Contents

1 Macro- and Microstructure of the Airways for Drug Delivery ............ 1
   Kevin P. O’Donnell and Hugh D.C. Smyth

2 Pulmonary Drug Metabolism, Clearance, and Absorption ............... 21
   Bo Olsson, Eva Bondesson, Lars Borgström, Staffan Edsbäcker,
   Stefan Eirefelt, Katarina Ekelund, Lena Gustavsson,
   and Tove Hegelund-Myrbäck

3 Pulmonary Drug Delivery: An Historical Overview ....................... 51
   Mark Sanders

4 The Physics of Aerosol Droplet and Particle Generation
   from Inhalers .................................................................................. 75
   Zhen Xu and Anthony J. Hickey

5 Overcoming Lung Clearance Mechanisms
   for Controlled Release Drug Delivery .............................................. 101
   Ibrahim M. El-Sherbiny, Diana G. Villanueva, Dea Herrera,
   and Hugh D.C. Smyth

6 Targeted Drug Delivery Through the Respiratory System:
   Molecular Control on Lung Absorption and Disposition .................. 127
   Masahiro Sakagami and Mark Gumbleton

7 Controlled Transport for Pulmonary Drug Delivery ....................... 143
   Jennifer Fiegel, Timothy Brenza, and Rania Hamed

8 Science and Technology of Pressurized Metered-Dose Inhalers ........ 165
   Sandro R.P. da Rocha, Balaji Bharatwaj, and Sowmya Saiprasad

9 Science and Technology of Dry Powder Inhalers ............................ 203
   Timothy M. Crowder and Martin J. Donovan

ix
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Science and Technology of Nebulizers and Liquid-Based Aerosol Generators</td>
<td>Aileen Gibbons and Hugh D.C. Smyth</td>
<td>223</td>
</tr>
<tr>
<td>11</td>
<td>Excipients Utilized for Modifying Pulmonary Drug Release</td>
<td>Poonam Sheth and Paul B. Myrdal</td>
<td>237</td>
</tr>
<tr>
<td>12</td>
<td>Polymers for Pulmonary Drug Delivery</td>
<td>Poonam Sheth and Paul B. Myrdal</td>
<td>265</td>
</tr>
<tr>
<td>13</td>
<td>Particle Engineering Technologies for Pulmonary Drug Delivery</td>
<td>Nashwa El-Gendy, Mark M. Bailey, and Cory Berkland</td>
<td>283</td>
</tr>
<tr>
<td>14</td>
<td>Liposomes for Pulmonary Drug Delivery</td>
<td>Janani Swaminathan and Carsten Ehrhardt</td>
<td>313</td>
</tr>
<tr>
<td>15</td>
<td>Nanoparticles for Pulmonary Delivery</td>
<td>Alan B. Watts and Robert O. Williams III</td>
<td>335</td>
</tr>
<tr>
<td>16</td>
<td>Pulmonary Delivery of Plasmid DNA for Disease Prevention and Therapy</td>
<td>Simon Heuking and Gerrit Borchard</td>
<td>367</td>
</tr>
<tr>
<td>17</td>
<td>In Vitro Performance Testing for Pulmonary Drug Delivery</td>
<td>Yoen-Ju Son, Jolyon P. Mitchell, and Jason T. McConville</td>
<td>383</td>
</tr>
<tr>
<td>18</td>
<td>In Vitro Cell Culture Models for Evaluating Controlled Release Pulmonary Drug Delivery</td>
<td>Stephen T. Buckley, Kwang-Jin Kim, and Carsten Ehrhardt</td>
<td>417</td>
</tr>
<tr>
<td>19</td>
<td>In Vivo Animal Models for Controlled-Release Pulmonary Drug Delivery</td>
<td>Lucila Garcia-Contreras</td>
<td>443</td>
</tr>
<tr>
<td>20</td>
<td>Imaging Pulmonary Drug Delivery</td>
<td>Philip J. Kuehl</td>
<td>475</td>
</tr>
<tr>
<td>21</td>
<td>Development and Approval of Inhaled Respiratory Drugs: A US Regulatory Science Perspective</td>
<td>Gur Jai Pal Singh and Guirag Poochikian</td>
<td>489</td>
</tr>
<tr>
<td>22</td>
<td>Developing Performance Specifications for Pulmonary Products</td>
<td>Stephen T. Horhota and Stefan Leiner</td>
<td>529</td>
</tr>
</tbody>
</table>

About the Editors .......................................................... 543

Index ........................................................................................... 545
Controlled Pulmonary Drug Delivery
Smyth, H.D.C.; Hickey, A.J. (Eds.)
2011, XIV, 558 p., Hardcover