Contents

1 Ferric Siderophore Transport via Outer Membrane Receptors of *Escherichia coli*: Structural Advancement and A Tribute to Dr. Dick van der Helm—an ‘Ironman’

1.1 Introduction .................................................. 2
1.2 Siderophore-Mediated Iron Transport Systems .................... 6
  1.2.1 Ferric-Siderophore Transport Systems in *E. coli* .......... 7
1.3 Current Structural Advancement in the Components of the Ferric-Siderophore Transport Systems from *E. coli* .......... 8
  1.3.1 Crystal Structures of TBDTs from *E. coli* .............. 9
  1.3.2 Periplasmic Binding Protein Connects the Transport Process via OM and CM .......................... 10
  1.3.3 Crystal Structures of TonB and its Complex with FhuA .................. 11
1.4 Roles of ExbB and ExbD ...................................... 16
  1.4.1 ExbD Structure ...................................... 17
  1.4.2 ExbB Structure ...................................... 19
  1.4.3 Role of TonB-ExbB-ExbD Complex in Energy Transduction .................. 19
1.5 Structures of Components Involved in Genetic Regulation .... 21
1.6 Mechanism of Transport via Outer Membrane .................... 23
1.7 Conclusions .................................................. 25
References .......................................................... 25

2 The Tricky Ways Bacteria Cope with Iron Limitation ............ 31
2.1 Introduction .................................................. 32
2.2 Iron Transport into Gram-Negative Bacteria .................... 32
  2.2.1 Transport Across the Outer Membrane ..................... 32
  2.2.2 FhuA Transports Ferrichrome ............................ 35
  2.2.3 FepA Transports Fe³⁺ Enterobactin ......................... 37
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3</td>
<td>Heme Uptake in Fluorescent Pseudomonads</td>
<td>76</td>
</tr>
<tr>
<td>3.4</td>
<td>Uptake of Fe$^{2+}$</td>
<td>77</td>
</tr>
<tr>
<td>3.5</td>
<td>Regulation of Iron Uptake</td>
<td>78</td>
</tr>
<tr>
<td>3.5.1</td>
<td>ECF Sigma Factors</td>
<td>78</td>
</tr>
<tr>
<td>3.5.2</td>
<td>Other Fur-Regulated Regulators</td>
<td>79</td>
</tr>
<tr>
<td>3.5.3</td>
<td>Regulation by Small RNAs</td>
<td>79</td>
</tr>
<tr>
<td>3.5.4</td>
<td>Other Regulators Influencing Iron Homeostasis</td>
<td>81</td>
</tr>
<tr>
<td>3.6</td>
<td>Conclusions</td>
<td>82</td>
</tr>
<tr>
<td>References</td>
<td>83</td>
<td></td>
</tr>
</tbody>
</table>
Iron Uptake in Bacteria with Emphasis on E. coli and Pseudomonas
Chakraborty, R.; Braun, V.; Hantke, K.; Cornelis, P. (Eds.)
2013, XI, 89 p. 17 illus., 14 illus. in color., Softcover