Contents

Part I DNA Analysis: Current Issues

1 Genetic Analyses in Health Laboratories: Current Status and Expectations	3
Alessia Finotti, Giulia Breveglieri, Monica Borgatti, and Roberto Gambari	
2 DNA Analyses in Food Safety and Quality: Current Status and Expectations	25
Rosangela Marchelli, Tullia Tedeschi, and Alessandro Tonelli	

Part II Advanced Materials for Ultrasensitive Analysis

3 Engineered Nanostructures for the Ultrasensitive DNA Detection ...	67
Dong-Kwon Lim, Amit Kumar, and Jwa-Min Nam	
4 Advanced Molecular Probes for Sequence-Specific DNA Recognition	89
Alessandro Bertucci, Alex Manicardi, and Roberto Corradini	
5 Charged Conjugated Polymers	125
Fengting Lv and Shu Wang	

Part III Detection Strategies – Sensors

6 Optical Detection of Non-amplified Genomic DNA	153
Di Li and Chunhai Fan	
7 Electrochemical Detection of DNA Using Nanomaterials Based Sensors	185
Sergio Marín and Arben Merkoçi	
8 Piezoelectric Sensing for Sensitive Detection of DNA	203
Maria Minunni	

9	Surface Plasmon Resonance-Based Methods	235
	Roberta D'Agata and Giuseppe Spoto	
10	Parallel Optical and Electrochemical DNA Detection	263
	Wolfgang Knoll, Jianyun Liu, Lifang Niu, Peter Eigil Nielsen, and Louis Tiefenauer	
Part IV Detection Strategies – Sequencing		
11	Recent Advances in Sequencing Technology	281
	John F. Thompson, Fatih Ozsolak, and Patrice M. Milos	
	Index	309