

CHAPTER ONE: INTRODUCTION.....	1
REASONS FOR DOING THE STUDY	1
STUDY GOAL AND OBJECTIVES	1
SCOPE OF REPORT	2
METHODOLOGIES AND INFORMATION SOURCES.....	2
ANALYST CREDENTIALS.....	2
RELATED BCC REPORTS	3
BCC ONLINE SERVICES.....	3
DISCLAIMER	3
 CHAPTER TWO: SUMMARY.....	 4
MAJOR FINDINGS.....	4
<i>SUMMARY TABLE GLOBAL BLOOD COLLECTION, PROCESSING,</i> <i>AND THERAPEUTICS MARKET, THROUGH 2015 (\$ MILLIONS)</i>	 5
<i>SUMMARY FIGURE GLOBAL BLOOD MARKET, BY REGION, 2010</i> <i>AND 2015 (%)</i>	 5
<i>SUMMARY FIGURE (CONTINUED)</i>	6
 CHAPTER THREE: OVERVIEW	 7
HISTORY OF THE BLOOD INDUSTRY	7
<i>TABLE 1 TIMELINE OF THE BLOOD INDUSTRY</i>	8
CONSOLIDATION IN THE INDUSTRY.....	9
<i>TABLE 2 SELECTED ACQUISITIONS AND MERGERS IN THE</i> <i>GLOBAL BLOOD INDUSTRY, 2006-2011 (\$ MILLIONS)</i>	 10
DYNAMICS OF BLOOD DONATION.....	10
BLOOD COLLECTION AND PROCESSING MARKET STRUCTURE	11
AND SIZE.....	11
<i>TABLE 3 U.S. BLOOD COLLECTION AND PROCESSING PRODUCTS</i> <i>MARKET, THROUGH 2015 (\$ MILLIONS)</i>	 11
BLOOD AND ITS COMPONENTS.....	11
<i>TABLE 4 COMPOSITION OF BLOOD</i>	12
PLASMA.....	12
Uses for Plasma Proteins	13
<i>TABLE 5 PERCENT OF PLASMA PROTEINS AND THE DISEASES</i> <i>AND DISORDERS THEY TREAT</i>	 13
Immunoglobulin Products	14
CELLULAR ELEMENTS	14
Red Blood Cells	14
White Blood Cells	15
Platelets	15
TRANSFUSION-ASSOCIATED RISKS	16
DISEASES CONTRACTED FROM BLOOD TRANSFUSION AND RELATED IDENTIFICATION TESTING	 16
<i>TABLE 6 DISEASES CONTRACTED FROM BLOOD TRANSFUSIONS</i>	16

<i>TABLE 6 (CONTINUED)</i>	17
HIV/AIDS	17
<i>TABLE 7 CBER-LICENSED HIV DONOR SCREENING TESTS</i>	18
<i>TABLE 7 (CONTINUED)</i>	19
Hepatitis A.....	20
Worldwide Incidences of Hepatitis A.....	20
Hepatitis B (HBV)	20
<i>TABLE 8 CBER-LICENSED SCREENING TEST FOR HEPATITIS B</i>	21
Hepatitis C	22
<i>TABLE 9 CBER-LICENSED SCREENING TESTS FOR HEPATITIS C</i>	22
Hepatitis D.....	23
Hepatitis E.....	23
Human T-Cell Lymphotropic Virus (HTLV-I, II).....	23
<i>TABLE 10 CBER-LICENSED SCREENING TESTS FOR HTLV-I AND</i> <i>HTLV-II</i>	24
Cytomegalovirus	24
<i>TABLE 11 CBER-LICENSED SCREENING TESTS FOR CMV</i>	25
<i>TABLE 12 CBER-LICENSED SCREENING TESTS FOR WEST NILE</i> <i>VIRUS</i>	26
“Mad Cow Disease”/Creutzfeldt-Jakob Disease (CJD).....	26
Syphilis.....	27
<i>TABLE 13 CBER-LICENSED SCREENING TESTS FOR SYPHILIS</i>	27
Chagas Disease.....	27
<i>TABLE 14 CBER-LICENSED SCREENING TESTS FOR</i> <i>TRYPANOSOMA CRUZI (CHAGAS DISEASE)</i>	28
<i>TABLE 15 CBER-LICENSED SCREENING TEST, BY TYPE</i>	28
<i>TABLE 15 (CONTINUED)</i>	29
<i>FIGURE 1 TYPES OF BLOOD SCREENING TESTS (%)</i>	30
CREATING A VIRUS-FREE BLOOD SUPPLY	30
CERUS CORP.	31
COST OF A VIRUS-FREE BLOOD SUPPLY	31
PLASMA TREATMENTS TO INACTIVATE VIRUSES.....	31
Trinitrobutyl Phosphate and Sodium Cholate	31
Methylene Blue-Treated Plasma	32
Amatosalen HCL-Treated Plasma.....	32
NEGATIVE REACTIONS FROM BLOOD TRANSFUSIONS	33
BLOOD/PLASMA COMPONENT RISKS.....	34
CHAPTER FOUR: BLOOD COLLECTION, TYPING, AND PROCESSING	35
<i>TABLE 16 PROJECTED GLOBAL MARKET FOR BLOOD/PLASMA</i> <i>COLLECTION, TYPING AND TESTING, AND PROCESSING</i> <i>EQUIPMENT AND SUPPLIES, THROUGH 2015 (\$ MILLIONS)</i>	35
BLOOD COLLECTION	36
METHODS FOR COLLECTING BLOOD	36

<i>TABLE 17 PROJECTED GLOBAL MARKET FOR MANUAL AND AUTOMATIC BLOOD COLLECTION EQUIPMENT AND SUPPLIES, THROUGH 2015 (\$ MILLIONS)</i>	37
MANUAL COLLECTION	37
AUTOMATED COLLECTION.....	37
Plasmapheresis.....	38
Plateletpheresis	38
Leukopheresis.....	39
Red Blood Cell Apheresis	39
BLOOD SALVAGE EQUIPMENT	39
<i>TABLE 18 PROJECTED GLOBAL MARKET FOR AUTOMATED BLOOD SALVAGE EQUIPMENT, THROUGH 2015 (\$ MILLIONS)</i>	40
BLOOD BAGS	40
<i>TABLE 19 PROJECTED GLOBAL MARKET FOR BLOOD BAGS, THROUGH 2015 (\$ MILLIONS)</i>	41
BLOOD FILTERS	41
<i>TABLE 20 PROJECTED GLOBAL MARKET FOR BLOOD FILTERS, THROUGH 2015 (MILLIONS)</i>	42
TRANSFUSION SETS, ACCESSORIES	42
OTHER EQUIPMENT	42
<i>TABLE 21 PROJECTED GLOBAL MARKET FOR OTHER COLLECTION EQUIPMENT INCLUDING BLOOD TRANSFUSION SETS AND ACCESSORIES, THROUGH 2015 (\$ MILLIONS)</i>	43
MARKET DRIVERS IN BLOOD COLLECTION.....	43
U.S. BLOOD COLLECTION ORGANIZATIONS.....	43
FOR-PROFIT BLOOD COLLECTION CONTROVERSY	44
NONPROFIT BLOOD COLLECTION IN THE U.S.....	44
American Red Cross (ARC)	44
Community Blood Banks.....	44
Hospitals	45
Other Blood Collection Sites	45
U.S. BLOOD DONATION DEMOGRAPHICS	45
DONOR RECRUITMENT AND REGULATIONS.....	45
BLOOD SCREENING AND EVALUATION	46
BLOOD COLLECTION EFFORTS THROUGHOUT THE WORLD.....	46
SOUTH AMERICA/CENTRAL AMERICA.....	47
ASIA.....	47
PACIFIC REGION	47
AFRICA	48
CANADA.....	48
EUROPE.....	48
United Kingdom	48
France	48
GLOBAL NATURE OF THE PLASMA INDUSTRY.....	49

PLASMA DONORS	49
COMMERCIAL NATURE OF PLASMAPHERESIS	50
PLASMA COLLECTION CENTERS IN THE U.S.	50
National Donor Referral Registry	51
PLASMA FRACTIONATORS	51
DISTRIBUTORS/BROKERS	52
BLOOD TYPING.....	52
METHODS OF TYPING	52
Slide/Tile Testing.....	53
Tube Testing	53
Microplate Testing Methods.....	53
AUTOMATED BLOOD TYPING AND SCREENING METHODS.....	54
Immucor	54
Ortho-Clinical Diagnostics	54
Abbott.....	55
BLOOD TRANSFUSION TESTING	55
MANUAL CROSSMATCH TECHNIQUES	55
Major Crossmatch.....	55
Minor Crossmatch	56
Antibody Screening.....	56
Coombs Test.....	56
BLOOD TESTING.....	56
<i>TABLE 22 TESTS ROUTINELY PERFORMED ON BLOOD</i>	
<i>DONATIONS</i>	57
<i>TABLE 23 BLOOD TYPE ANTIGEN/ANTIBODY REACTIONS</i>	57
<i>TABLE 24 PROJECTED GLOBAL MARKET FOR BLOOD TYPING AND</i>	
<i>TESTING, BY GEOGRAPHICAL AREA, THROUGH 2015 (\$</i>	
<i>MILLIONS)</i>	58
<i>FIGURE 2 PROJECTED GLOBAL MARKET FOR BLOOD TYPING AND</i>	
<i>TESTING, 2010 AND 2015 (%)</i>	58
<i>FIGURE 2 (CONTINUED)</i>	59
BLOOD PROCESSING.....	59
PREPARATION AND USE OF THE COMPONENTS	59
Red Blood Cells	60
Platelets	60
MARKET PARTICIPANTS	60
Haemonetics.....	60
PCS2	61
TCD Total Containment Unit	61
MCS+ 8150 System.....	61
Cell Saver System	61
OrthoPAT System	61
ACP 215 System.....	61
Fenwal.....	62

Autopheresis-C.....	62
Alyx Component Collection System	62
CS-3000 Plus Blood Cell Separator.....	62
Amicus Separator.....	62
Gambro BCT	63
Trima Accel Collection System.....	63
COBE Spectra Apheresis System.....	63
The Elutra Cell Separation System	63
GLOBAL BLOOD MANAGEMENT ISSUES	63
AVAILABILITY	63
BLOODLESS SURGERY.....	64
FEWER OPEN SURGICAL PROCEDURES	65
SAFETY ISSUES/RISK MANAGEMENT	65
Improved Donor Screening.....	65
Better Viral Testing.....	66
Encouraging Repeat Donors.....	66
Improving Viral Inactivation Processes	66
Selective Use of Blood Derivative Products.....	66
CHAPTER FIVE: BLOOD THERAPEUTICS	67
<i>TABLE 25 BLOOD PRODUCTS TRANSFUSED FOR THEIR</i>	
<i>THERAPEUTIC USES.....</i>	<i>67</i>
WHOLE BLOOD	67
PACKED RED BLOOD CELLS	68
PLATELETS	68
LEUKOCYTES.....	69
FRESH FROZEN PLASMA.....	69
SELECTED USES OF FFP	70
CRYOPRECIPITATE.....	70
WASHED CELLS.....	70
DEGLYCEROLIZED CELLS	71
OTHER BLOOD COMPONENTS	71
GRANULOCYTES	71
GAMMA-IRRADIATED BLOOD.....	71
DISTRIBUTION OF COLLECTED BLOOD	71
<i>TABLE 26 AVERAGE COST OF TRANSFUSION TO THE PATIENT IN</i>	
<i>THE U.S., BY PRODUCT TYPE, 2011 (\$)</i>	<i>72</i>
PLASMA AND PLASMA-DERIVED PRODUCTS	72
GLOBAL PLASMA COLLECTION.....	73
PLASMA MARKET SIZE	73
<i>TABLE 27 PROJECTED GLOBAL PLASMA MARKET, THROUGH 2015</i>	
<i>(\$ MILLIONS)</i>	<i>73</i>
<i>FIGURE 3 PLASMA PRODUCTS MARKET SHARE, BY COMPANY,</i>	
<i>2010 (%)</i>	<i>74</i>
COAGULATION FACTORS.....	74

IMMUNE SERUM GLOBULIN/INTRAMUSCULAR IMMUNE GLOBULINS (IMIG)/INTRAVENOUS IMMUNE GLOBULIN (IVIG)	75
Market Shortages of IVIG	75
FACTOR VIII	76
FACTOR IX AND FACTOR IX COMPLEX	76
FACTOR VIIA	76
FIBRIN/THROMBIN	76
THERAPEUTIC APHERESIS	77
CLOTTING FACTORS	77
<i>TABLE 28 BLOOD CLOTTING FACTORS</i>	78
Hemophilia.....	78
<i>TABLE 29 GLOBAL PREVALENCE OF HEMOPHILIA, 2009 (MILLIONS)</i>	79
CLOTTING FACTOR MARKET DEMAND AND MARKET SIZE.....	79
<i>TABLE 30 PROJECTED GLOBAL MARKET FOR PLASMA-DERIVED AND RECOMBINANT CLOTTING FACTORS, THROUGH 2015 (\$ MILLIONS)</i>	80
Factor VIII	80
<i>TABLE 31 FDA-APPROVED FACTOR VIII PRODUCTS</i>	81
Advate.....	81
Helixate FS.....	82
Kogenate FS.....	82
Recombinate.....	82
ReFacto.....	82
GLOBAL SHARE IN FACTOR VIII MARKET	83
<i>FIGURE 4 LEADING FACTOR VIII MANUFACTURERS, 2010 (%)</i>	83
<i>TABLE 32 PROJECTED U.S. MARKET FOR FACTOR VIII, THROUGH 2015 (\$ MILLIONS)</i>	84
Factor IX	84
<i>TABLE 33 PROJECTED GLOBAL MARKET FOR FACTOR IX, THROUGH 2015 (\$ MILLIONS)</i>	84
<i>TABLE 34 FDA-APPROVED FACTOR IX PRODUCTS, 2009</i>	85
Factor VIIa	85
<i>TABLE 35 PROJECTED GLOBAL MARKET FOR FACTOR VIIA, THROUGH 2015 (\$ MILLIONS)</i>	86
<i>FIGURE 5 GLOBAL SALES OF FACTOR VIIA, BY GEOGRAPHIC REGION, 2010 (%)</i>	86
<i>FIGURE 5 (CONTINUED)</i>	87
ALBUMIN	87
RECOMBINANT HUMAN ALBUMIN	88
Recombinant Human Albumin Market	88
ALBUMIN MARKET DYNAMICS.....	88

<i>TABLE 36 CURRENTLY MARKETED HUMAN ALBUMIN AND PPF PRODUCTS, 2010.....</i>	<i>89</i>
ALBUMIN AND PPF MARKET SIZE	89
<i>TABLE 37 PROJECTED GLOBAL MARKET FOR HUMAN SERUM ALBUMIN AND PPF, THROUGH 2015 (\$ MILLIONS).....</i>	<i>90</i>
PROTHROMBIN COMPLEX CONCENTRATE	90
<i>TABLE 38 FDA-APPROVED PROTHROMBIN COMPLEX CONCENTRATE PRODUCTS.....</i>	<i>90</i>
FIBRIN SEALANTS AND THROMBIN	91
FIBRIN-BASED WOUND CLOSURE PRODUCT MARKET	91
Cyanoacrylate	92
<i>TABLE 39 PROJECTED GLOBAL MARKET FOR FIBRIN-BASED SEALANTS, THROUGH 2015 (\$ MILLIONS)</i>	<i>92</i>
ANTITHROMBIN TREATMENTS	93
TREATMENTS FOR HD	93
Plasma Antithrombin	93
Recombinant Human Antithrombin (rhAT).....	93
Talecris Biotherapeutics	93
GTC Biotherapeutics	94
GlaxoSmithKline (Arixtra).....	94
GLOBAL MARKET FOR ANTITHROMBIN.....	94
<i>TABLE 40 PROJECTED GLOBAL MARKET FOR ANTITHROMBIN, THROUGH 2015 (\$ MILLIONS).....</i>	<i>95</i>
IMMUNOGLOBULINS	95
<i>TABLE 41 FDA-APPROVED IMMUNOGLOBULINS.....</i>	<i>96</i>
<i>TABLE 42 PROJECTED GLOBAL MARKET FOR IMMUNOGLOBULINS, THROUGH 2015 (\$ MILLIONS)</i>	<i>97</i>
POLYVALENT IMMUNOGLOBULINS	97
<i>TABLE 43 SELECTED CONDITIONS TREATED WITH IVIG</i>	<i>98</i>
The Projected Global IVIG Therapy Market	98
<i>TABLE 44 PROJECTED GLOBAL MARKET FOR IVIG THERAPY, THROUGH 2015 (\$ MILLIONS).....</i>	<i>98</i>
HYPERIMMUNE IMMUNOGLOBULINS.....	99
<i>TABLE 45 FDA-APPROVED HYPERIMMUNE IMMUNOGLOBULINS.....</i>	<i>99</i>
<i>TABLE 45 (CONTINUED).....</i>	<i>100</i>
GLOBAL MARKET FOR HYPERIMMUNOGLOBULINS	100
<i>TABLE 46 PROJECTED GLOBAL MARKET FOR HYPERIMMUNOGLOBULINS, THROUGH 2015 (\$ MILLIONS).....</i>	<i>101</i>
<i>FIGURE 6 GLOBAL MARKET FOR IMMUNOGLOBULINS, BY TYPE, 2009 AND 2015 (\$ MILLIONS).....</i>	<i>101</i>
Respiratory Syncytial Virus (RSV)	102
<i>TABLE 47 PROJECTED GLOBAL MARKET FOR RSV IMMUNOGLOBULIN, THROUGH 2015 (\$ MILLIONS).....</i>	<i>102</i>
Alpha-1-Proteinase Inhibitor	102

TABLE 48 PROJECTED GLOBAL MARKET FOR ALPHA-1- PROTEINASE INHIBITOR, THROUGH 2015 (\$ MILLIONS)	103
Rho(D)	103
TABLE 49 PROJECTED GLOBAL MARKET FOR RHO(D), THROUGH 2015 (\$ MILLIONS)	104
Hepatitis B Immune Globulin	104
TABLE 50 PROJECTED GLOBAL MARKET FOR HBV IMMUNOGLOBULINS, THROUGH 2015 (\$ MILLIONS)	104
CMV Immunoglobulin	105
TABLE 51 PROJECTED GLOBAL MARKET FOR CMV IMMUNOGLOBULIN, THROUGH 2015 (\$ MILLIONS)	105
Tetanus Immunoglobulin	105
TABLE 52 PROJECTED GLOBAL MARKET FOR TETANUS IMMUNOGLOBULIN, THROUGH 2015 (\$ MILLIONS)	106
Rabies Immunoglobulin	106
TABLE 53 PROJECTED GLOBAL MARKET FOR RABIES IMMUNOGLOBULIN, THROUGH 2015 (\$ MILLIONS)	107
Varicella Immunoglobulin	107
Vaccinia Immune Globulin Intravenous (VIG)	107
CHAPTER SIX: BLOOD INDUSTRY REGULATION	108
REGULATION OF THE U.S. BLOOD BUSINESS	108
TABLE 54 U.S. FEDERAL ORGANIZATIONS RESPONSIBLE FOR BLOOD SAFETY	108
TABLE 54 (CONTINUED)	109
STATUTORY AUTHORITY OF THE FDA	109
Center for Biologics Evaluation and Research	109
Office of Regulatory Affairs (ORA)	110
Office of Biologics, the Division of Blood and Blood Products	110
TABLE 55 FDA AUTHORITY IN REGULATING BLOOD BANKING AND BLOOD PRODUCTS	111
MAJOR REGULATIONS AND POLICIES FOR THE U.S. BLOOD SUPPLY	111
THE CLINICAL LABORATORY IMPROVEMENT ACT OF 1988 (CLIA)	111
THE FDA APPROACH TO BLOOD REGULATION	112
TABLE 56 MAIN BLOOD REGULATION ISSUES IDENTIFIED BY THE FDA	113
TEAM BIOLOGICS	113
REGULATION IMPLEMENTATION	114
TABLE 57 14 MAJOR AREAS OF CONCERN FOR INSPECTING BLOOD FACILITIES	114
TABLE 57 (CONTINUED)	115

OTHER U.S. ORGANIZATIONS INVOLVED IN BLOOD REGULATION	115
National Heart, Lung, and Blood Institute (NHLBI)	115
Blood Disease and Resources Program	116
Occupational Safety and Health Administration (OSHA)	116
Centers for Medicare and Medicaid Services (CMS)	116
State Regulatory Agencies	117
VOLUNTARY REGULATION BY PROFESSIONAL AND TRADE ASSOCIATIONS	117
American Association of Blood Banks (AABB)	117
National Donor Deferral Registry (NDDR)	118
Quality Plasma Program	118
America's Blood Centers (ABC)	119
Plasma Products Therapeutics Association (PPTA)	119
EUROPEAN UNION (EU) REGULATIONS	119
THE INTERNATIONAL SOCIETY FOR BLOOD TRANSFUSION (ISBT) 128	120
REGULATION IN JAPAN	120
REGULATION IN CHINA	120
THE FUTURE OF GLOBAL BLOOD REGULATIONS	121
 CHAPTER SEVEN: BLOOD PRODUCTS TECHNOLOGY	122
FRACTIONATION METHODS	122
COHN METHOD	122
ADVANCED FRACTIONATION METHODS	122
Chromatography Methods	123
AMPLIFICATION METHODS	123
POLYMERASE CHAIN REACTION	123
NUCLEI AMPLIFICATION TECHNOLOGY	123
IMMUNOASSAY METHODS	124
ENZYME IMMUNOASSAY	124
Basic EIA	124
<i>FIGURE 7 THE BASIC ENZYME IMMUNOASSAY (EIA) PROCESS</i>	125
Second Antibody Precipitation Method	125
Double Antibody Sandwich Method	126
Reverse Sandwich Method	126
Reverse Sandwich Inhibition Method	126
AGGLUTINATION	126
CHEMILUMINESCENCE (CHLIA)	127
ENDOTOXIN TESTING	127
 CHAPTER EIGHT: BLOOD RESEARCH AND DEVELOPMENT	128
JEROME H. HOLLAND LABORATORY (ARC)	128
NATIONAL BLOOD FOUNDATION (NBF)	128
CENTER FOR BLOOD RESEARCH (CBR)	128

STEM CELL RESEARCH AT THE CBR.....	129
FDA BLOOD RESEARCH PRODUCTS	130
<i>TABLE 58 SELECTED BLOOD RESEARCH FROM FDA, 2010</i>	<i>130</i>
<i>TABLE 58 (CONTINUED)</i>	<i>131</i>
STEM CELL DEVELOPMENTS OUTSIDE THE U.S.	132
NOVEL BIOENGINEERING TECHNOLOGIES	132
RESEARCH ON ALZHEIMER'S AND CIRRHOSIS OF THE LIVER.....	133
CURRENT RESEARCH ON BLOOD SUBSTITUTES	133
EMERGING PLATELET TREATMENTS.....	134
RED BLOOD CELLS	135
THE VETERINARY BLOOD MARKET	136
<i>TABLE 59 REGIONAL U.S. VETERINARY BLOOD BANKS</i>	<i>136</i>
CHAPTER NINE: PATENTS.....	137
<i>TABLE 60 RECENTLY ISSUED PATENTS, JANUARY 2005 THROUGH</i> <i>JANUARY 2011</i>	<i>137</i>
<i>TABLE 61 PATENTS BY COMPANY ASSIGNEE, JANUARY 2005</i> <i>THROUGH JANUARY 2011</i>	<i>138</i>
<i>TABLE 62 PATENTS ISSUED BETWEEN 2005 AND 2011: PLASMA</i> <i>DERIVATIVES</i>	<i>139</i>
<i>TABLE 63 PATENTS ISSUED BETWEEN 2005 AND 2011: BLOOD</i> <i>COLLECTION, SAMPLING EQUIPMENT</i>	<i>140</i>
<i>TABLE 63 (CONTINUED)</i>	<i>141</i>
<i>TABLE 63 (CONTINUED)</i>	<i>142</i>
<i>TABLE 63 (CONTINUED)</i>	<i>143</i>
<i>TABLE 63 (CONTINUED)</i>	<i>144</i>
<i>TABLE 63 (CONTINUED)</i>	<i>145</i>
<i>TABLE 64 PATENTS ISSUED BETWEEN 2005 AND 2011: BLOOD</i> <i>FILTRATION, FLUID SEPARATION EQUIPMENT</i>	<i>146</i>
<i>TABLE 64 (CONTINUED)</i>	<i>147</i>
<i>TABLE 64 (CONTINUED)</i>	<i>148</i>
<i>TABLE 64 (CONTINUED)</i>	<i>149</i>
<i>TABLE 64 (CONTINUED)</i>	<i>150</i>
<i>TABLE 64 (CONTINUED)</i>	<i>151</i>
<i>TABLE 64 (CONTINUED)</i>	<i>152</i>
<i>TABLE 65 PATENTS ISSUED BETWEEN 2005 AND 2011: BLOOD</i> <i>VOLUME ENHANCERS</i>	<i>153</i>
<i>TABLE 66 PATENTS ISSUED BETWEEN 2005 AND 2011: NUCLEIC</i> <i>ACID AMPLIFICATION</i>	<i>153</i>
<i>TABLE 66 (CONTINUED)</i>	<i>154</i>
<i>TABLE 67 PATENTS ISSUED BETWEEN 2005 AND 2011: BLOOD</i> <i>TREATMENTS</i>	<i>155</i>
<i>TABLE 67 (CONTINUED)</i>	<i>156</i>
<i>TABLE 68 PATENTS ISSUED BETWEEN 2005 AND 2011:</i> <i>ADDITIONAL POTENTIAL PRODUCTS</i>	<i>157</i>

<i>TABLE 68 (CONTINUED)</i>	158
<i>TABLE 68 (CONTINUED)</i>	159
<i>TABLE 68 (CONTINUED)</i>	160

CHAPTER TEN: COMPANY PROFILES	161
ABBOTT LABORATORIES.....	161
BUSINESS OVERVIEW.....	161
FINANCIALS	161
PRODUCTS	161
ALPHA THERAPEUTICS CORP. (SEE GRIFOLS)	162
AMERICA'S BLOOD CENTERS.....	162
BUSINESS OVERVIEW.....	162
FINANCIALS	162
PRODUCTS	163
AMERICAN ASSOCIATION OF BLOOD BANKS (AABB).....	163
BUSINESS OVERVIEW.....	163
FINANCIALS	163
PRODUCTS	163
AMERICAN RED CROSS	164
BUSINESS OVERVIEW.....	164
FINANCIALS	164
PRODUCTS	164
BAXTER INTERNATIONAL, INC.	165
BUSINESS OVERVIEW.....	165
FINANCIALS	165
PRODUCTS	165
BECKMAN COULTER.....	166
BUSINESS OVERVIEW.....	166
FINANCIALS	167
PRODUCTS	167
BECTON DICKINSON AND COMPANY	167
BUSINESS OVERVIEW.....	167
FINANCIALS	167
PRODUCTS	168
BIO PRODUCTS LABORATORIES	168
BUSINESS OVERVIEW.....	168
FINANCIALS	168
PRODUCTS	168
BIO-RAD LABORATORIES, INC.	169
BUSINESS OVERVIEW.....	169
FINANCIALS	169
PRODUCTS	169
BIOTEST AG.....	169
BUSINESS OVERVIEW.....	170
FINANCIALS	170

PRODUCTS	170
CARIDIANBCT INC.	170
BUSINESS OVERVIEW	171
FINANCIALS	171
PRODUCTS	171
CERUS CORP.	172
BUSINESS OVERVIEW	172
FINANCIALS	172
PRODUCTS	172
CHIRON CORP. (SEE NOVARTIS DIAGNOSTICS)	172
CSL BEHRING	172
BUSINESS OVERVIEW	173
FINANCIALS	173
PRODUCTS	173
DAXOR CORP.	174
BUSINESS OVERVIEW	174
FINANCIALS	174
PRODUCTS	174
DIAGAST	175
BUSINESS OVERVIEW	175
FINANCIALS	175
PRODUCTS	175
FENWAL BLOOD TECHNOLOGIES, INC.	176
BUSINESS OVERVIEW	176
FINANCIALS	176
PRODUCTS	176
FRESENIUS KABI AG	176
BUSINESS OVERVIEW	177
FINANCIALS	177
PRODUCTS	177
GEN-PROBE, INC.	177
BUSINESS OVERVIEW	177
FINANCIALS	178
PRODUCTS	178
GRIFOLS BIOLOGICALS, INC.	178
BUSINESS OVERVIEW	178
FINANCIALS	179
PRODUCTS	179
HAEMONETICS, INC.	179
BUSINESS OVERVIEW	179
FINANCIALS	180
PRODUCTS	180
Cell Saver System	181
OrthoPAT System	181

ACP 215 System	181
HEMAGEN DIAGNOSTICS, INC.	181
BUSINESS OVERVIEW	181
FINANCIALS	182
PRODUCTS	182
HEMOCUE AB	182
BUSINESS OVERVIEW	182
FINANCIALS	182
PRODUCTS	182
IMMUCOR, INC.	183
BUSINESS OVERVIEW	183
FINANCIALS	183
PRODUCTS	183
KAWASUMI LABORATORIES, INC.	183
BUSINESS OVERVIEW	184
FINANCIALS	184
PRODUCTS	184
LUMINEX CORPORATION	184
BUSINESS OVERVIEW	185
FINANCIALS	185
PRODUCTS	185
MACOPHARMA USA (FORMERLY UNITED PHARMA)	186
BUSINESS OVERVIEW	186
FINANCIALS	186
PRODUCTS	186
MASSACHUSETTS PUBLIC HEALTH BIOLOGIC LABS	186
BUSINESS OVERVIEW	186
FINANCIALS	187
PRODUCTS	187
NOVARTIS DIAGNOSTICS	187
BUSINESS OVERVIEW	187
FINANCIAL INFORMATION	188
PRODUCTS	188
NOVO NORDISK	189
BUSINESS OVERVIEW	189
FINANCIALS	189
PRODUCTS	189
OCTAPHARMA	189
BUSINESS OVERVIEW	190
FINANCIALS	190
PRODUCTS	190
OLYMPUS AMERICA, INC. (SEE BECKMAN COULTER)	190
ONE LAMBDA, INC.	190
BUSINESS OVERVIEW	190

FINANCIALS	191
PRODUCTS	191
ORTHO-CLINICAL DIAGNOSTICS	191
FINANCIALS	192
PRODUCTS	192
PALL CORP.	192
BUSINESS OVERVIEW	192
FINANCIALS	192
PRODUCTS	193
PFIZER	193
BUSINESS OVERVIEW	193
FINANCIALS	193
PRODUCTS	194
TALECRIS BIOTHERAPEUTICS	194
BUSINESS OVERVIEW	194
FINANCIALS	194
PRODUCTS	195
TERUMO MEDICAL CORP.	195
BUSINESS OVERVIEW	195
FINANCIALS	196
PRODUCTS	196
THERMOGENESIS CORP.	196
BUSINESS OVERVIEW	196
FINANCIALS	197
PRODUCTS	197