Real time quantitative PCR (qPCR) technology has revolutionized almost all areas of microbiology including clinical microbiology, food microbiology, industrial microbiology, environmental microbiology and microbial biotechnology. Various modifications and improvements have enhanced the overall performance of this highly versatile technology and the qPCR instrumentation and strategies currently available are more sensitive, faster and affordable than ever before.

Written by experts in the field and aimed specifically at microbiologists, this volume describes and explains the most important aspects of current qPCR strategies, instrumentation and software. Renowned authors cover the application of qPCR technology in various areas of applied microbiology and comment on future trends. Topics covered include instrumentation, fluorescent chemistries, quantification strategies, data analysis software, environmental microbiology, water microbiology, food microbiology, gene expression studies, validation of microbial microarray data and future trends in qPCR technology.

The editor and authors have produced an outstanding book that will be invaluable for all microbiologists. A recommended book for all microbiology laboratories.

Chapter 1. An Introduction to the Real-time Polymerase Chain Reaction (qPCR). Stephen A Bustin, Sara Zaccara and Tania Nolan
Chapter 2. Instrumentation and Fluorescent Chemistries Used in qPCR. Mathilde H. Jøsølsen, Charlotte Løfström, Trine Hansen, Eyjólfur Reynisson and Jeffrey Hoofar
Chapter 3. Quantification Strategies in Real-time RT-PCR (RT-qPCR). Michael W. Pfaffl
Chapter 4. Genex: Data Analysis Software. Mikael Kubista, Vendula Rusnakova, David Svec, Björn Sjögren and Ales Tichopad
Chapter 5. Quantification of Microorganisms Targeting Conserved Genes in Complex Environmental Samples Using qPCR. Claudia Goyer and Catherine E. Dandie
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Real-time PCR is an extremely important technology, useful not only in food analysis, but also in gene expression analysis and many other applications in which the goal is not only to ask "what DNA is present" but also "how much". The Bio-Rad GMO Investigator kit is a popular tool for demonstrating PCR in the classroom. To teach the basics of real-time PCR in the classroom with the GMO Investigator kit, simply substitute the Taq polymerase master mix with iQ<sup>®</sup> SYBR<sup>®</sup> Green supermix, use strip tubes and optical flat caps, and amplify the reactions on a real-time Bio-Rad PCR instrument such as the MiniOpticon<sup>®</sup>. Although the GMO Investigator kit was developed for conventional. Real-time polymerase chain reaction allows researchers to estimate the quantity of starting material in a sample. It has a much wider dynamic range of analysis than conventional PCR. Quantitative real-time PCR can be readily applied to analysis of gDNA targets. Such studies may be genotyping/SNP determination, methylation analysis, screening transgenic sequences, or monitoring of insertions and deletions. Quantification and Analysis of mRNA Transcripts. A common application of qPCR is gene expression analysis, e.g., comparing the mRNA concentrations of a gene of interest between control and treated samples. Applied and Environmental Microbiology. Clinical Microbiology Reviews. Clinical and Vaccine Immunology. Quantitative PCR assays. PCR amplification was performed in 25-μl final volumes containing 5 μl of DNA or cDNA template, 0.2 μM of each respective primer, and 12.5 μl of SybrGreen Master Mix (Applied Biosystems). All the amplifications were carried out in optical-grade 96-well plates on an ABI Prism 5700 sequence detection system (Applied Biosystems) with an initial step at 95°C for 10 min followed by 40 cycles of 95°C for 15 s, 60°C for 1 min, and 72°C for 30 s. The CT was determined automatically by the instrument. Real-time PCR (QPCR) is a suitable technique that has been applied in the last few years to detect and quantify microorganisms associated with food.