Contents

Part I Massive Wastage of Pregnancy Specific Biological Substances

1 A Massive Wastage of the Global Resources .......................... 3
Andrew Burd and Lin Huang

Part II Basic Science and the Role of Placenta

2 Placenta as a Source of Stem Cells and as a
Key Organ for Fetomaternal Tolerance ................................. 11
Ornella Parolini and Maddalena Soncini

3 Placenta and Umbilical Cord in Traditional Chinese Medicine ...... 25
Ping Chung Leung

Part III Use of Cord Blood in Biochemistry

4 Use of Umbilical Venous Blood on Assessing the Biochemical
Variations of Acid–Base, Nutritional and Metabolic Parameters
on Growth-Retarded Fetuses, in Comparison with Gestational
Control Cases: A Study ........................................ 31
Chantal Bon and Daniel Raudrant

Part IV Use of Cord Blood as Blood Substitute

5 Umbilical Cord Blood Transfusion and Its
Therapeutic Potentialities .................................................. 45
Patricia Pranke and Tor Onsten

6 Autologous Placental Blood Transfusion for the Therapy
of Anemic Neonates ......................................................... 57
Thomas Brune, F. Louwen, C. Troeger, W. Holzgreve, and H.S.P. Garritsen

7 Cord Blood: A Massive Waste of a Life-Saving Resource,
a Perspective on Its Current and Potential Uses ...................... 67
Tang-Her Jaing and Robert Chow

8 Clinical Experience of Cord Blood Autologous Transfusion ........ 75
Shigeharu Hosono
9 Emergency Use of Human Cord Blood .......................... 85
Norman Ende, Kathleen M. Coakley, and Kenneth Swan

10 Hemoglobin-Based Oxygen Carriers in Trauma Care:
The US Multicenter Prehospital Trial .......................... 91
Ernest E. Moore, Hunter B. Moore,
Tomohiko Masuno, and Jeffrey L. Johnson

11 Placental Umbilical Cord Blood as a
True Blood Substitute with an Edge ............................ 103
Niranjan Bhattacharya

Part V Immunotherapy Potential of Fetal Cell in Maternal System

12 Implications of Feto-maternal Cell Transfer
in Normal Pregnancy ........................................ 115
Carolyn Troeger, Olav Lapaire, XiaoYan Zhong, and Wolfgang Holzgreve

13 Early Reports on the Prognostic Implications and
Immunotherapeutic Potentials of Cd34 Rich Cord Whole Blood
Transfusion in Advanced Breast Cancer with Severe Anemia ........ 123
Niranjan Bhattacharya

Part VI Use of Placental Umbilical Cord Blood in Neurology

14 Anti-inflammatory Effects of Human Cord Blood
and Its Potential Implication in Neurological Disorders .......... 141
Martina Vendrame

15 Transforming “Waste” into Gold: Identification
of Novel Stem Cells Resources with Therapeutic
Potential in Neuromuscular Disorders .......................... 149
Mariane Secco, Mayana Zatz, and Natassia Vieira

16 Human Umbilical Cord Blood Cells for Stroke ................ 155
Dong-Hyuk Park, Alison E. Willing, Cesar V. Borlongan,
Tracy A. Womble, L. Eduardo Cruz, Cyndy D. Sanberg,
David J. Eve, and Paul R. Sanberg

17 Placental Umbilical Cord Blood Transfusion
for Stem Cell Therapy in Neurological Diseases .................. 169
Abhijit Chaudhuri and Niranjan Bhattacharya

Part VII Use of Placental Umbilical Cord Blood Serum in Ophthalmology

18 Umbilical Cord and Its Blood: A Perspective on
Its Current and Potential Use in Ophthalmology ................. 177
Kyung-Chul Yoon
Part VIII Use of Placental Umbilical Cord in Cardiovascular Surgery

19 Umbilical Vein Grafts for Lower Limb Revascularization .......... 189
   Alan Dardik and Herbert Dardik

Part IX Use of Cord Blood in Cardiovascular Medicine

20 Cord Blood Stem Cells in Angiogenesis ......................... 201
   Peter Hollands

21 Endothelial Progenitor Cells from Cord Blood:
   Magic Bullets Against Ischemia? ................................ 205
   Maurizio Pesce, Giulio Pompilio, and Maurizio C. Capogrossi

22 Therapeutic Potential of Placental Umbilical Cord
   Blood in Cardiology ............................................. 215
   Shunichio Miyoshi, Nobuhiro Nishiyama, Naoko Hida,
   Akihiro Umezawa, and Satoshi Ogawa

23 Stem Cell Therapy for Heart Failure Using Cord Blood .......... 221
   Amit N. Patel, Ramasamy Sakthivel, and Thomas E. Ichim

24 Human Umbilical Cord Blood Mononuclear Cells
   in the Treatment of Acute Myocardial Infarction ................. 237
   Robert J. Henning

Part X Use of Placental Umbilical Cord Blood in Other
   Subspecialities of Regeneration Medicine

25 Umbilical Cord-Derived Mesenchymal Stem Cells .............. 249
   Jose J. Minguell

26 Cord Blood Stem Cell Expansion Ex Vivo:
   Current Status and Future Strategies ................................ 255
   Jian-Xin Gao and Quansheng Zhou

27 Embryonic-Like Stem Cells and the Importance
   of Human Umbilical Cord Blood for Regenerative Medicine ....... 271
   Colin P. McGuckin and Nicolas Forraz

28 Use of Non-hematopoietic Stem Cells of Fetal Origin
   from Cord Blood, Umbilical Cord, and Placenta
   in Regeneration Medicine ......................................... 283
   Zygmunt Pojda

29 Animal Studies of Cord Blood and Regeneration ............... 297
   Thomas E. Ichim, Michael P. Murphy, and Neil Riordan

30 Immune Privilege of Cord Blood .................................. 307
   Neil H. Riordan and Thomas E. Ichim
31 Combination Cellular Therapy for Regenerative Medicine: The Stem Cell Niche ....................................... 321
   Ian K. McNiece

32 Use of Cord Blood in Regenerative Medicine ........................... 329
   David T. Harris

Part XI Cord Blood Collection Variability and Banking

33 Comparisons Between Related and Unrelated Cord
   Blood Collection and/or Banking for Transplantation
   or Research: The UK NHS Blood and Transplant Experience ...... 339
   Suzanne M. Watt, Katherine Coldwell, and Jon Smythe

34 Donor and Collection-Related Variables Affecting
   Product Quality in Ex utero Cord Blood Banking .................... 355
   Sabeen Askari

35 Cord Blood as a Source of Hematopoietic Progenitors
   for Transplantation ............................................. 361
   Pilar Solves, Amando Blanquer, and Vicente Mirabet

Part XII Clinical Use of Amniotic Fluid

36 Amniotic Fluid and Placenta Stem Cells ............................... 375
   Anthony Atala

37 Use of Amniotic Membrane, Amniotic Fluid,
   and Placental Dressing in Advanced Burn Patients ................... 383
   Niranjan Bhattacharya

38 Clinical Use of Amniotic Fluid in Osteoarthritis:
   A Source of Cell Therapy ......................................... 395
   Niranjan Bhattacharya

Part XIII Clinical Issue of Aborted Human Tissue

39 A Study and Follow-up (1999–2009) of Human Fetal Neuronal
   Tissue Transplants at a Heterotopic Site Outside the Brain
   in Cases of Advanced Idiopathic Parkinsonism ....................... 407
   Niranjan Bhattacharya

Part XIV Ethics

40 Ethical Issues Surrounding Umbilical Cord Blood
   Donation and Banking ........................................... 443
   Gabrielle Samuel, Ian Kerridge, and Tracey O’Brien

Index .......................................................... 453
Regenerative Medicine Using Pregnancy-Specific Biological Substances
Bhattacharya, N.; Stubblefield, P. (Eds.)
2011, XXXV, 460 p., Hardcover