

---

# Contents

## Part I General Overview

<b>1 History of Drug-Resistant Microbes .....</b>	<b>3</b>
George A. Jacoby	
<b>2 Evolutionary Biology of Drug Resistance .....</b>	<b>9</b>
Fernando Baquero and Rafael Cantón	
<b>3 Pharmacology of Drug Resistance.....</b>	<b>37</b>
Elizabeth R. Andrews and Angela Kashuba	
<b>4 Drug Development for Drug-Resistant Pathogens.....</b>	<b>45</b>
Jacques Dumas, Michael J. Pucci, and Greg Moeck	

## Part II General Mechanisms of Drug Resistance

<b>5 Genetic Mechanisms of Transfer of Drug Resistance .....</b>	<b>61</b>
Paul H. Roy and Sally R. Partridge	
<b>6 Mutations as a Basis of Antimicrobial Resistance.....</b>	<b>77</b>
Robert A. Bonomo	
<b>7 Target-Mediated Antibacterial Resistance .....</b>	<b>89</b>
Liza Valdivia and Louis B. Rice	
<b>8 Biochemical Logic of Antibiotic Inactivation and Modification .....</b>	<b>97</b>
Vanessa M. D'Costa and Gerard D. Wright	
<b>9 Antibiotic Resistance due to Reduced Uptake.....</b>	<b>115</b>
Lucía Fernández, Joseph B. McPhee, Sandeep Tamber, Michelle D. Brazas, Shawn Lewenza, and Robert E.W. Hancock	
<b>10 Active Efflux as a Mechanism of Resistance to Antimicrobial Drugs .....</b>	<b>131</b>
Xian-Zhi Li	
<b>11 The Functional Resistance of Biofilms .....</b>	<b>149</b>
Elias K. Manavathu and Jose A. Vazquez	

## Part III Bacterial Drug Resistance: Mechanisms

<b>12 The Importance of <math>\beta</math>-Lactamases to the Development of New <math>\beta</math>-Lactams .....</b>	<b>165</b>
Karen Bush	
<b>13 Penicillin-Binding Proteins and <math>\beta</math>-Lactam Resistance .....</b>	<b>177</b>
André Zapun, Pauline Macheboeuf, and Thierry Vernet	

<b>14</b>	<b>Aminoglycosides: Mechanisms of Action and Resistance</b> .....	213
	Alisa W. Serio, Maria L. Magalhães, John S. Blanchard, and Lynn E. Connolly	
<b>15</b>	<b>Tetracycline and Chloramphenicol Resistance Mechanisms</b> .....	231
	Marilyn C. Roberts and Stefan Schwarz	
<b>16</b>	<b>Fluoroquinolone Resistance in Bacteria</b> .....	245
	Bryan D. Schindler, Joseph Adrian L. Buensalido, and Glenn W. Kaatz	
<b>17</b>	<b>Plasmid-Mediated Quinolone Resistance</b> .....	265
	George A. Jacoby	
<b>18</b>	<b>Resistance to Macrolides, Lincosamides, and Streptogramins</b> .....	269
	Vincent Cattoir and Roland Leclercq	
<b>19</b>	<b>Mechanisms of Resistance in Metronidazole</b> .....	281
	Shira I. Doron, Kirthana R. Beaulac, Abhay Dhand, and David R. Snyderman	
<b>20</b>	<b>Glycopeptide-Resistance in Enterococci</b> .....	289
	Florence Depardieu and Patrice M. Courvalin	
<b>21</b>	<b>Daptomycin Resistance</b> .....	307
	Jordan R. Smith, Kimberly C. Claeys, Evan J. Zasowski, Juwon Yim, and Michael J. Rybak	
<b>22</b>	<b>Resistance to Linezolid</b> .....	319
	Eleni Ntokou and Birte Vester	
<b>23</b>	<b>Mechanism of the Antibacterial Activity and Resistance of Polymyxins</b> .....	333
	Matthew D. Johnson, Roger L. Nation, and Jian Li	
<b>24</b>	<b>Sulfonamides and Trimethoprim</b> .....	345
	Ola E. Sköld and Göte Swedberg	
<b>25</b>	<b>Mechanisms of Action and Resistance of the Antimycobacterial Agents</b> .....	359
	Noton K. Dutta and Petros C. Karakousis	

#### Part IV Fungal Drug Resistance: Mechanisms

<b>26</b>	<b>Amphotericin B: Polyene Resistance Mechanisms</b> .....	387
	Matthew McCarthy, Elizabeth M. O'Shaughnessy, and Thomas J. Walsh	
<b>27</b>	<b>Fungal Drug Resistance: Azoles</b> .....	397
	Jose L. Lopez-Ribot, Nathan P. Wiederhold, and Thomas F. Patterson	
<b>28</b>	<b>Flucytosine Treatment and Resistance Mechanisms</b> .....	407
	Jyotsna Chandra and Mahmoud A. Ghannoum	
<b>29</b>	<b>Echinocandin Resistance</b> .....	415
	David S. Perlin	
<b>30</b>	<b>Antifungal Targets, Mechanisms of Action, and Resistance in <i>Candida albicans</i></b> .....	429
	Robert A. Akins and Jack D. Sobel	

#### Part V Viral Drug Resistance: Mechanisms

<b>31</b>	<b>Mechanisms of Resistance of Antiviral Drugs Active Against the Human Herpes Virus</b> .....	479
	Clyde S. Crumpacker II	
<b>32</b>	<b>Resistance to Influenza Neuraminidase Inhibitors</b> .....	491
	Hui-Ling Yen	

<b>33 Resistance Mechanisms to HIV-1 Nucleoside Reverse Transcriptase Inhibitors.....</b>	<b>503</b>
Brian D. Herman, Robert A. Domaoal, Maryam Ehteshami and Raymond F. Schinazi	
<b>34 HIV-1 Resistance to the Nonnucleoside Reverse Transcriptase Inhibitors .....</b>	<b>521</b>
Nicolas Sluis-Cremer	
<b>35 Drug Resistance to HIV-1 Protease Inhibitors: Molecular Mechanisms and Substrate Coevolution .....</b>	<b>535</b>
Nese Kurt Yilmaz and Celia A. Schiffer	
<b>36 HIV-1 Entry and Fusion Inhibitors: Mechanisms and Resistance.....</b>	<b>545</b>
Colin M. Venner, Annette N. Ratcliff, Mathieu Coutu, Andrés Finzi, and Eric J. Arts	
<b>37 HIV-1 Resistance to Integrase Inhibitors.....</b>	<b>559</b>
Ying-Shan Han, Thibault Mesplède, and Mark A. Wainberg	
<b>38 The Hepatitis B Virus and Antiviral Drug Resistance: Causes, Patterns and Mechanisms .....</b>	<b>565</b>
Stephen A. Locarnini	
<b>39 HCV Drug Resistance.....</b>	<b>579</b>
Bianca Heinrich and John P. Bilello	
 <b>Part VI Parasitic Drug Resistance: Mechanisms</b>	
<b>40 Drug Resistance Mechanisms in <i>Entamoeba histolytica</i>, <i>Giardia lamblia</i>, <i>Trichomonas vaginalis</i>, and Opportunistic Anaerobic Protozoa.....</b>	<b>613</b>
Consuelo Gómez García, Laurence A. Marchat, Lilia López-Cánovas, D. Guillermo Pérez, Mario A. Rodríguez, and Esther Orozco	
<b>41 Mechanisms of Antimalarial Drug Resistance .....</b>	<b>629</b>
Giancarlo A. Biagini and Stephen A. Ward	
<b>42 Drug Resistance in <i>Leishmania</i>.....</b>	<b>649</b>
Goutam Mandal, Vaidya Govindarajan, Mansi Sharma, Hiranmoy Bhattacharjee, and Rita Mukhopadhyay	
<b>43 Drug Resistance in <i>Trypanosoma brucei</i> .....</b>	<b>667</b>
Fabrice E. Graf and Pascal Mäser	
<b>44 Mechanisms of Drug Resistance in <i>Toxoplasma gondii</i> .....</b>	<b>677</b>
Alexandre Mzabi, Dominique Aubert, and Isabelle Villena	
<b>45 <i>Eimeria</i> and <i>Cryptosporidium</i>: Recent Advances in the Therapeutic Field .....</b>	<b>685</b>
Dominique Aubert and Loïc Favennec	
<b>46 Drug Resistance in Nematodes .....</b>	<b>689</b>
Roger K. Prichard	
<b>47 Chemotherapy and Drug Resistance in Schistosomiasis and Other Trematode and Cestode Infections .....</b>	<b>705</b>
Robert M. Greenberg and Michael J. Doenhoff	
<b>48 Drug Resistance in Ectoparasites of Medical and Veterinary Importance .....</b>	<b>735</b>
Kathryn A. Stafford and Gerald Christopher C. Coles	
<b>Index.....</b>	<b>745</b>

Antimicrobial Drug Resistance

Mechanisms of Drug Resistance, Volume 1

Mayers, D.L.; Sobel, J.D.; Ouellette, M.; Kaye, K.S.;

Marchaim, D. (Eds.)

2017, XXI, 773 p. 164 illus., 61 illus. in color.,

ISBN: 978-3-319-46718-4