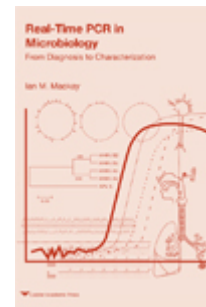


# Real-Time PCR in Microbiology From Diagnosis to Characterization



*Edited by: Ian M. Mackay*

*Sir Albert Sakzewski Virus Research Centre, Queensland, Australia*

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Real-time PCR has established itself as a sensitive and specific qualitative and quantitative technique that has become important to all areas of microbiology. This invaluable book describes and explains some of the more complex aspects of real-time PCR presenting a background for the novice, a theoretical reference for the experienced user, and useful discussions of future developments. Chapters address the basics of PCR history, oligonucleotide design, target preparation, standardisation, quantification, various applications, and future challenges. The final chapter is presented in the format of a roundtable discussion providing an insightful, topical and interesting discourse with contributions from over 30 authorities and experts on real-time PCR.

The editor and authors have produced an excellent book that will be extremely useful for all microbiologists. A recommended book for all microbiology laboratories.

**Chapter 1.** Real-Time PCR: History and Fluorogenic Chemistries. *Ian M. Mackay, John F. Mackay, Michael D. Nissen, and Theo P. Sloots*

**Chapter 2.** Oligonucleotide Design for In-House Real-Time PCR Applications in Microbiology. *Andreas Nitsche*

**Chapter 3.** QPCR: Target Preparation. *Tania Nolan, Reinhold Mueller and Stephen Bustin*

**Chapter 4.** Standards and Controls: Concepts for Preparation and Use in Real-Time PCR Applications. *Amy Muska, Edith Peck and Stuart Palmer*

**Chapter 5.** Quantification of Micro-Organisms: Not Human, Not Simple, Not Quick. *Ian M. Mackay, Stephen A. Bustin, José Manuel Andrade, Mikael Kubista and Theo P Sloots*

**Chapter 6.** Multiplex rtPCR in Microbiology. *Nick M. Cirino, Norma P. Tavakoli, Susan Madison-Antenucci and Christina Egan*

**Chapter 7.** The Role of Real-time PCR in Routine Microbial Diagnostics. *Eric C.J. Claas, Willem J.G. Melchers and Adriaan J.C. van den Brule*

**Chapter 8.** Challenges Facing Real-Time PCR Characterization of Acute Respiratory Tract Infections. *Ian M. Mackay, Katherine E. Arden, Michael D. Nissen and Theo P Sloots*

**Chapter 9.** Rapid Detection of Bioterror Agents. *Andreas Nitsche*

**Chapter 10.** Experts Roundtable: Real-Time PCR and Microbiology. *M.G.H.M. Beld, C. Birch, P.A. Cane, W. Carman, E.C.J. Claas, J.P. Clewley, E. Domingo, J. Druce, C. Escarmis, R.A.M. Fouchier, V. Foulongne, M.G. Ison, L.C. Jennings, B. Kaltenboeck, I.D. Kay, M. Kubista, O. Landt, I.M. Mackay, J. Mackay, H.G.M. Niesters, M.D. Nissen, S. Palladino, N.G. Papadopoulos, A. Petrich, M.W. Pfaffl, W. Rawlinson, U. Reischl, N.A. Saunders, C. Savolainen-Kopra, O. Schildgen, G.M. Scott, M. Segondy, R. Seibl, T.P. Sloots, Y-W. Tang, R. Tellier and P.C.Y. Woo*

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Real-time PCR has catalysed wider acceptance of PCR because it is more rapid, sensitive and reproducible, while the risk of carryover contamination is minimised. There is an increasing number of chemistries which are used to detect PCR products as they accumulate within a closed reaction vessel during real-time PCR. These include the non-specific DNA-binding fluorophores and the specific, fluorophore-labelled oligonucleotide probes, some of which will be discussed in detail. It is not only the technology that has changed with the introduction of real-time PCR. Accompanying changes have occurred (2008) A real-time polymerase chain reaction for the detection of *Streptococcus pneumoniae* in blood using a mouse model: a potential new "gold standard". *Diagn Microbiol Infect Dis* 62(1):23-25 PubMedCrossRefGoogle Scholar. 68. Book M., Lehmann L.E., Zhang X.H., Stueber F. (2009) Real-Time PCR in Microbiology: From Diagnosis to Characterization. In: Rello J., D'Az E., Rodríguez A. (eds) Management of Sepsis: The PIRO Approach. Springer, Berlin, Heidelberg. Real-time PCR has established itself as a sensitive and specific qualitative and quantitative technique that has become important to all areas of microbiology. This invaluable book describes and explains some of the more complex aspects of real-time PCR presenting a background for the novice, a theoretical reference for the experienced user, and useful discussions of future developments. Chapters address the basics of PCR history, oligonucleotide design, target preparation, standardisation, quantification, various applications, and future challenges. The final chapter is presented in the form