers, ROX normalization dyes; for 500 x 20 µl reactions
1725282EDU	**SsoAdvanced Universal Probes Supermix**, 10 ml (10 x 1 ml), 2x qPCR mix, contains dNTPs, Sso7d fusion polymerase, $MgCl_2$, stabilizers, ROX normalization dyes; for 1,000 x 20 µl reactions
Reagents for Reverse Transcription and One-Step RT-qPCR	
1708890EDU	**iScript cDNA Synthesis Kit**, includes 5x reverse-transcription reaction mix, iScript reverse transcriptase, nuclease-free water; for 25 x 20 µl reactions
1708891EDU	**iScript cDNA Synthesis Kit**, includes 5x reverse-transcription reaction mix, iScript reverse transcriptase, nuclease-free water; for 100 x 20 µl reactions
1708896EDU	**iScript Select cDNA Synthesis Kit**, includes 5x reaction mix, iScript reverse transcriptase, oligo(dT), random primer mix, gene-specific primer enhancer solution, nuclease-free water; for 25 x 20 µl reactions
1708840EDU	**iScript Reverse Transcription Supermix**, 100 µl 5x supermix, contains reverse transcriptase, RNase inhibitor, dNTPs, primers, $MgCl_2$, stabilizers; 50 reactions of no-RT control supermix; for 25 x 20 µl reactions
1708898EDU	**iScript RT-qPCR Sample Preparation Reagent**, 10 ml, contains RNA stabilizers; for 100 reactions
1725034EDU	**iScript gDNA Clear cDNA Synthesis Kit**, 25 x 20 µl reactions, 100 µl 5x supermix, contains reverse transcriptase, RNase inhibitor, dNTPs, primers, $MgCl_2$, stabilizers; 200 µl no-RT control supermix; 12.5 µl DNase; 150 µl DNase buffer
12010176EDU	**Reliance One-Step Multiplex RT-qPCR Supermix**, 1 ml (1 x 1 ml vial), 4x one-step RT-qPCR supermix, contains Reliance Reverse Transcriptase, blend of high-performance DNA polymerases including Sso7d fusion polymerase, universal reference dye, stabilizer, and reaction buffer; for 200 x 20 µl reactions

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