

CHAPTER ONE: INTRODUCTION.....	1
STUDY OBJECTIVES.....	1
REASONS FOR DOING THIS STUDY.....	1
INTENDED AUDIENCE.....	2
SCOPE OF THE STUDY.....	2
METHODOLOGY.....	2
INFORMATION SOURCES.....	2
BCC ONLINE SERVICES.....	2
ABOUT THE AUTHOR.....	3
RELATED BCC RESEARCH REPORTS.....	3
DISCLAIMER.....	4
 CHAPTER TWO: EXECUTIVE SUMMARY.....	 5
EXECUTIVE SUMMARY.....	5
<i>SUMMARY TABLE GLOBAL REVENUE FOR DRUGS USED TO TREAT LIVER DISEASES BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	 6
<i>SUMMARY FIGURE GLOBAL REVENUE FOR DRUGS USED TO TREAT LIVER DISEASES BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	 7
 CHAPTER THREE: OVERVIEW.....	 8
DEFINITIONS.....	8
LIVER.....	8
FUNCTIONS OF LIVER.....	9
PRODUCTION OF BILE.....	9
STORAGE OF FATS, CARBOHYDRATES, PROTEINS, VITAMINS, AND MINERALS.....	10
REGULATION OF NECESSARY SUBSTANCES IN THE BLOOD.....	10
SYNTHESIS OF COAGULATING PROTEINS.....	10
REMOVAL OF HARMFUL SUBSTANCES.....	11
OTHER FUNCTIONS.....	11
COMMON SYMPTOMS OF LIVER DISEASE.....	11
FATIGUE.....	12
JAUNDICE.....	12
SWOLLEN ABDOMEN.....	12
EFFECTS OF HORMONAL IMBALANCE.....	12
STOOL ABNORMALITIES.....	13
POLYDYPسيا AND POLYURIA.....	13
HEPATIC ENCEPHALOPATHY.....	13
SEXUAL DYSFUNCTION.....	13
NON-SPECIFIC SYMPTOMS OF LIVER DISEASE.....	13
LIVER DISEASE.....	14
<i>TABLE 1 CLASSIFICATION OF LIVER DISEASE</i> .....	 14

TOXIC INJURY TO THE LIVER.....	15
Drug –induced Liver Disease.....	15
Industrial and Environmental Toxin.....	15
Alcoholic.....	15
Postoperative Hepatic Dysfunction.....	15
INFECTIOUS AGENTS AND PARASITES.....	16
Hepatitis Virus.....	16
Hepatitis A.....	16
Hepatitis B.....	16
Hepatitis C.....	16
Hepatitis D.....	17
Hepatitis E.....	17
Neonatal Hepatitis.....	17
Bacterial and Other Pathogenic Agents.....	17
Parasites.....	18
IMMUNE DISORDERS.....	18
Autoimmune Hepatitis.....	18
Primary Biliary Cirrhosis.....	18
TUMORS.....	19
Primary Malignant Tumors.....	19
Metastatic Malignant Tumors.....	20
Benign Hepatic Tumors.....	20
Tumor-like Lesions.....	20
INHERITED LIVER DISEASES.....	21
Wilson’s Disease.....	21
Alagille Syndrome.....	21
Hemochromatosis.....	22
Inborn Errors.....	23
Alpha-1-antitrypsin Deficiency.....	23
Cysts.....	24
Galactosemia.....	24
Gilbert’s Syndrome.....	24
Tyrosinemia.....	25
MISCELLANEOUS.....	26
Non-alcoholic Fatty Liver Disease.....	26
Biliary Atresia.....	26
Cirrhosis.....	27
Hepatic Encephalopathy.....	28
Variceal Bleeding.....	29
Fatty Liver Disease.....	30
Gallstones.....	31
Reye’s Syndrome.....	32
Sarcoidosis.....	32

CHAPTER FOUR: CLASSIFICATION OF THERAPIES BY DISEASE AND PRODUCTS ON THE MARKET .....	33
VIRUS-INDUCED LIVER DISEASE AND HEPATITIS.....	33
VIRAL VACCINES.....	33
<i>TABLE 2 VACCINES FOR HEPATITIS A PREVENTION.....</i>	<i>33</i>
<i>TABLE 3 VACCINES FOR HEPATITIS B PREVENTION.....</i>	<i>34</i>
ANTIVIRAL DRUGS .....	34
Nucleoside Analogs.....	34
<i>TABLE 4 NUCLEOSIDE ANALOGS USED TO TREAT HEPATITIS.....</i>	<i>35</i>
Nucleotide Analogs.....	35
<i>TABLE 5 NUCLEOTIDE ANALOGS USED TO TREAT HEPATITIS.....</i>	<i>35</i>
Interferon .....	35
<i>TABLE 6 INTERFERONS USED TO TREAT HEPATITIS .....</i>	<i>36</i>
Protease Inhibitors .....	36
<i>TABLE 7 PROTEASE INHIBITORS USED TO TREAT HEPATITIS.....</i>	<i>37</i>
IMMUNE GLOBULINS.....	37
<i>TABLE 8 IMMUNE GLOBULINS USED TO TREAT HEPATITIS.....</i>	<i>37</i>
LIVER TUMORS AND LIVER CANCER.....	38
CHEMOTHERAPEUTIC DRUGS.....	39
<i>TABLE 9 CHEMOTHERAPEUTIC DRUGS USED TO TREAT LIVER CANCER.....</i>	<i>39</i>
TARGETED THERAPY .....	39
<i>TABLE 10 TARGETED THERAPY USED TO TREAT LIVER CANCER.....</i>	<i>39</i>
CONGENITAL LIVER DEFECTS .....	40
AUTOIMMUNE LIVER DISORDERS.....	40
<i>TABLE 11 DRUGS USED TO TREAT WILSON'S DISEASE.....</i>	<i>40</i>
CORTICOSTEROIDS .....	41
<i>TABLE 12 CORTICOSTEROIDS USED TO TREAT AUTOIMMUNE HEPATITIS.....</i>	<i>41</i>
IMMUNOSUPPRESSIVE AGENTS .....	41
<i>TABLE 13 IMMUNOSUPPRESSIVE AGENTS USED TO TREAT AUTOIMMUNE HEPATITIS.....</i>	<i>41</i>
ANTIMETABOLITES .....	42
<i>TABLE 14 ANTI-METABOLITES USED TO TREAT AUTOIMMUNE HEPATITIS.....</i>	<i>42</i>
ALCOHOL-INDUCED LIVER DISEASE.....	42
ANABOLIC STEROIDS.....	42
<i>TABLE 15 ANABOLIC STEROIDS USED TO TREAT ALCOHOLIC LIVER DAMAGE.....</i>	<i>42</i>
ALCOHOL-ABUSE DRUGS.....	43
<i>TABLE 16 ALCOHOL-ABUSE DRUGS USED TO TREAT ALCOHOLIC LIVER DAMAGE.....</i>	<i>43</i>
CHRONIC LIVER DISEASE .....	43
ANTI-REJECTION MEDICATIONS .....	43

<i>TABLE 17 ANTI-REJECTION MEDICATIONS</i> .....	43
<i>TABLE 17 (CONTINUED)</i> .....	44
ANTI-INFECTIVES .....	44
<i>TABLE 18 ANTI-INFECTIVES</i> .....	44
ANTIFUNGAL PROPHYLAXIS.....	44
<i>TABLE 19 ANTIFUNGAL PROPHYLAXIS FOR LIVER TRANSPLANT</i> <i>RECIPIENTS</i> .....	44
NON-ALCOHOLIC FATTY LIVER .....	45
GALLSTONE-SOLUBILIZING AGENTS .....	45
<i>TABLE 20 GALLSTONE-SOLUBILIZING AGENTS USED TO TREAT</i> <i>NON-ALCOHOLIC FATTY LIVER DISEASE</i> .....	45
OTHER DRUGS .....	46
<i>TABLE 21 OTHER DRUGS USED TO TREAT NON-ALCOHOLIC</i> <i>FATTY LIVER DISEASE</i> .....	46
 CHAPTER FIVE: REGULATORY ASPECTS .....	47
<i>TABLE 22 NEW DRUG APPROVALS, 2008–AUGUST 2011</i> .....	47
<i>TABLE 22 (CONTINUED)</i> .....	48
<i>TABLE 23 NEW APPROVALS FOR DRUGS USED TO TREAT LIVER</i> <i>DISEASE, 2008–2011</i> .....	48
<i>FIGURE 1 NEW APPROVALS FOR DRUGS USED TO TREAT LIVER</i> <i>DISEASE, 2008–AUGUST 2011</i> .....	48
<i>TABLE 24 NEW DRUG APPLICATIONS, 2008–AUGUST 2011</i> .....	49
<i>TABLE 25 RECALLS, 2008–AUGUST 2011</i> .....	49
 CHAPTER SIX: PREVALENCE .....	50
U.S. ....	50
<i>TABLE 26 U.S. PREVALENCE OF LIVER DISEASE</i> .....	51
EUROPE.....	51
REST OF THE WORLD.....	52
PREVALENCE OF CERTAIN TYPES OF LIVER DISEASE .....	53
HEPATITIS .....	53
U.S.....	54
<i>TABLE 27 U.S. ANNUAL HEPATITIS PREVALENCE</i> .....	54
<i>TABLE 28 U.S. HEPATITIS BURDEN, 2007 AND 2008 (NO. OF CASES)</i> .....	54
<i>TABLE 29 U.S. INCIDENCE OF ACUTE HEPATITIS BY SEX AND</i> <i>AGE, 2006</i> .....	55
CIRRHOSIS.....	55
LIVER CANCER OR HEPATOCELLULAR CARCINOMA.....	55
NON-ALCOHOLIC FATTY LIVER.....	56
 CHAPTER SEVEN: INDUSTRY STRUCTURE .....	57
MARKET SHARES OF INDUSTRY LEADERS FOR DRUGS USED TO TREAT LIVER DISEASE .....	57
VACCINES .....	57

<i>TABLE 30 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF VACCINES FOR HEPATITIS, 2010 (%)</i> .....	57
<i>FIGURE 2 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF VACCINES FOR HEPATITIS, 2010 (%)</i> .....	58
ANTIVIRALS.....	58
Nucleosides .....	58
<i>TABLE 31 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF NUCLEOSIDE ANALOGUES FOR HEPATITIS, 2010 (%)</i> .....	58
<i>FIGURE 3 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF NUCLEOSIDE ANALOGUES FOR HEPATITIS, 2010 (%)</i> .....	59
Nucleotides.....	59
<i>TABLE 32 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF NUCLEOTIDE ANALOGUES FOR HEPATITIS, 2010 (%)</i> .....	59
<i>FIGURE 4 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF NUCLEOTIDE ANALOGUES FOR HEPATITIS, 2010 (%)</i> .....	60
Interferons .....	60
<i>TABLE 33 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF INTERFERONS FOR HEPATITIS, 2010 (%)</i> .....	60
<i>FIGURE 5 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF INTERFERONS FOR HEPATITIS, 2010 (%)</i> .....	61
IMMUNE GLOBULINS.....	61
<i>TABLE 34 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF IMMUNOGLOBULINS FOR HEPATITIS, 2010 (%)</i> .....	61
<i>FIGURE 6 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF IMMUNE GLOBULINS FOR HEPATITIS, 2010 (%)</i> .....	62
CHEMOTHERAPY .....	62
<i>TABLE 35 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF CHEMOTHERAPEUTIC AGENTS FOR LIVER CANCER AND TUMORS, 2010 (%)</i> .....	62
<i>FIGURE 7 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF CHEMOTHERAPEUTIC AGENTS FOR LIVER CANCER AND TUMORS, 2010 (%)</i> .....	63
TARGETED THERAPY .....	63
<i>TABLE 36 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF TARGETED THERAPY AGENTS FOR LIVER CANCER AND TUMORS, 2010 (%)</i> .....	63
<i>FIGURE 8 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF TARGETED THERAPY AGENTS FOR LIVER CANCER AND TUMORS, 2010 (%)</i> .....	64

DRUGS USED TO TREAT WILSON'S DISEASE: MINERALS AND CHELATING AGENTS .....	64
<i>TABLE 37 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF MINERALS AND CHELATING AGENTS TO TREAT WILSON'S DISEASE, 2010 (%) .....</i>	<i>64</i>
<i>FIGURE 9 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF MINERALS AND CHELATING AGENTS TO TREAT WILSON'S DISEASE, 2010 (%) .....</i>	<i>65</i>
CORTICOSTEROIDS .....	65
<i>TABLE 38 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF CARTICOSTEROIDS FOR TREATING LIVER DISEASE, 2010 (%).....</i>	<i>66</i>
<i>FIGURE 10 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF CORTICOSTEROIDS FOR TREATING LIVER DISEASE, 2010 (%).....</i>	<i>66</i>
IMMUNOSUPPRESSIVE AGENTS .....	66
<i>TABLE 39 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF IMMUNOSUPPRESSIVE AGENTS FOR TREATING LIVER DISEASE, 2010 (%).....</i>	<i>67</i>
<i>FIGURE 11 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF IMMUNOSUPPRESSIVE AGENTS FOR TREATING LIVER DISEASE, 2010 (%).....</i>	<i>67</i>
ANTIMETABOLITES .....	68
<i>TABLE 40 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF ANTIMETABOLITES FOR TREATING LIVER DISEASE, 2010 (%).....</i>	<i>68</i>
<i>FIGURE 12 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF ANTIMETABOLITES FOR TREATING LIVER DISEASE, 2010 (%).....</i>	<i>68</i>
ANABOLIC STEROIDS.....	69
<i>TABLE 41 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF ANABOLIC STEROIDS FOR TREATING LIVER DISEASE, 2010 (%).....</i>	<i>69</i>
<i>FIGURE 13 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF ANABOLIC STEROIDS FOR TREATING LIVER DISEASE, 2010 (%).....</i>	<i>69</i>
ALCOHOL-ABUSE DRUGS.....	70
<i>TABLE 42 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF ALCOHOL-ABUSE DRUGS, 2010 (%).....</i>	<i>70</i>
<i>FIGURE 14 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF ALCOHOL-ABUSE DRUGS, 2010 (%).....</i>	<i>70</i>
ANTI-REJECTION DRUGS .....	71
<i>TABLE 43 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF ANTI-REJECTION DRUGS, 2010 (%).....</i>	<i>71</i>

<i>FIGURE 15 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF ANTI-REJECTION DRUGS, 2010 (%)</i> .....	71
INFECTION-FIGHTING DRUGS.....	72
<i>TABLE 44 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF INFECTION-FIGHTING DRUGS USED AFTER LIVER TRANSPLANT, 2010 (%)</i> .....	72
<i>FIGURE 16 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF INFECTION-FIGHTING DRUGS USED AFTER LIVER TRANSPLANT, 2010 (%)</i> .....	72
ANTIFUNGAL PROPHYLAXIS MARKET .....	73
<i>TABLE 45 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF ANTIFUNGAL PROPHYLAXIS FOR TREATING LIVER TRANSPLANTS, 2010 (%)</i> .....	73
<i>FIGURE 17 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF ANTIFUNGAL PROPHYLAXIS FOR TREATING LIVER TRANSPLANTS, 2010 (%)</i> .....	73
GALLSTONE-SOLUBILIZING AGENTS .....	74
<i>TABLE 46 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF GALLSTONE-SOLUBILIZING AGENTS, 2010 (%)</i> .....	74
<i>FIGURE 18 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF GALLSTONE-SOLUBILIZING AGENTS, 2010 (%)</i> .....	74
OTHER DRUGS FOR NON-ALCOHOLIC FATTY LIVER DISEASE.....	75
<i>TABLE 47 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF OTHER DRUGS FOR NON-ALCOHOLIC FATTY LIVER DISEASE, 2010 (%)</i> .....	75
<i>FIGURE 19 GLOBAL MARKET SHARES FOR MANUFACTURERS AND SUPPLIERS OF OTHER DRUGS FOR NON-ALCOHOLIC FATTY LIVER DISEASE, 2010 (%)</i> .....	75
CHAPTER EIGHT: NEW DEVELOPMENTS .....	76
CLINICAL TRIALS .....	76
<i>TABLE 48 CLINICAL TRIALS FOR HEPATITIS, 2009–SEPTEMBER 2011</i> .....	76
<i>TABLE 49 CLINICAL TRIALS FOR LIVER TUMORS, 2009–SEPTEMBER 2011</i> .....	77
<i>TABLE 50 CLINICAL TRIALS FOR AUTOIMMUNE LIVER DISORDERS, 2009–SEPTEMBER 2011</i> .....	77
<i>TABLE 51 CLINICAL TRIALS FOR ALCOHOL-INDUCED LIVER DISEASES, 2009–SEPTEMBER 2011</i> .....	78
<i>TABLE 52 CLINICAL TRIALS FOR CHRONIC LIVER DISEASES, 2009–SEPTEMBER 2011</i> .....	78
<i>TABLE 53 CLINICAL TRIALS FOR NON-ALCOHOLIC FATTY LIVER DISEASE, 2009–SEPTEMBER 2011</i> .....	78
CLINICAL TRIALS (CONTINUED) .....	79

LATEST RESEARCH ON LIVER DISEASE TREATMENT.....	80
LIVER CANCER .....	80
LIVER ENZYME TEST .....	81
IMMUNE SYSTEM.....	81
LIVER TRANSPLANTS .....	81
NANOPARTICLES .....	82
HEPATITIS .....	82
CHAPTER NINE: MARKET ANALYSIS BY DRUG TYPES.....	83
MARKET ANALYSIS BY DRUG TYPES .....	83
MARKET REVENUE .....	84
<i>TABLE 54 GLOBAL MARKET FOR DRUGS USED TO TREAT LIVER DISEASE, THROUGH 2016 (\$ MILLIONS)</i> .....	84
<i>FIGURE 20 GLOBAL MARKET FOR DRUGS USED TO TREAT LIVER DISEASE, 2009-2016 (\$ MILLIONS)</i> .....	85
MARKET SHARE .....	86
<i>TABLE 55 DRUGS USED TO TREAT LIVER DISEASES, 2010 (%)</i> .....	86
<i>FIGURE 21 DRUGS USED TO TREAT LIVER DISEASES, 2010 (%)</i> .....	87
VACCINES.....	87
MARKET REVENUE.....	88
<i>TABLE 56 GLOBAL MARKET FOR VACCINES TO TREAT HEPATITIS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	88
<i>FIGURE 22 GLOBAL MARKET FOR VACCINES TO TREAT HEPATITIS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	89
ANTIVIRALS .....	89
NUCLEOSIDES .....	90
Market Revenue .....	90
<i>TABLE 57 GLOBAL MARKET FOR NUCLEOSIDES TO TREAT HEPATITIS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	90
<i>FIGURE 23 GLOBAL MARKET FOR NUCLEOSIDES TO TREAT HEPATITIS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	90
NUCLEOTIDES .....	91
Market Revenue .....	91
<i>TABLE 58 GLOBAL MARKET FOR NUCLEOTIDES TO TREAT HEPATITIS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	91
<i>FIGURE 24 GLOBAL MARKET FOR NUCLEOTIDES TO TREAT HEPATITIS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	92
INTERFERONS .....	93
Market Revenue .....	94
<i>TABLE 59 GLOBAL MARKET FOR INTERFERONS TO TREAT HEPATITIS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	94
<i>FIGURE 25 GLOBAL MARKET FOR INTERFERONS TO TREAT HEPATITIS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	94
PROTEASE INHIBITORS.....	95



<i>TABLE 60 GLOBAL MARKET FOR PROTEASE INHIBITORS TO TREAT HEPATITIS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	96
<i>FIGURE 26 GLOBAL MARKET FOR PROTEASE INHIBITORS TO TREAT HEPATITIS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	96
IMMUNE GLOBULINS .....	97
MARKET REVENUE.....	98
<i>TABLE 61 GLOBAL MARKET FOR IMMUNE GLOBULINS TO TREAT HEPATITIS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	98
<i>FIGURE 27 GLOBAL MARKET FOR IMMUNE GLOBULINS TO TREAT HEPATITIS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	98
CHEMOTHERAPY .....	99
MARKET REVENUE.....	100
<i>TABLE 62 GLOBAL MARKET FOR CHEMOTHERAPY DRUGS USED TO TREAT LIVER CANCER AND TUMORS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	100
<i>FIGURE 28 GLOBAL MARKET FOR CHEMOTHERAPY DRUGS USED TO TREAT LIVER CANCER AND TUMORS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	100
TARGETED THERAPY.....	101
MARKET REVENUE.....	102
<i>TABLE 63 GLOBAL MARKET FOR TARGETED THERAPY TO TREAT LIVER CANCER AND TUMORS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	102
<i>FIGURE 29 GLOBAL MARKET FOR TARGETED THERAPY TO TREAT LIVER CANCER AND TUMORS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	102
DRUGS USED TO TREAT WILSON'S DISEASE: MINERALS AND CHELATING AGENTS.....	103
MARKET REVENUE.....	104
<i>TABLE 64 GLOBAL MARKET FOR MINERALS AND CHELATING AGENTS TO TREAT WILSON'S DISEASE BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	104
<i>FIGURE 30 GLOBAL MARKET FOR MINERALS AND CHELATING AGENTS TO TREAT WILSON'S DISEASE BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	104
CORTICOSTEROIDS .....	105
MARKET REVENUE.....	105
<i>TABLE 65 GLOBAL MARKET FOR CORTICOSTEROIDS TO TREAT LIVER DISEASE BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	105
<i>FIGURE 31 GLOBAL MARKET FOR CORTICOSTEROIDS TO TREAT LIVER DISEASE BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	106
IMMUNOSUPPRESSIVE AGENTS.....	107
MARKET REVENUE.....	107

<i>TABLE 66 GLOBAL MARKET FOR IMMUNOSUPPRESSIVE AGENTS TO TREAT LIVER DISEASE BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	107
<i>FIGURE 32 GLOBAL MARKET FOR IMMUNOSUPPRESSIVE AGENTS TO TREAT LIVER DISEASE BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	108
ANTIMETABOLITES.....	109
MARKET REVENUE.....	109
<i>TABLE 67 GLOBAL MARKET FOR ANTIMETABOLITES TO TREAT LIVER DISEASE BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	109
<i>FIGURE 33 GLOBAL MARKET FOR ANTIMETABOLITES TO TREAT LIVER DISEASE BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	110
ANABOLIC STEROIDS .....	110
MARKET REVENUE.....	111
<i>TABLE 68 GLOBAL MARKET FOR ANABOLIC STEROIDS TO TREAT LIVER DISEASE BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	111
<i>FIGURE 34 GLOBAL MARKET FOR ANABOLIC STEROIDS TO TREAT LIVER DISEASE BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	111
ALCOHOL-ABUSE DRUGS.....	112
MARKET REVENUE.....	112
<i>TABLE 69 GLOBAL MARKET FOR ALCOHOL-ABUSE DRUGS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	112
<i>FIGURE 35 GLOBAL MARKET FOR ALCOHOL-ABUSE DRUGS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	113
ANTI-REJECTION DRUGS.....	113
MARKET REVENUE.....	114
<i>TABLE 70 GLOBAL MARKET FOR ANTI-REJECTION DRUGS FOR LIVER TRANSPLANTS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	114
<i>FIGURE 36 GLOBAL MARKET FOR ANTI-REJECTION DRUGS FOR LIVER TRANSPLANTS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	114
INFECTION-FIGHTING DRUGS .....	115
MARKET REVENUE.....	115
<i>TABLE 71 GLOBAL MARKET FOR INFECTION-FIGHTING DRUGS FOR LIVER TRANSPLANTS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	115
<i>FIGURE 37 GLOBAL MARKET FOR INFECTION-FIGHTING DRUGS FOR LIVER TRANSPLANTS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	116
ANTIFUNGAL PROPHYLAXIS .....	116
MARKET REVENUE.....	117
<i>TABLE 72 GLOBAL MARKET FOR ANTIFUNGAL PROPHYLAXIS FOR LIVER DISEASES BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	117
<i>FIGURE 38 GLOBAL MARKET FOR ANTIFUNGAL PROPHYLAXIS FOR LIVER DISEASES BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	117
GALLSTONE-SOLUBILIZING AGENTS .....	118

MARKET REVENUE.....	118
<i>TABLE 73 GLOBAL MARKET FOR GALLSTONE-SOLUBILIZING AGENTS BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	118
<i>FIGURE 39 GLOBAL MARKET FOR GALLSTONE-SOLUBILIZING AGENTS BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	119
OTHER DRUGS USED TO TREAT NON-ALCOHOLIC FATTY LIVER DISEASE.....	119
MARKET REVENUE.....	120
<i>TABLE 74 GLOBAL MARKET FOR OTHER DRUGS TO TREAT NON-ALCOHOLIC FATTY LIVER DISEASE BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	120
<i>FIGURE 40 GLOBAL MARKET FOR OTHER DRUGS TO TREAT NON-ALCOHOLIC FATTY LIVER DISEASE BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	120
MARKET SHARES FOR DRUG CATEGORIES USED TO TREAT LIVER DISEASES BY REGION.....	121
<i>TABLE 75 GLOBAL MARKET SHARES FOR DRUGS USED TO TREAT LIVER DISEASES BY REGION, 2010 (%)</i> .....	122
<i>FIGURE 41 GLOBAL MARKET SHARES FOR DRUGS USED TO TREAT LIVER DISEASES BY REGION, 2010 (%)</i> .....	122
CHAPTER TEN: MARKET BY DISEASE TYPE.....	123
<i>TABLE 76 GLOBAL MARKET FOR DRUGS USED TO TREAT LIVER DISORDERS BY DISEASE TYPE, THROUGH 2016 (\$ MILLIONS)</i> .....	124
<i>FIGURE 42 GLOBAL MARKET FOR DRUG USED TO TREAT LIVER DISORDERS BY DISEASE TYPE, 2009-2016 (\$ MILLIONS)</i> .....	124
HEPATITIS.....	125
<i>TABLE 77 GLOBAL MARKET FOR DRUGS USED TO TREAT HEPATITIS, THROUGH 2016 (\$ MILLIONS)</i> .....	126
<i>FIGURE 43 GLOBAL MARKET FOR DRUGS USED TO TREAT HEPATITIS, 2009-2016 (\$ MILLIONS)</i> .....	126
GLOBAL SHARE .....	127
<i>TABLE 78 GLOBAL SHARE FOR DRUGS USED TO TREAT HEPATITIS BY REGION, 2010 (%)</i> .....	127
<i>FIGURE 44 GLOBAL SHARE FOR DRUGS USED TO TREAT HEPATITIS BY REGION, 2010 (%)</i> .....	127
LIVER TUMORS.....	128
<i>TABLE 79 GLOBAL MARKET FOR DRUGS USED TO TREAT LIVER TUMORS AND CANCER BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	129
<i>FIGURE 45 GLOBAL MARKET FOR DRUGS USED TO TREAT LIVER TUMORS AND CANCER BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	129
GLOBAL SHARE .....	130
<i>TABLE 80 GLOBAL SHARE FOR DRUGS USED TO TREAT LIVER TUMORS AND CANCER BY REGION, 2010 (%)</i> .....	130

<i>FIGURE 46 GLOBAL SHARE FOR DRUGS USED TO TREAT LIVER TUMORS AND CANCER BY REGION, 2010 (%)</i> .....	130
<i>AUTOIMMUNE DISEASES</i> .....	131
<i>TABLE 81 GLOBAL MARKET FOR DRUGS USED TO TREAT AUTOIMMUNE LIVER DISEASES BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	132
<i>FIGURE 47 GLOBAL MARKET FOR DRUGS USED TO TREAT AUTOIMMUNE LIVER DISEASES BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	132
<i>GLOBAL SHARE</i> .....	133
<i>TABLE 82 GLOBAL SHARE FOR DRUGS USED TO TREAT AUTOIMMUNE LIVER DISEASES BY REGION, 2010 (%)</i> .....	133
<i>FIGURE 48 GLOBAL SHARE FOR DRUGS USED TO TREAT AUTOIMMUNE LIVER DISEASES BY REGION, 2010 (%)</i> .....	133
<i>ALCOHOL-INDUCED LIVER DISEASE</i> .....	134
<i>TABLE 83 GLOBAL MARKET FOR DRUGS USED TO TREAT ALCOHOL-INDUCED LIVER DISEASES BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	135
<i>FIGURE 49 GLOBAL MARKET FOR DRUGS USED TO TREAT ALCOHOL-INDUCED LIVER DISEASES BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	135
<i>GLOBAL SHARE</i> .....	136
<i>TABLE 84 GLOBAL SHARE OF ALCOHOL-INDUCED LIVER DISEASES BY REGION, 2010 (%)</i> .....	136
<i>FIGURE 50 GLOBAL SHARE OF ALCOHOL-INDUCED LIVER DISEASES BY REGION, 2010 (%)</i> .....	136
<i>CHRONIC LIVER DISEASE</i> .....	137
<i>TABLE 85 GLOBAL MARKET FOR DRUGS USED TO TREAT CHRONIC LIVER DISEASES BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	138
<i>FIGURE 51 GLOBAL MARKET FOR DRUGS USED TO TREAT CHRONIC LIVER DISEASES BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	138
<i>GLOBAL SHARE</i> .....	139
<i>TABLE 86 GLOBAL SHARE FOR DRUGS USED TO TREAT CHRONIC LIVER DISEASES BY REGION, 2010 (%)</i> .....	139
<i>FIGURE 52 GLOBAL SHARE FOR DRUGS USED TO TREAT CHRONIC LIVER DISEASES BY REGION, 2010 (%)</i> .....	139
<i>NON-ALCOHOLIC FATTY LIVER DISEASE</i> .....	140
<i>TABLE 87 GLOBAL MARKET FOR DRUGS USED TO TREAT NON-ALCOHOLIC FATTY LIVER DISEASE BY REGION, THROUGH 2016 (\$ MILLIONS)</i> .....	141
<i>FIGURE 53 GLOBAL MARKET FOR DRUGS USED TO TREAT NON-ALCOHOLIC FATTY LIVER DISEASE BY REGION, 2009-2016 (\$ MILLIONS)</i> .....	141

GLOBAL SHARE .....	142
<i>TABLE 88 GLOBAL SHARE FOR DRUGS USED TO TREAT NON-ALCOHOLIC FATTY LIVER DISEASE BY REGION, 2010 (%)</i> .....	142
<i>FIGURE 54 GLOBAL SHARE FOR DRUGS USED TO TREAT NON-ALCOHOLIC FATTY LIVER DISEASE BY REGION, 2010 (%)</i> .....	142
MARKET SHARE BY DISEASE TYPE.....	143
<i>TABLE 89 DRUGS USED TO TREAT LIVER DISORDERS BY DISEASE TYPE, 2010 (%)</i> .....	143
<i>FIGURE 55 DRUGS USED TO TREAT LIVER DISORDERS BY DISEASE TYPE, 2010 (%)</i> .....	143
 CHAPTER ELEVEN: DRUG-INDUCED LIVER DISEASE .....	144
DRUG-INDUCED LIVER DISEASE .....	144
DRUG-INDUCED LIVER DISEASE .....	145
<i>TABLE 90 DRUGS THAT CAN CAUSE LIVER DISEASE</i> .....	146
<i>TABLE 90 (CONTINUED)</i> .....	147
<i>TABLE 90 (CONTINUED)</i> .....	148
<i>TABLE 90 (CONTINUED)</i> .....	149
DRUGS THAT CAN CAUSE LIVER DISEASE.....	149
ACETAMINOPHEN (TYLENOL) .....	149
STATINS .....	149
NICOTINIC ACID (NIACIN).....	150
AMIODARONE (CARDARONE) .....	150
NITROFURANTOIN.....	150
AUGMENTIN.....	150
 CHAPTER TWELVE: PATENT ANALYSIS .....	151
PATENTS BY YEAR.....	151
<i>TABLE 91 PATENTS, 2009– SEPTEMBER 2011 (NUMBER/%)</i> .....	152
<i>FIGURE 56 PATENTS, 2009–SEPTEMBER 2011 (NUMBER)</i> .....	152
<i>FIGURE 57 PATENTS, 2009–SEPTEMBER 2011 (%)</i> .....	152
PATENTS BY TYPE.....	153
<i>TABLE 92 PATENTS BY TYPE, 2009–SEPTEMBER 2011 (NUMBER)</i> .....	153
<i>FIGURE 58 PATENTS BY TYPE, 2009–SEPTEMBER 2011 (%)</i> .....	154
PATENTS BY COMPANY.....	154
<i>TABLE 93 U.S. PATENTS FOR DRUGS USED TO TREAT LIVER DISEASE BY COMPANY, 2009–SEPTEMBER 2011</i> .....	155
<i>FIGURE 59 U.S. PATENTS FOR DRUGS USED TO TREAT LIVER DISEASE BY COMPANY, 2009–SEPTEMBER 2011 (NUMBER OF PATENTS)</i> .....	156
PATENTS BY COUNTRY .....	157
<i>TABLE 94 U.S. PATENTS BY COUNTRY, 2009–SEPTEMBER 2011 (NUMBER OF PATENTS)</i> .....	157
<i>FIGURE 60 U.S. PATENTS BY COUNTRY, 2009–SEPTEMBER 2011 (NUMBER OF PATENTS)</i> .....	158

PATENTS BY ASSIGNEE .....	158
<i>TABLE 95 PATENTS FOR DRUGS USED IN THE TREATMENT OF LIVER DISEASES BY ASSIGNEE, 2009–2011 (NUMBER OF PATENTS)</i> .....	159
<i>FIGURE 61 PATENTS FOR DRUGS USED IN THE TREATMENT OF LIVER DISEASES BY ASSIGNEE, 2009–2011 (NUMBER OF PATENTS)</i> .....	159
CHAPTER THIRTEEN: CURRENT SITUATION AND FUTURE	
PROSPECTS.....	160
PREVALENCE AND LIFE EXPECTANCY.....	160
LACK OF EDUCATION AND LIMITED TREATMENT OPTIONS.....	161
RESEARCH AND DEVELOPMENT.....	162
LIVER ORGANIZATIONS .....	163
CHAPTER FOURTEEN: COMPANY PROFILES .....	
ABBOTT LABORATORIES.....	164
ACTAVIS INC.....	164
ALKERMES .....	165
ASTELLAS PHARMA INC.....	165
ATON PHARMA (VALEANT PHARMACEUTICALS INTERNATIONAL) .....	166
BARR.....	166
BAYER SCHERING AG .....	167
BIOTEST .....	167
BRISTOL-MYERS SQUIBB.....	168
CANGENE CORPORATION.....	168
ELI LILLY.....	169
FOREST LABORATORIES, INC.....	170
GILEAD SCIENCES, INC.....	170
GLAXOSMITHKLINE PLC .....	171
IDENIX PHARMACEUTICALS, INC.....	171
MALLINCKRODT .....	172
MEDA PHARMACEUTICALS.....	173
MERCK & CO. ....	173
MYLAN.....	174
NOVARTIS.....	174
PFIZER.....	175
PROMETHEUS LABS.....	176
ROCHE.....	176
ROXANE LABORATORIES .....	177
SALIX PHARMACEUTICALS .....	178
SANOFI-AVENTIS .....	178
SAVIENT PHARMACEUTICALS, INC.....	179
SCHERING PLOUGH CORPORATION .....	179

TAKEDA PHARMACEUTICAL.....	180
TALECRIS BIOTHERAPEUTICS .....	181
THREE RIVERS PHARMACEUTICALS .....	182
VALEANT PHARMACEUTICALS INTERNATIONAL .....	182
VERTEX PHARMACEUTICALS, INC. ....	183
WATSON PHARMACEUTICALS, INC. ....	184
ZYDUS PHARMACEUTICALS INC.....	184
ZYDUS PHARMACEUTICALS INC. (CONTINUED) .....	185
APPENDIX: : ABBREVIATIONS AND DEFINITIONS.....	186
ABBREVIATIONS AND DEFINITIONS.....	186
ABBREVIATIONS AND DEFINITIONS (CONTINUED) .....	187