

FLOW CYTOMETRY: PRODUCTS, TECHNOLOGIES AND GLOBAL MARKETS



BIO085B
October 2013

Jackson Highsmith
Project Analyst

ISBN: 1-56965-616-9

bcc | Research
Market Forecasting

BCC Research
49 Walnut Park, Building 2
Wellesley, MA 02481
866-285-7215, 781-489-7301
www.bccresearch.com
Custom Reports:
carol.laverty@bccresearch.com

TABLE OF CONTENTS

TOPIC	PAGE NO.
CHAPTER 1 INTRODUCTION	2
STUDY BACKGROUND	2
STUDY GOALS AND OBJECTIVES	2
INTENDED AUDIENCE	2
SCOPE AND FORMAT	3
RESEARCH METHODOLOGY AND INFORMATION SOURCES	3
ANALYST CREDENTIALS	3
RELATED BCC RESEARCH REPORTS	4
BCC RESEARCH ON-LINE SERVICES	4
DISCLAIMER	4
CHAPTER 2 SUMMARY	6
<i>SUMMARY TABLE GLOBAL MARKET FOR FLOW CYTOMETRY PRODUCTS BY TYPE, THROUGH 2018 (\$ MILLIONS)</i>	6
<i>SUMMARY FIGURE GLOBAL MARKET FOR FLOW CYTOMETRY PRODUCTS BY TYPE, 2010-2018 (\$ MILLIONS)</i>	6
CHAPTER 3 MARKET OVERVIEW	9
CURRENT MARKET DYNAMICS	10
OUTLOOK THROUGH FORECAST PERIOD	10
MARKET DRIVERS	11
RECENT CONSOLIDATION WITHIN THE INDUSTRY	11
PRODUCT/TECHNOLOGY INNOVATIONS	11
EMERGING MAINSTREAM ROLE IN DRUG DISCOVERY AND DEVELOPMENT	12
WIDE RANGE OF APPLICATIONS	12
CONTRACT RESEARCH AND CLINICAL TRIAL ORGANIZATIONS	12
EXPECTED FURTHER M&A ACTIVITY WITHIN THE INDUSTRY	13
HIGH COST OF INSTRUMENTS	13
LACK OF AWARENESS	14
REQUIREMENT OF HIGHLY TRAINED PERSONNEL	14
OPPORTUNITIES	14
EVOLUTION OF FLOW CYTOMETRY	15
ANALYSIS OF FLOW CYTOMETRY'S CAPABILITIES	15
FLOW CYTOMETRY IMMUNOPHENOTYPING	17
<i>FIGURE 1 FLOW CYTOMETRY IMMUNOPHENOTYPING VERSUS CONVENTIONAL MICROSCOPY-BASED IMMUNOPHENOTYPING TECHNIQUES</i>	18
<i>FIGURE 2 DISEASE, DIAGNOSIS AND MANAGEMENT POTENTIAL OF FLOW CYTOMETRY IMMUNOPHENOTYPING</i>	19
USE OF FLOW CYTOMETRY IN RESOURCE-POOR REGIONS IS GAINING IMPORTANCE	20
ACQUISITION SUMMARY AND MARKET IMPLICATIONS	20
Danaher Purchase of Beckman Coulter	20
Beckman Coulter Life Sciences Acquires ReaMetrix	21
BD Acquires Accuri Cytometers	21
ANALYSES: KEY PLAYERS, COMPETITORS AND MARKET	22
<i>FIGURE 3 GLOBAL FLOW CYTOMETRY MARKET SHARES BY PRODUCT TYPE, 2013 (%)</i>	23

TOPIC	PAGE NO.
<i>FIGURE 4 ANALYSIS OF MARKET PLAYERS—STRATEGIES AND DEVELOPMENTS, 2006-2013</i>	23
EMERGING ECONOMIES AND TECHNOLOGY ADOPTION	26
STRATEGIC RECOMMENDATIONS	27
PATENT ANALYSIS	27
<i>FIGURE 5 PATENT ANALYSIS BY TYPE OF PRODUCT, 2011-2012 (%)</i>	28
<i>FIGURE 6 PATENTS BY REGION, 2011-2012 (%)</i>	29
CHAPTER 4 GLOBAL MARKET FOR FLOW CYTOMETRY PRODUCTS	31
<i>TABLE 1 GLOBAL FLOW CYTOMETRY MARKET BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	31
MARKET FOR FLOW CYTOMETRY INSTRUMENTS	31
<i>TABLE 2 GLOBAL MARKET FOR FLOW CYTOMETRY INSTRUMENTS, THROUGH 2018 (\$ MILLIONS)</i>	32
<i>TABLE 3 GLOBAL MARKET FOR FLOW CYTOMETRY INSTRUMENTS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	32
MARKET DRIVERS	33
TECHNOLOGICAL ADVANCES IN INSTRUMENT COMPONENTS ARE BOOSTING DEMAND	33
GROWING ADOPTION OF BENCHTOP FLOW CYTOMETERS	33
MARKET RESTRAINTS	34
MAINTENANCE AND SERVICES COSTS	34
CYTOMETRY PLATFORMS	34
<i>TABLE 4 GLOBAL MARKET FOR FLOW CYTOMETRY PLATFORMS, THROUGH 2018 (\$ MILLIONS)</i>	35
<i>TABLE 5 GLOBAL MARKET FOR FLOW CYTOMETRY PLATFORMS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	35
FLOW CYTOMETRY CELL SORTERS	35
<i>TABLE 6 GLOBAL MARKET FOR FLOW CYTOMETRY CELL SORTERS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	36
FLOW CYTOMETRY ANALYZERS	36
<i>TABLE 7 GLOBAL MARKET FOR FLOW CYTOMETRY ANALYZERS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	36
REPLACEABLE COMPONENTS	37
<i>TABLE 8 GLOBAL MARKET FOR THE REPLACEABLE COMPONENTS OF FLOW CYTOMETERS, THROUGH 2018 (\$ MILLIONS)</i>	37
<i>TABLE 9 GLOBAL MARKET FOR THE REPLACEABLE COMPONENTS OF FLOW CYTOMETERS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	37
FILTERS	38
<i>TABLE 10 GLOBAL MARKET FOR REPLACEABLE FILTERS USED IN FLOW CYTOMETERS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	38
LASERS	38
<i>TABLE 11 GLOBAL MARKET FOR FLOW CYTOMETRY LASERS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	39
DETECTORS	39
<i>TABLE 12 GLOBAL MARKET FOR FLOW CYTOMETRY DETECTORS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	39
OTHERS	40
<i>TABLE 13 GLOBAL MARKET FOR OTHER REPLACEABLE COMPONENTS OF FLOW CYTOMETERS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	40

TOPIC	PAGE NO.
FLOW CYTOMETRY SYSTEMS AND DEVICES	40
<i>TABLE 14 GLOBAL MARKET FOR FLOW CYTOMETRY SYSTEMS AND DEVICES BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	41
MARKET FOR FLOW CYTOMETRY REAGENTS AND CONSUMABLES	41
<i>TABLE 15 GLOBAL MARKET FOR FLOW CYTOMETRY REAGENTS, THROUGH 2018 (\$ MILLIONS)</i>	41
<i>TABLE 16 GLOBAL MARKET FOR FLOW CYTOMETRY REAGENTS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	42
DRIVERS AND CHALLENGES	42
ANTIBODIES	42
<i>TABLE 17 GLOBAL MARKET FOR FLOW CYTOMETRY ANTIBODIES BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	43
DYES AND FLUOROCHROMES	43
<i>TABLE 18 GLOBAL MARKET FOR FLOW CYTOMETRY DYES BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	44
BEADS	44
<i>TABLE 19 GLOBAL MARKET FOR FLOW CYTOMETRY BEADS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	45
OTHERS	45
<i>TABLE 20 GLOBAL MARKET FOR OTHER FLOW CYTOMETRY REAGENTS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	45
SOFTWARE MARKET	45
<i>TABLE 21 GLOBAL MARKET FOR FLOW CYTOMETRY SOFTWARE BY TYPE, THROUGH 2018 (\$ MILLIONS)</i>	46
<i>TABLE 22 GLOBAL FLOW CYTOMETRY SOFTWARE MARKET BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	46
WITHIN-SYSTEM SOFTWARE	47
<i>TABLE 23 GLOBAL MARKET FOR WITHIN-SYSTEM FLOW CYTOMETRY SOFTWARE BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	47
THIRD-PARTY SOFTWARE	47
<i>TABLE 24 GLOBAL MARKET FOR THIRD-PARTY FLOW CYTOMETRY SOFTWARE BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	48
SERVICES	48
<i>TABLE 25 GLOBAL FLOW CYTOMETRY SERVICE MARKET BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	48
CHAPTER 5 GLOBAL MARKET FOR APPLICATIONS OF FLOW CYTOMETRY	51
<i>TABLE 26 GLOBAL FLOW CYTOMETRY MARKET BY APPLICATION, THROUGH 2018 (\$ MILLIONS)</i>	51
<i>TABLE 27 GLOBAL MARKET FOR FLOW CYTOMETRY APPLICATIONS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	52
MARKET DRIVERS	52
GOVERNMENT INITIATIVES AND AVAILABILITY OF RESEARCH FUNDING	52
PRESSING NEED FOR PATIENT AND DISEASE MANAGEMENT	52
EXPANDING END-USER BASE	53
NEED FOR HIGH-THROUGHPUT SCREENING/HIGH-CONTENT SCREENING	53
MARKET RESTRAINTS	54
FLOW CYTOMETRY REQUIRES A HIGH DEGREE OF CLINICAL AND MANUFACTURING EXPERTISE	54
RESEARCH APPLICATIONS	54

TOPIC	PAGE NO.
<i>TABLE 28 GLOBAL MARKET FOR FLOW CYTOMETRY IN RESEARCH APPLICATIONS, THROUGH 2018 (\$ MILLIONS)</i>	54
<i>TABLE 29 GLOBAL MARKET FOR FLOW CYTOMETRY IN RESEARCH APPLICATIONS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	55
CELL CYCLE ANALYSIS AND CELL PROLIFERATION	55
<i>TABLE 30 GLOBAL MARKET FOR THE APPLICATION OF FLOW CYTOMETRY IN CELL CYCLE ANALYSIS AND CELL PROLIFERATION BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	56
APOPTOSIS	56
<i>TABLE 31 GLOBAL MARKET FOR THE APPLICATION OF FLOW CYTOMETRY IN THE ANALYSIS OF APOPTOSIS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	56
CELL SORTING	57
<i>TABLE 32 GLOBAL MARKET FOR CELL SORTING BY FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	57
TRANSFECTION AND CELL VIABILITY	58
<i>TABLE 33 GLOBAL MARKET FOR THE APPLICATION OF FLOW CYTOMETRY IN ANALYZING TRANSFECTION AND CELL VIABILITY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	58
OTHERS	58
<i>TABLE 34 GLOBAL MARKET FOR OTHER APPLICATIONS OF FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	59
CLINICAL APPLICATIONS	59
<i>TABLE 35 GLOBAL MARKET FOR CLINICAL APPLICATIONS OF FLOW CYTOMETRY, THROUGH 2018 (\$ MILLIONS)</i>	59
<i>TABLE 36 GLOBAL MARKET FOR CLINICAL APPLICATIONS OF FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	60
ORGAN TRANSPLANTATION	60
<i>TABLE 37 GLOBAL MARKET FOR CLINICAL APPLICATIONS OF FLOW CYTOMETRY IN ORGAN TRANSPLANTS BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	61
HEMATOLOGY	61
<i>TABLE 38 GLOBAL MARKET FOR CLINICAL APPLICATIONS OF FLOW CYTOMETRY IN HEMATOLOGY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	62
CANCER AND SOLID TUMOR IMMUNOLOGY	62
<i>TABLE 39 GLOBAL MARKET FOR CLINICAL APPLICATIONS OF FLOW CYTOMETRY IN ONCOLOGY AND TUMOR IMMUNOLOGY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	63
IMMUNODEFICIENCY DISEASE-HIV INFECTION	63
<i>TABLE 40 GLOBAL MARKET FOR THE CLINICAL APPLICATION OF FLOW CYTOMETRY IN HIV BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	64
OTHERS	64
<i>TABLE 41 GLOBAL MARKET FOR "OTHER" CLINICAL APPLICATIONS OF FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	64
CHAPTER 6 GLOBAL MARKET FOR FLOW CYTOMETRY TECHNOLOGY	67
FLOW CYTOMETRY TECHNOLOGY	67
<i>TABLE 42 GLOBAL MARKET FOR FLOW CYTOMETRY BY TECHNOLOGY, THROUGH 2018 (\$ MILLIONS)</i>	67
<i>TABLE 43 GLOBAL MARKET FOR FLOW CYTOMETRY TECHNOLOGY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	68
CELL-BASED FLOW CYTOMETRY	68
<i>TABLE 44 GLOBAL MARKET FOR CELL-BASED FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	69

TOPIC	PAGE NO.
Drivers	69
Increasing HIV/AIDS Awareness	69
Several Clinical Applications	69
BEAD-BASED FLOW CYTOMETRY	69
<i>TABLE 45 GLOBAL MARKET FOR BEAD-BASED FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	70
Market Drivers	70
Rapid Progress and Increasing Application in Proteomics	70
Application in Genomics	70
Competitive Edge over ELISA Technique and Microarrays	71
Market Restraints	71
Obtaining Quality Data Poses a Challenge	71
CHAPTER 7 FLOW CYTOMETRY END-USER MARKET	74
FLOW CYTOMETRY END-USER MARKET	74
<i>FIGURE 7 GLOBAL MARKET FOR FLOW CYTOMETRY BY TYPE OF END USER, 2013 AND 2018 (%)</i>	74
<i>TABLE 46 GLOBAL MARKET FOR FLOW CYTOMETRY BY TYPE OF END USER, THROUGH 2018 (\$ MILLIONS)</i>	76
<i>TABLE 47 GLOBAL FLOW CYTOMETRY END-USER MARKET BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	76
COMMERCIAL ORGANIZATIONS	76
<i>TABLE 48 GLOBAL COMMERCIAL END-USER MARKET FOR FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	77
ACADEMIC INSTITUTIONS	77
<i>TABLE 49 GLOBAL ACADEMIC END-USER MARKET FOR FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	78
HOSPITALS	78
<i>TABLE 50 GLOBAL HOSPITAL END-USER MARKET FOR FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	79
MEDICAL SCHOOLS AND CLINICAL TESTING LABS	79
<i>TABLE 51 GLOBAL MEDICAL SCHOOL/CLINICAL LABORATORY END-USER MARKET FOR FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	79
OTHERS	80
<i>TABLE 52 GLOBAL MARKET FOR "OTHER" END USERS OF FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)</i>	80
CHAPTER 8 COMPETITIVE LANDSCAPE	82
<i>FIGURE 8 DEVELOPMENTS IN GLOBAL FLOW CYTOMETRY MARKET, 2010 TO JUNE 2013 (%)</i>	82
RECENT FLOW CYTOMETRY INDUSTRY DEVELOPMENTS	83
ACQUISITIONS	83
PRODUCT LAUNCHES	84
AGREEMENTS/PARTNERSHIPS/COLLABORATIONS	85
CHAPTER 9 GEOGRAPHIC ANALYSIS OF THE GLOBAL FLOW CYTOMETRY MARKET	87
GEOGRAPHIC ANALYSIS	87
<i>FIGURE 9 TOTAL FLOW CYTOMETRY MARKET BY REGION, 2013 AND 2018 (%)</i>	88
UNITED STATES	89

TOPIC	PAGE NO.
<i>TABLE 53 U.S. FLOW CYTOMETRY MARKET, THROUGH 2018 (\$ MILLIONS)</i>	89
EUROPE	89
<i>TABLE 54 EUROPEAN FLOW CYTOMETRY MARKET, THROUGH 2018 (\$ MILLIONS)</i>	90
ASIA AND ROW	90
<i>TABLE 55 ASIA AND ROW FLOW CYTOMETRY MARKET, THROUGH 2018 (\$ MILLIONS)</i>	91
CHAPTER 10 COMPANY PROFILES	93
ADVANCED ANALYTICAL TECHNOLOGIES INC.	93
<i>TABLE 56 RECENT DEVELOPMENTS—ADVANCED ANALYTICAL TECHNOLOGIES</i>	94
ALPCO DIAGNOSTICS	94
<i>TABLE 57 RECENT DEVELOPMENTS-ALPCO DIAGNOSTICS</i>	95
APOGEE FLOW SYSTEMS	95
APPLIED CYTOMETRY	96
<i>TABLE 58 RECENT DEVELOPMENTS—APPLIED CYTOMETRY</i>	97
BANGS LABORATORY INC. (BLI)	97
<i>TABLE 59 RECENT DEVELOPMENTS—BANGS LABORATORY INC. (BLI)</i>	98
BECKMAN COULTER INC.	98
<i>TABLE 60 RECENT DEVELOPMENTS—BECKMAN COULTER INC.</i>	100
BECTON, DICKINSON AND CO.	101
<i>TABLE 61 RECENT DEVELOPMENTS—BECTON, DICKINSON AND CO.</i>	102
BIOCYTEX	104
BIOLEGEND	104
<i>TABLE 62 RECENT DEVELOPMENTS—BIOLEGEND</i>	105
BIO-RAD/ABD SEROTEC	105
<i>TABLE 63 RECENT DEVELOPMENTS—BIO-RAD/ABD SEROTEC</i>	106
BIOVISION INC.	107
CELL SIGNALING TECHNOLOGY	107
<i>TABLE 64 RECENT DEVELOPMENTS—CELL SIGNALING TECHNOLOGY (CST)</i>	108
CYTEK DEVELOPMENT INC.	109
DAKO DENMARK A/S	110
<i>TABLE 65 RECENT DEVELOPMENTS—DAKO</i>	110
EBIOSCIENCE INC.	111
<i>TABLE 66 RECENT DEVELOPMENTS—EBIOSCIENCE</i>	112
EMD MILLIPORE	113
<i>TABLE 67 RECENT DEVELOPMENTS—EMD MILLIPORE</i>	114
INTELLICYT CORP.	115
<i>TABLE 68 RECENT DEVELOPMENTS-INTELLICYT CORP.</i>	115
LIFE TECHNOLOGIES CORP.	116
<i>TABLE 69 RECENT DEVELOPMENTS—LIFE TECHNOLOGIES CORP.</i>	117
LUMINEX CORP.	118
<i>TABLE 70 RECENT DEVELOPMENTS-LUMINEX CORP.</i>	118
MILTENYI BIOTEC	120
<i>TABLE 71 RECENT DEVELOPMENTS-MILTENYI BIOTEC</i>	121
MORPHOSYS AG	122
<i>TABLE 72 RECENT DEVELOPMENTS—MORPHOSYS</i>	122
PARTEC GMBH	123
POINTCARE TECHNOLOGIES INC.	124

TOPIC	PAGE NO.
<i>TABLE 73 RECENT DEVELOPMENTS-POINTCARE TECHNOLOGIES INC.</i>	124
PROMEGA CORP.	124
<i>TABLE 74 RECENT DEVELOPMENTS—PROMEGA CORP.</i>	125
R&D SYSTEMS INC.	126
SANTA CRUZ BIOTECHNOLOGY INC.	127
SIGMA-ALDRICH CORP.	127
<i>TABLE 75 RECENT DEVELOPMENTS-SIGMA-ALDRICH CORP.</i>	128
SOUTHERN BIOTECH	130
UNION BIOMETRICA INC.	130
CHAPTER 11 APPENDIX LIST OF PATENTS	133
<i>TABLE 76 U.S. PATENTS AND PATENT APPLICATIONS</i>	133
<i>TABLE 77 EUROPEAN PATENTS</i>	138
<i>TABLE 78 JAPANESE PATENTS</i>	140

LIST OF TABLES

TABLE HEADING	PAGE NO.
SUMMARY TABLE GLOBAL MARKET FOR FLOW CYTOMETRY PRODUCTS BY TYPE, THROUGH 2018 (\$ MILLIONS)	6
TABLE 1 GLOBAL FLOW CYTOMETRY MARKET BY REGION, THROUGH 2018 (\$ MILLIONS)	31
TABLE 2 GLOBAL MARKET FOR FLOW CYTOMETRY INSTRUMENTS, THROUGH 2018 (\$ MILLIONS)	32
TABLE 3 GLOBAL MARKET FOR FLOW CYTOMETRY INSTRUMENTS BY REGION, THROUGH 2018 (\$ MILLIONS)	32
TABLE 4 GLOBAL MARKET FOR FLOW CYTOMETRY PLATFORMS, THROUGH 2018 (\$ MILLIONS)	35
TABLE 5 GLOBAL MARKET FOR FLOW CYTOMETRY PLATFORMS BY REGION, THROUGH 2018 (\$ MILLIONS)	35
TABLE 6 GLOBAL MARKET FOR FLOW CYTOMETRY CELL SORTERS BY REGION, THROUGH 2018 (\$ MILLIONS)	36
TABLE 7 GLOBAL MARKET FOR FLOW CYTOMETRY ANALYZERS BY REGION, THROUGH 2018 (\$ MILLIONS)	36
TABLE 8 GLOBAL MARKET FOR THE REPLACEABLE COMPONENTS OF FLOW CYTOMETERS, THROUGH 2018 (\$ MILLIONS)	37
TABLE 9 GLOBAL MARKET FOR THE REPLACEABLE COMPONENTS OF FLOW CYTOMETERS BY REGION, THROUGH 2018 (\$ MILLIONS)	37
TABLE 10 GLOBAL MARKET FOR REPLACEABLE FILTERS USED IN FLOW CYTOMETERS BY REGION, THROUGH 2018 (\$ MILLIONS)	38
TABLE 11 GLOBAL MARKET FOR FLOW CYTOMETRY LASERS BY REGION, THROUGH 2018 (\$ MILLIONS)	39
TABLE 12 GLOBAL MARKET FOR FLOW CYTOMETRY DETECTORS BY REGION, THROUGH 2018 (\$ MILLIONS)	39
TABLE 13 GLOBAL MARKET FOR OTHER REPLACEABLE COMPONENTS OF FLOW CYTOMETERS BY REGION, THROUGH 2018 (\$ MILLIONS)	40
TABLE 14 GLOBAL MARKET FOR FLOW CYTOMETRY SYSTEMS AND DEVICES BY REGION, THROUGH 2018 (\$ MILLIONS)	41
TABLE 15 GLOBAL MARKET FOR FLOW CYTOMETRY REAGENTS, THROUGH 2018 (\$ MILLIONS)	41
TABLE 16 GLOBAL MARKET FOR FLOW CYTOMETRY REAGENTS BY REGION, THROUGH 2018 (\$ MILLIONS)	42
TABLE 17 GLOBAL MARKET FOR FLOW CYTOMETRY ANTIBODIES BY REGION, THROUGH 2018 (\$ MILLIONS)	43
TABLE 18 GLOBAL MARKET FOR FLOW CYTOMETRY DYES BY REGION, THROUGH 2018 (\$ MILLIONS)	44
TABLE 19 GLOBAL MARKET FOR FLOW CYTOMETRY BEADS BY REGION, THROUGH 2018 (\$ MILLIONS)	45
TABLE 20 GLOBAL MARKET FOR OTHER FLOW CYTOMETRY REAGENTS BY REGION, THROUGH 2018 (\$ MILLIONS)	45
TABLE 21 GLOBAL MARKET FOR FLOW CYTOMETRY SOFTWARE BY TYPE, THROUGH 2018 (\$ MILLIONS)	46
TABLE 22 GLOBAL FLOW CYTOMETRY SOFTWARE MARKET BY REGION, THROUGH 2018 (\$ MILLIONS)	46
TABLE 23 GLOBAL MARKET FOR WITHIN-SYSTEM FLOW CYTOMETRY SOFTWARE BY REGION, THROUGH 2018 (\$ MILLIONS)	47
TABLE 24 GLOBAL MARKET FOR THIRD-PARTY FLOW CYTOMETRY SOFTWARE BY REGION, THROUGH 2018 (\$ MILLIONS)	48

TABLE HEADING	PAGE NO.
TABLE 25 GLOBAL FLOW CYTOMETRY SERVICE MARKET BY REGION, THROUGH 2018 (\$ MILLIONS)	48
TABLE 26 GLOBAL FLOW CYTOMETRY MARKET BY APPLICATION, THROUGH 2018 (\$ MILLIONS)	51
TABLE 27 GLOBAL MARKET FOR FLOW CYTOMETRY APPLICATIONS BY REGION, THROUGH 2018 (\$ MILLIONS)	52
TABLE 28 GLOBAL MARKET FOR FLOW CYTOMETRY IN RESEARCH APPLICATIONS, THROUGH 2018 (\$ MILLIONS)	54
TABLE 29 GLOBAL MARKET FOR FLOW CYTOMETRY IN RESEARCH APPLICATIONS BY REGION, THROUGH 2018 (\$ MILLIONS)	55
TABLE 30 GLOBAL MARKET FOR THE APPLICATION OF FLOW CYTOMETRY IN CELL CYCLE ANALYSIS AND CELL PROLIFERATION BY REGION, THROUGH 2018 (\$ MILLIONS)	56
TABLE 31 GLOBAL MARKET FOR THE APPLICATION OF FLOW CYTOMETRY IN THE ANALYSIS OF APOPTOSIS BY REGION, THROUGH 2018 (\$ MILLIONS)	56
TABLE 32 GLOBAL MARKET FOR CELL SORTING BY FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	57
TABLE 33 GLOBAL MARKET FOR THE APPLICATION OF FLOW CYTOMETRY IN ANALYZING TRANSFECTION AND CELL VIABILITY BY REGION, THROUGH 2018 (\$ MILLIONS)	58
TABLE 34 GLOBAL MARKET FOR OTHER APPLICATIONS OF FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	59
TABLE 35 GLOBAL MARKET FOR CLINICAL APPLICATIONS OF FLOW CYTOMETRY, THROUGH 2018 (\$ MILLIONS)	59
TABLE 36 GLOBAL MARKET FOR CLINICAL APPLICATIONS OF FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	60
TABLE 37 GLOBAL MARKET FOR CLINICAL APPLICATIONS OF FLOW CYTOMETRY IN ORGAN TRANSPLANTS BY REGION, THROUGH 2018 (\$ MILLIONS)	61
TABLE 38 GLOBAL MARKET FOR CLINICAL APPLICATIONS OF FLOW CYTOMETRY IN HEMATOLOGY BY REGION, THROUGH 2018 (\$ MILLIONS)	62
TABLE 39 GLOBAL MARKET FOR CLINICAL APPLICATIONS OF FLOW CYTOMETRY IN ONCOLOGY AND TUMOR IMMUNOLOGY BY REGION, THROUGH 2018 (\$ MILLIONS)	63
TABLE 40 GLOBAL MARKET FOR THE CLINICAL APPLICATION OF FLOW CYTOMETRY IN HIV BY REGION, THROUGH 2018 (\$ MILLIONS)	64
TABLE 41 GLOBAL MARKET FOR "OTHER" CLINICAL APPLICATIONS OF FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	64
TABLE 42 GLOBAL MARKET FOR FLOW CYTOMETRY BY TECHNOLOGY, THROUGH 2018 (\$ MILLIONS)	67
TABLE 43 GLOBAL MARKET FOR FLOW CYTOMETRY TECHNOLOGY BY REGION, THROUGH 2018 (\$ MILLIONS)	68
TABLE 44 GLOBAL MARKET FOR CELL-BASED FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	69
TABLE 45 GLOBAL MARKET FOR BEAD-BASED FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	70
TABLE 46 GLOBAL MARKET FOR FLOW CYTOMETRY BY TYPE OF END USER, THROUGH 2018 (\$ MILLIONS)	76
TABLE 47 GLOBAL FLOW CYTOMETRY END-USER MARKET BY REGION, THROUGH 2018 (\$ MILLIONS)	76
TABLE 48 GLOBAL COMMERCIAL END-USER MARKET FOR FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	77
TABLE 49 GLOBAL ACADEMIC END-USER MARKET FOR FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	78

TABLE HEADING	PAGE NO.
TABLE 50 GLOBAL HOSPITAL END-USER MARKET FOR FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	79
TABLE 51 GLOBAL MEDICAL SCHOOL/CLINICAL LABORATORY END-USER MARKET FOR FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	79
TABLE 52 GLOBAL MARKET FOR "OTHER" END USERS OF FLOW CYTOMETRY BY REGION, THROUGH 2018 (\$ MILLIONS)	80
TABLE 53 U.S. FLOW CYTOMETRY MARKET, THROUGH 2018 (\$ MILLIONS)	89
TABLE 54 EUROPEAN FLOW CYTOMETRY MARKET, THROUGH 2018 (\$ MILLIONS)	90
TABLE 55 ASIA AND ROW FLOW CYTOMETRY MARKET, THROUGH 2018 (\$ MILLIONS)	91
TABLE 56 RECENT DEVELOPMENTS—ADVANCED ANALYTICAL TECHNOLOGIES	94
TABLE 57 RECENT DEVELOPMENTS—ALPCO DIAGNOSTICS	95
TABLE 58 RECENT DEVELOPMENTS—APPLIED CYTOMETRY	97
TABLE 59 RECENT DEVELOPMENTS—BANGS LABORATORY INC. (BLI)	98
TABLE 60 RECENT DEVELOPMENTS—BECKMAN COULTER INC.	100
TABLE 61 RECENT DEVELOPMENTS—BECTON, DICKINSON AND CO.	102
TABLE 62 RECENT DEVELOPMENTS—BIOLEGEND	105
TABLE 63 RECENT DEVELOPMENTS—BIO-RAD/ABD SEROTEC	106
TABLE 64 RECENT DEVELOPMENTS—CELL SIGNALING TECHNOLOGY (CST)	108
TABLE 65 RECENT DEVELOPMENTS—DAKO	110
TABLE 66 RECENT DEVELOPMENTS—EBIOSCIENCE	112
TABLE 67 RECENT DEVELOPMENTS—EMD MILLIPORE	114
TABLE 68 RECENT DEVELOPMENTS—INTELLICYT CORP.	115
TABLE 69 RECENT DEVELOPMENTS—LIFE TECHNOLOGIES CORP.	117
TABLE 70 RECENT DEVELOPMENTS—LUMINEX CORP.	118
TABLE 71 RECENT DEVELOPMENTS—MILTENYI BIOTEC	121
TABLE 72 RECENT DEVELOPMENTS—MORPHOSYS	122
TABLE 73 RECENT DEVELOPMENTS—POINTCARE TECHNOLOGIES INC.	124
TABLE 74 RECENT DEVELOPMENTS—PROMEGA CORP.	125
TABLE 75 RECENT DEVELOPMENTS—SIGMA-ALDRICH CORP.	128
TABLE 76 U.S. PATENTS AND PATENT APPLICATIONS	133
TABLE 77 EUROPEAN PATENTS	138
TABLE 78 JAPANESE PATENTS	140

LIST OF FIGURES

FIGURE TITLE	PAGE NO.
SUMMARY FIGURE GLOBAL MARKET FOR FLOW CYTOMETRY PRODUCTS BY TYPE, 2010-2018 (\$ MILLIONS)	6
FIGURE 1 FLOW CYTOMETRY IMMUNOPHENOTYPING VERSUS CONVENTIONAL MICROSCOPY-BASED IMMUNOPHENOTYPING TECHNIQUES	18
FIGURE 2 DISEASE, DIAGNOSIS AND MANAGEMENT POTENTIAL OF FLOW CYTOMETRY IMMUNOPHENOTYPING	19
FIGURE 3 GLOBAL FLOW CYTOMETRY MARKET SHARES BY PRODUCT TYPE, 2013 (%)	23
FIGURE 4 ANALYSIS OF MARKET PLAYERS—STRATEGIES AND DEVELOPMENTS, 2006-2013	23
FIGURE 5 PATENT ANALYSIS BY TYPE OF PRODUCT, 2011-2012 (%)	28
FIGURE 6 PATENTS BY REGION, 2011-2012 (%)	29
FIGURE 7 GLOBAL MARKET FOR FLOW CYTOMETRY BY TYPE OF END USER, 2013 AND 2018 (%)	74
FIGURE 8 DEVELOPMENTS IN GLOBAL FLOW CYTOMETRY MARKET, 2010 TO JUNE 2013 (%)	82
FIGURE 9 TOTAL FLOW CYTOMETRY MARKET BY REGION, 2013 AND 2018 (%)	88