

# Contents

<i>Metabolic Diagram appears on both inside covers</i>	
<i>List of Contributors</i>	page xi
<i>Preface</i>	xv
<b>1 Historical overview and recent perspectives</b>	<b>1</b>
<i>David E. I. Wilcken and Bridget Wilcken</i>	
PART ONE. BIOCHEMISTRY AND PHYSIOLOGY	
<i>Section One. Chemistry</i>	
<b>2 Practical chemistry of homocysteine and other thiols</b>	<b>9</b>
<i>Donald W. Jacobsen</i>	
<b>3 Biosynthesis and reactions of homocysteine thiolactone</b>	<b>21</b>
<i>Hieronim Jakubowski</i>	
<b>4 Unique aspects of sulfur chemistry: Homocysteine and lipid oxidation</b>	<b>32</b>
<i>Jay W. Heinecke</i>	
<b>5 Homocysteine, nitric oxide, and nitrosothiols</b>	<b>39</b>
<i>Andrew J. Gow, Fred Cobb, and Jonathan S. Stamler</i>	
<i>Section Two. Biochemistry and Metabolism</i>	
<b>6 Biosynthesis of S-adenosylmethionine</b>	<b>47</b>
<i>José M. Mato, Matias A. Avila, and Fernando J. Corrales</i>	
<b>7 S-adenosylmethionine-dependent methyltransferases</b>	<b>63</b>
<i>Steven Clarke and Kelley Banfield</i>	
<b>8 S-adenosylhomocysteine hydrolase</b>	<b>79</b>
<i>Sean T. Prigge and Peter K. Chiang</i>	
<b>9 Regulation of homocysteine metabolism</b>	<b>92</b>
<i>James D. Finkelstein</i>	
<b>10 Microbial modeling of human disease: Homocysteine metabolism</b>	<b>100</b>
<i>Rowena G. Matthews and Martha L. Ludwig</i>	
<b>11 Folate metabolism</b>	<b>113</b>
<i>Robert J. Cook</i>	

<b>12 Cobalamin-dependent remethylation</b>	<b>135</b>
<i>Horatiu Olteanu and Ruma Banerjee</i>	
<b>13 Betaine-dependent remethylation</b>	<b>145</b>
<i>Timothy A. Garrow</i>	
<b>14 The transsulfuration pathway</b>	<b>153</b>
<i>Warren D. Kruger</i>	
<b>Section Three. Physiology</b>	
<b>15 Transport and tissue distribution of homocysteine and related S-adenosyl compounds</b>	<b>163</b>
<i>Brian Fowler</i>	
<b>16 Homocysteine and the kidney</b>	<b>176</b>
<i>John T. Brosnan</i>	
<b>17 Homocysteine and the nervous system</b>	<b>183</b>
<i>Anne M. Molloy and Donald G. Weir</i>	
<b>Section Four. Clinical Chemistry</b>	
<b>18 Methodologies of testing</b>	<b>199</b>
<i>Karsten Rasmussen and Jan Møller</i>	
<b>19 Methionine loading</b>	<b>212</b>
<i>Jonathan Silberberg and Nicholas Dudman</i>	
PART TWO. CLINICAL DYSFUNCTION AND HYPERHOMOCYSTEINEMIA	
<b>Section Five. Genetic Disorders</b>	
<b>20 Cystathionine-<math>\beta</math>-synthase and its deficiency</b>	<b>223</b>
<i>Jan P. Kraus and Viktor Kožich</i>	
<b>21 Inborn errors of folate and cobalamin metabolism</b>	<b>244</b>
<i>David S. Rosenblatt</i>	
<b>22 Polymorphisms of folate and cobalamin metabolism</b>	<b>259</b>
<i>Rima Rozen</i>	
<b>Section Six. Acquired Disorders</b>	
<b>23 Folate deficiency</b>	<b>271</b>
<i>Ralph Carmel</i>	
<b>24 Cobalamin deficiency</b>	<b>289</b>
<i>Ralph Carmel</i>	
<b>25 Vitamin B<sub>6</sub> deficiency</b>	<b>307</b>
<i>Jesse F. Gregory III</i>	
<b>26 Homocysteine in renal disease</b>	<b>321</b>
<i>Margret Arnadottir and Björn Hultberg</i>	
<b>27 Diseases and drugs associated with hyperhomocysteinemia</b>	<b>331</b>
<i>Henk J. Blom</i>	
<b>28 Lifestyle factors associated with hyperhomocysteinemia</b>	<b>341</b>
<i>Stein Emil Vollset, Helga Refsum, Ottar Nygård, Per Magne Ueland</i>	
<b>Section Seven. Clinical Consequences in Hyperhomocysteinemia</b>	
<b>29 Epidemiology of vascular and thrombotic associations</b>	<b>357</b>
<i>Petra Verhoef and Meir Stampfer</i>	
<b>30 Homocysteine and coronary artery disease</b>	<b>371</b>
<i>Killian Robinson</i>	
<b>31 Homocysteine and cerebral vascular disease</b>	<b>384</b>
<i>J. David Spence and James F. Toole</i>	

<b>32 Peripheral arterial disease</b>	<b>393</b>
<i>Godfried Boers</i>	
<b>33 Venous disease</b>	<b>401</b>
<i>Armando D'Angelo and Chiara Beltrametti</i>	
<b>34 Homocysteine and hemostasis</b>	<b>415</b>
<i>Katherine A. Hajjar</i>	
<b>35 Cellular mechanisms of homocysteine pathogenesis in atherosclerosis</b>	<b>425</b>
<i>Donald W. Jacobsen</i>	
<b>36 Homocysteine and cardiovascular physiology</b>	<b>441</b>
<i>Steven R. Lentz</i>	
<b>37 Homocysteine and human reproduction</b>	<b>451</b>
<i>T.K.A.B. Eskes</i>	
<i>Section Eight. Intervention and Therapy</i>	
<b>38 Modification of hyperhomocysteinemia</b>	<b>467</b>
<i>John M. Scott</i>	
<b>39 Design of clinical trials to test the homocysteine hypothesis of vascular disease</b>	<b>477</b>
<i>Robert Clarke</i>	
<b>40 What is a desirable homocysteine level?</b>	<b>485</b>
<i>Johan B. Ubbink</i>	
<i>Index</i>	<b>491</b>