Contents

1. Ophthalmic Pharmaceuticals: New Formulations **1**

Rocío Herrero-Vanrell

Bioavailability of Ophthalmic Formulations and Routes of Administration *2*
Ophthalmic Topical Formulations *4*
Intraocular Formulations *6*
Novel Formulations of Ocular Administration *7*

2. Topical Anesthetics **11**

Ricardo Cuiña Sardiña, José Manuel Benítez-del-Castillo, David Díaz-Valle, José Antonio Gegúndez-Fernández

History *11*
Local Anesthetics *12*
Factors Affecting the Quality of the Anesthesia *13*
Anesthetic Agents *13*
Choice of Types of Anesthesia *17*

3. Ocular Surface Dyes **20**

Jaime Etxebarria

How to Grade Corneal and Conjunctival Staining? *20*
Fluorescein *21*
Rose Bengal *29*
Lissamine Green *37*
Sulforhodamine B *44*

4. Mydriatics and Cycloplegics **51**

Pedro Arriola-Villalobos

Indications *51*
Contraindications Cautions *53*
Side Adverse Effects *53*
Mydriatics *53*
Cycloplegics *54*

5. Commercially Available Topical Antibiotics **59**

José Antonio Gegúndez-Fernández, Laura Morales-Fernández, David Díaz-Valle, José Manuel Benítez-del-Castillo

Classification According to Mechanism of Action *64*

6. Topical Fortified Antibiotics, Intravitreal and Subconjunctival Antibiotics **77**

David Díaz-Valle, José Manuel Benítez-del-Castillo, José Antonio Gegúndez-Fernández

Topical Fortified Antibiotics *80*
Subconjunctival Route *85*
Intrastromal and Intracameral Antibiotics *85*
Intravitreal Antibiotics *87*

7. Systemic Antibiotics with Ophthalmic Clinical Usefulness **91**

Ignacio Rodriguez-Uña, Paula Bañeros-Rojas, Carlos Cólliga Jiménez, David Díaz-Valle, José Antonio Gegúndez-Fernández, José Manuel Benitez-del-Castillo

Beta-Lactams *92*
Carbapenems *95*
Glycopeptides *96*
Aminoglycosides *96*
Tetracyclines *97*
Macrolides *98*
Oxazolidinones *99*
Quinolones *100*
Treatment of Infectious Uveitis *100*

8. Antivirals **109**

Clara Berrozpe-Villabona, Paula Bañeros-Rojas, David Díaz-Valle, José Antonio Gegúndez-Fernández, José Manuel Benítez-del-Castillo

Antiviral Drugs *110*

9. Antifungals **128**

Elisa González Pastor, José Antonio Gegúndez-Fernández, David Díaz-Valle, José Manuel Benítez-del-Castillo

Polyenes *130*
Azoles *132*
Echinocandins *135*
Others *138*

10. Antiparasitic Drugs **141**

Juan J Pérez-Santonja, Ruben Cabrera-Beyrouti, Diana N Jiménez-Rodríguez, José L Pérez-Canales

Antiprotozoal Drugs *141*
Anthelmintic Drugs *144*
Compounds Against Arthropods *148*
Treatment of Parasitic Diseases Involving the Eye *148*

11. Steroids 161
Rosalía Méndez Fernández, Elisa González Pastor, Paula Arribas Pardo
Mechanism of Action *161*
Main Steroids *162*
Routes of Administration in Ophthalmology *162*
Side Effects *167*

12. Nonsteroidal Anti-inflammatory Drugs 175
José Antonio Gegúndez-Fernández, Elisa González Pastor, José Manuel Benítez-del-Castillo, David Díaz-Valle
Adverse Effects of Topical Ophthalmic NSAIDs *183*

13. Other Anti-inflammatory Drugs 187
José Manuel Benitez-del-Castillo, José Antonio Gegúndez-Fernández, David Díaz-Valle
Essential Fatty Acids *187*
Tetracycline Analogs and Other Antibiotics *189*
Topical Calcineurin Inhibitors *190*
Other Future Anti-inflammatory Drugs *193*

14. Immunosuppressants 198
Esperanza Pato, Ana Belén Rodríguez Cambrón
Immunosuppressants *199*

15. Biologics 216
Mª Mar Esteban-Ortega, Santiago Muñoz-Fernández
Anti-TNF-α Therapies *219*
Anti-IL-1 Therapies *223*
Anti-IL-2 Therapies *223*
Anti-IL-6 Therapies *224*
Anti-IL-17 Therapies *224*
Cell Therapy: Rituximab *224*
Costimulation Inhibitor: Abatacept *225*
Other Therapies *225*

16. Intravitreal Implants 231
Alex Fonollosa
Intravitreal Implants on the Market *232*
Investigational Implants *236*

17. Medical Treatment of Glaucoma: Antiglaucoma Drugs 240
José María Martínez de la Casa, Julian Garcia Feijoo
Treatment Options *240*

18. Antiangiogenics 264
Ana Boto de los Bueis, Pino Cidad Betegón
Vessels in the Developing and the Adult Human Cornea 264
Corneal Angiogenesis 264
Indications for Anti (Lymph) Angiogenic Treatment Strategies in Corneal and Ocular Surface Diseases 265
Anti (Lymph) Angiogenic Treatment Strategies in Corneal and Ocular Surface Diseases 266
Future Investigations 271

19. Ophthalmologic Therapy with Botulinum Toxin 279
Laura Valcarce Rial, Rosario Gómez de Liaño Sánchez
Mechanism of Action 280
Injection Techniques 281
Therapeutic Indications 286
Contraindications 290
Adverse Side Effects 290
Presentations 293

20. Dietetics: Vitamins, Antioxidants and Others 295
Nicolás Alejandre-Alba, Guillermo Fernández-Sanz
Vitamin A 295
Carotenoids 296
Zinc 298
Omega-3 and Omega-6 Fatty Acids 298
Curcumin 299
Citicoline 300
N-acetylcysteine 300
Ginkgo Biloba Extract 300
Vitamin C 301
Vitamin B_1 301
Vitamin B_2 301
Vitamin B_3 302
Vitamin B_6 302
Vitamin B_{12} 302
Vitamin E 302
Selenium 303
L-Arginine 303
Coenzyme Q_{10} 303
L-Carnitine 304
Resveratrol 304

21. Antiallergics 312
David J Galarreta
Early- and Late-phase Reaction: Understanding Targets of Treatment 312
Treatment of Allergic Eye Disease 315

22. Tear Substitutes 335
José Manuel Benítez-del-Castillo, David Díaz-Valle, José Antonio Gegúndez-Fernández
Tear Substitutes 335
Types, Characteristics and Composition of Tear Substitutes 336
Future Trends in Dry Eye Disease Treatment 341

23. Surgical Use Drugs 348
Javier Celis-Sánchez, Javier Gálvez Martínez, Laura Alfaya Muñoz, Eva Avendaño Cantos, Fernando González-del Valle
Lidocaine 348
Adrenaline 348
Phenylephrine 348
Acetylcholine 349
Cefuroxime 349
Vancomycin 350
Intraocular Irrigating Solutions 350
Vitreous Substitutes 351
Viscoelastics 354
Vital Dyes for Intraocular Surgery 358
Adhesives 363

24. Eyelid Hygiene Products: Treatment of Blepharitis and Meibomian Gland Dysfunction 371
Bermúdez-Vallecilla MC, David Díaz-Valle, José Antonio Gegúndez-Fernández, José Manuel Benítez-del-Castillo
Ocular Surface Diseases Associated with Eyelid Hygiene 371
Importance of Eyelid Hygiene 372
Eyelid Hygiene Products 373
Main Components in Eyelid Hygiene Products 373

25. Ocular Adverse Reactions of Systemic Drugs 382
Enrique Santos-Bueso, José Manuel Benitez-del-Castillo
Therapeutic Groups of Drugs with Ocular Adverse Effect 383
Ocular Adverse Effect with Other Drugs 391

26. Ocular Adverse Events of Topical Drugs **396**

Juan Cano-Parra, Joan Felip-Funes

Contact Allergic Blepharoconjunctivitis *397*
Hypertrichosis of the Eyelashes *400*
Ocular Sicca Disease and Preservatives *401*
Ocular Surface Findings *403*
Uveitis *404*

Index *409*