# Contents

Contributors ..... ix
Preface ..... xiii

1. *In Situ* Hybridization Methods to Study Microbial Populations and Their Interactions with Human Host Cells ..... 1
*R Holm*

2. Fluorescent Protein Probes in Fungi ..... 27
*KJ Czymmek, TM Bourett and RJ Howard*

3. Live-cell Imaging of Filamentous Fungi Using Vital Fluorescent Dyes and Confocal Microscopy ..... 63
*PC Hickey, SR Swift, MG Roca and ND Read*

4. One-photon versus Two-photon Laser Scanning Microscopy and Digital Image Analysis of Microbial Biofilms ..... 89
*TR Neu and JR Lawrence*

5. Applications of Cryo- and Transmission Electron Microscopy in the Study of Microbial Macromolecular Structure and Bacterial-Host Cell Interactions ..... 137
*MI Fernandez, M-C Prevost, PJ Sansonetti and G Griffiths*

6. Microbial Surfaces Investigated Using Atomic Force Microscopy ..... 163
*YF Dufrêne and DJ Müller*

7. Positron Emission Tomography Imaging of Clinical Infectious Diseases ..... 199
*C Van de Wiele, O De Winter, H Ham and R Dierckx*

8. Biosensor Characterization of Structure-Function Relationships in Viral Proteins ..... 213
*L Choulier, D Altschuh, G Zeder-Lutz and MHV Van Regenmortel*

9. RT *In Situ* PCR: Protocols and Applications ..... 239
*AF Nicol and GJ Nuovo*

10. Real-Time Fluorescent PCR Techniques to Study Microbial-Host Interactions ..... 255
*IM Mackay, KE Arden and A Nitsche*

11. Design and Use of Functional Gene Microarrays (FGAs) for the Characterization of Microbial Communities . . . . . 
*CW Schadt, J Liebich, SC Chong, TJ Gentry, Z He, H Pan and J Zhou*

Index . . . . . 