

Contents

Contributors, viii

Preface to the first edition, x

Preface to the second edition, xi

Part 1: Evolution of biological concepts

- 1 Biological basis of orthodontic tooth movement: An historical perspective, 3
Ze'ev Davidovitch and Vinod Krishnan
- 2 Biology of orthodontic tooth movement: The evolution of hypotheses and concepts, 15
Vinod Krishnan and Ze'ev Davidovitch
- 3 Cellular and molecular biology behind orthodontic tooth movement, 30
Vinod Krishnan, Rodrigo F. Viegelli, and Ze'ev Davidovitch

Part 2: Mechanics meets biology

- 4 The effects of mechanical loading on hard and soft tissues and cells, 53
Itzhak Binderman, Lital Young, Hila Bahar, Nasser Gadban, and Avinoam Yaffe
- 5 Biological aspects of bone growth and metabolism in orthodontics, 62
Song Chen, James K. Hartsfield, Jr., and W. Eugene Roberts
- 6 Mechanical load, sex hormones, and bone modeling, 82
Sara H. Windahl and Ulf H. Lerner
- 7 Biological reactions to temporary anchorage devices, 97
Gang Wu, Jing Guo, Haikun Hu, and Vincent Everts

Part 3: Inflammation and tooth-moving orthodontic forces

- 8 Oral and periodontal microbiology and orthodontic treatment: Changes, effects, and alterations, 111
Ellen Ghijssels, Carine Carels, and Jan van Gastel
- 9 The role of inflammation in defining the type and pattern of tissue response in orthodontic tooth movement, 121
Masaru Yamaguchi and Gustavo Pompermaier Garlet
- 10 Markers of paradental tissue remodeling in the gingival crevicular fluid and saliva of orthodontic patients, 138
Laura R. Iwasaki

Part 4: Personalized diagnosis and treatment based upon genomic criteria

- 11 Genetic influences on orthodontic tooth movement, 147
Maggie Zeichner-David
- 12 Personalized orthodontics: Limitations and possibilities in orthodontic practice, 164
James K. Hartsfield, Jr.
- 13 The effect of drugs and diet on orthodontic tooth movement, 173
Vinod Krishnan, James J. Zahrowski, and Ze'ev Davidovitch

Part 5: Rapid orthodontics

- 14 Biologic orthodontics: Methods to accelerate or decelerate orthodontic tooth movement, 191
Vinod Krishnan and Ze'ev Davidovitch
- 15 Corticotomy and postmodern incarnations of surgically facilitated orthodontic therapy (SFOT), 210
Neal C. Murphy, William M. Wilcko, and Nabil F. Bissada

Part 6: Long-term effects of tooth-moving forces

- 16 Mechanical and biological determinants of iatrogenic injuries in orthodontics, 231
Vinod Krishnan and Ze'ev Davidovitch
- 17 The biological background of relapse of orthodontic tooth movement, 248
Jaap C. Maltha, Vaska Vandevska-Radunovic, and Anne Marie Kuijpers-Jagtman

Part 7: Tooth-movement research

- 18 Controversies in tooth-movement research, 263
Vinod Krishnan and Ze'ev Davidovitch
- 19 Planning and executing tooth-movement research, 279
Ze'ev Davidovitch, Rajesh Ramachandran, and Vinod Krishnan

Index, 295