

CONTENTS

<i>Contributors</i>	<i>ix</i>
<i>Preface</i>	<i>xi</i>
1. Regulation of Blood Stem Cell Development	1
E. Dzierzak and E. de Pater	
1. Introduction	2
References	15
2. Hematopoietic Stem Cell and Its Bone Marrow Niche	21
V.W.C. Yu and D.T. Scadden	
1. Introduction	22
2. Evolution of the Stem Cell Niche Concept	23
3. Location Matters	25
4. Cellular Participants in the Bone Marrow Microenvironment	27
5. The Sympathetic Nervous System	33
6. HSC Mobilization from the BM Niche	34
7. Niche of Hematopoietic Malignancies	37
8. Perspectives	39
References	41
3. The Hematopoietic Stem and Progenitor Cell Cistrome: GATA Factor-Dependent <i>cis</i>-Regulatory Mechanisms	45
K.J. Hewitt, K.D. Johnson, X. Gao, S. Keles, and E.H. Bresnick	
1. <i>cis</i> -Regulatory Mechanisms	46
2. GATA Factor Interactions with DNA and Chromatin	47
3. Components of Scl/TAL1 and GATA Factor Complexes at E-box-GATA Elements	59
4. HSPC Cistrome	62
5. Perspective	64
References	65

4. ETS Transcription Factor ETV2/ER71/Etsrp in Hematopoietic and Vascular Development	77
S. Sumanas and K. Choi	
1. Introduction	78
2. Etv2 Is Transiently Expressed in the Hemangiogenic Progenitors	79
3. ETV2 Is Sufficient to Induce Hematopoietic and Endothelial Cell Formation	82
4. Nonredundant and Transient Role of ETV2 In Hematopoietic and Endothelial Cell Formation	84
5. ETV2, VEGF, and FLK1 in Hematopoietic and Endothelial Cell Formation	89
6. ETV2 Regulates Hemangiogenic versus Cardiac Mesoderm Outcome	91
7. ETS Hierarchy and ETS Switching Mechanisms in Hematopoietic and Vascular Development	96
8. ETV2 in Definitive Hematopoietic Program and Function	98
9. Regulation of <i>Etv2</i> Expression	99
10. Closing Thoughts and Future Directions	101
Acknowledgments	104
References	104
5. Taking the Leap: Runx1 in the Formation of Blood from Endothelium	113
J. Tober, M.W. Majtenburg, and N.A. Speck	
1. The Three Waves of Blood Cell Formation	114
2. The Role of Runx1 in the Formation of Embryonic Progenitors and HSCs	118
3. The Temporal Requirement for Runx1 in Hemogenic Endothelium	122
4. Downstream Runx1 Targets That Execute the Endothelial to Hematopoietic Cell Transition	125
5. Epigenetic Regulation by Runx1	127
6. <i>Cis</i> -Acting Sequences Regulating Runx1 Transcription	128
7. The Gene Regulatory Network Upstream of Runx1	131
8. Signaling Pathways Regulating Runx1 Expression in the Aorta	141
9. Conclusions and Future Directions	148
References	149
6. SCL/TAL1 in Hematopoiesis and Cellular Reprogramming	163
T. Hoang, J.A. Lambert, and R. Martin	
1. Introduction	164
2. SCL Function During Development	165
3. The Long, the Intermediate, and the Short (Term): HSC Function and <i>Scf</i>	174

4. The SCL Complex	178
5. SCL and Cellular Reprogramming	182
6. Concluding Remarks	190
Acknowledgments	191
References	191
7. Navigating Transcriptional Coregulator Ensembles to Establish Genetic Networks: A GATA Factor Perspective	205
A.W. DeVilbiss, N. Tanimura, S.C. McIver, K.R. Katsumura, K.D. Johnson, and E.H. Bresnick	
1. Introduction	206
2. The GATA Factor Coregulator Repertoire	209
3. GATA Factor Posttranslational Modifications	220
4. Transcription Factor Cooperation	224
5. Assembling and Deciphering a Coregulator Matrix Governing GATA Factor Function	227
References	230
8. Noncoding Regulatory RNAs in Hematopoiesis	245
M. Jeong and M.A. Goodell	
1. Introduction	246
2. Emerging Importance of Regulatory RNAs in Hematopoiesis	247
3. Regulatory RNAs in Normal Hematopoiesis	250
4. ncRNAs in Hematopoietic Malignancies	260
5. ncRNAs as Biomarkers	262
6. LncRNA Databases	262
7. Conclusions	263
Acknowledgments	264
References	264
Index	271