

SPECIALTY PHARMACY PIPELINE REPORT

First Quarter 2010

To help keep you informed about medications in development, the *Walgreens Specialty Pharmacy Pipeline Report* provides a summary of specialty medications that may be approved by the FDA within the next few years. While not all-inclusive, this report focuses on medications in phase III studies that may impact treatment for certain specialty disease states or conditions. It also highlights select, newly approved or soon-to-be approved specialty medications of interest to the marketplace.

Medications to Watch

Here is a closer look at a few recently approved or soon-to-be approved medications that may have a significant impact on therapeutic classes and treatment for specific disease states and conditions.

Egrifta (tesamorelin)

Theratechnologies has filed a new drug application (NDA) for Egrifta for the treatment of human immunodeficiency virus (HIV)-associated lipodystrophy, a condition associated with the use of highly active antiretroviral therapy and HIV infection itself. HIV-associated lipodystrophy is characterized by changes in body composition, including subcutaneous (SC) fat wasting and central fat accumulation, as well as dyslipidemia and insulin resistance.

Egrifta is a growth hormone-releasing factor analogue administered daily as a 2 mg SC injection. In two phase III clinical trials, Egrifta was shown to significantly decrease excess abdominal fat in HIV patients with lipodystrophy, compared with placebo (-13.1 percent versus 2.3 percent, respectively) while no significant changes in SC fat were observed. Egrifta was also associated with a significant decrease in triglycerides, but no difference was seen between Egrifta and placebo in fasting glucose and insulin or the two-hour oral glucose tolerance test. Theratechnologies expects a response to its NDA for Egrifta in March 2010.

Ridaforolimus

Ariad Pharmaceuticals has developed ridaforolimus for the treatment of patients with metastatic soft tissue and bone sarcomas. A sarcoma is a tumor of the connective tissue such as fat, muscle, blood vessels, nerves, deep skin tissues and cartilage. Sarcomas can be grouped into two general categories—soft tissue sarcoma and bone sarcoma—each with different treatment recommendations. Sarcomas are rare, accounting for less than one percent of all cancer diagnoses. According to the American Cancer Society, more than 10,000 new cases of soft tissue sarcoma and approximately 2,600 new cases of bone sarcoma were expected to be diagnosed in 2009. The overall survival rate for sarcomas averages between 60 percent and 70 percent, depending on the sarcoma type and stage of disease.

Ridaforolimus inhibits the mammalian target of rapamycin (mTOR) kinase, a protein that regulates tumor cell replication, growth and survival. In December 2009, Ariad announced the completion of patient enrollment in its randomized, double-blind, placebo-controlled, phase III clinical trial of ridaforolimus in patients with metastatic sarcoma who have benefited from prior chemotherapy. In this study, ridaforolimus is administered at a dose of 40 mg by mouth for five consecutive days each week, followed

by a two-day holiday. The primary endpoint of the trial is progression-free survival. Results from this trial are expected in the second half of 2010 and will serve as the basis for an NDA.

Dimebon (latrepirdine) and Huntexil® (pridopidine)

Dimebon and Huntexil® are investigational agents for the treatment of Huntington’s disease (HD), a genetic condition that causes a progressive neurodegenerative disorder. HD is a fatal disease with a typical course of 15 to 25 years from diagnosis to death and is thought to affect about 30,000 people living in North America.

Patients with HD experience movement disorders including chorea (involuntary tics and movements), dystonia (involuntary muscle contractions) and rigidity (increase in muscle tone), as well as behavior changes such as irritability, disinterest, depression and impulsiveness. Medications that may help manage these symptoms include Xenazine® (tetrabenazine), neuroleptics, mood stabilizers, antidepressants and antipsychotics. There are no treatments available to cure or slow down the progression of HD.

Dimebon was developed by Medivation in collaboration with Pfizer, and is thought to stabilize

and improve mitochondrial function. In a phase II trial, Dimebon was shown to significantly improve cognitive function over placebo in patients with mild to moderate HD. The most common adverse event in the Dimebon group was headache. Based on the positive phase II results, a randomized, double-blind, placebo-controlled, phase III trial was initiated in July 2009. During this six-month study, patients will receive Dimebon, 20 mg by mouth three times daily, or placebo. The primary endpoints of the trial are cognitive function, as measured by the Mini Mental State Examination, and a global function assessment.

NeuroSearch is studying the use of its dopaminergic stabilizer, Huntexil, in HD. In a recent phase III study, Huntexil administered at a dose of 45 mg by mouth twice daily demonstrated a statistically significant improvement in voluntary motor function compared with placebo. Huntexil is currently under evaluation in a second randomized, double-blind, placebo-controlled, phase III clinical trial. In this trial, three different doses of Huntexil are being compared to placebo to assess the effects of Huntexil on voluntary motor function. Results from the second trial are expected in the second half of 2010.

Medications Recently Approved

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Approval Date	Comments
Bleeding Disorders					
Octapharma USA/ Wilate® (von Willebrand factor/ Coagulation factor VIII complex [Human])	For the treatment of spontaneous and trauma-induced bleeding episodes in patients with severe von Willebrand disease (VWD), as well as patients with mild or moderate VWD in whom the use of desmopressin is known or suspected to be ineffective or contraindicated	Replaces deficient factor/Factor replacement therapy	Intravenous (IV) infusion	12/04/2009	First replacement therapy developed specifically for VWD.
Dupuytren’s Contracture					
Auxilium Pharmaceuticals/ Xiaflex™ (collagenase clostridium histolyticum)	For the treatment of adult patients with Dupuytren’s contracture with a palpable cord	Breaks down collagen deposits/ Purified collagenase clostridium histolyticum	Intralesional injection	02/02/2010	First FDA-approved nonsurgical treatment for Dupuytren’s contracture.

Medications Recently Approved (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Approval Date	Comments
Hereditary Angioedema (HAE)					
Dyax/ Kalbitor® (ecallantide)	For the treatment of acute attacks of HAE in patients 6 years of age and older	Inhibits the release of bradykinin, thereby preventing swelling and pain associated with HAE attacks/ Recombinant plasma kallikrein inhibitor	SC injection	11/27/2009	First subcutaneous HAE treatment approved in the United States.
Human Immunodeficiency Virus (HIV)					
Pfizer/ Selzentry® (maraviroc)	For the treatment of therapy-naïve adults infected with cellular chemokine receptor type 5 (CCR5)-tropic HIV-1 virus in combination with other antiretroviral agents	Inhibits entry of virus into human CD4 T-cells/CCR5 antagonist	Oral	11/20/2009	Previously approved for use in treatment-experienced patients with CCR5-tropic HIV-1 infection.
Inflammatory Diseases					
Roche/ Actemra® (tocilizumab)	For the treatment of adult patients with moderately to severely active rheumatoid arthritis (RA) who have had an inadequate response to one or more tumor necrosis factor (TNF) antagonist therapies	Blocks interleukin-6 (IL-6) receptors/ Monoclonal antibody	IV infusion	01/08/2010	Administered once every four weeks.
Multiple Sclerosis (MS)					
Acorda Therapeutics/ Ampyra™ (dalfampridine)	To improve walking in patients with MS	Improves impulse conduction in nerve fibers with damaged myelin/Selective neuronal potassium channel blocker	Oral	01/22/2010	First medication approved to improve walking in MS.
Oncology					
GlaxoSmithKline/ Tykerb® (lapatinib)	In combination with letrozole for the treatment of postmenopausal women with hormone receptor positive metastatic breast cancer that overexpresses the HER2 receptor for whom hormonal therapy is indicated	Reduces tumor cell growth and blood supply/Tyrosine kinase inhibitor	Oral	01/29/2010	Previously approved in combination with Xeloda® (capecitabine) for the treatment of patients with advanced or metastatic breast cancer whose tumors overexpress HER2 and who have received prior therapy, including an anthracycline, a taxane and Herceptin® (trastuzumab)

Pipeline Medications in Phase III Trials

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
Alpha-1 Antitrypsin (AAT) Deficiency				
Kamada/AAT	For the treatment of AAT deficiency	Replacement therapy/ Human plasma derived AAT	IV infusion	Biologic license application (BLA) filed June 2009. A response to the BLA is expected April 2010.
Amyloidosis				
FoldRx Pharmaceuticals/ Tafamidis	For the treatment of transthyretin (TTR) amyloid polyneuropathy	Inhibits TTR amyloid fibril formation/TTR stabilizer	Oral	Designated as an orphan drug with fast track status. NDA filing expected in 2010.
Anemia				
Affymax and Takeda/ Hematide™	For the treatment of anemia in patients with chronic renal failure	Binds to and activates the erythropoietin receptor/Erythropoiesis stimulating agent	Injection	Administered once every four weeks in clinical trials. Phase III results expected the second quarter 2010. NDA filing planned for 2010.
Cystic Fibrosis (CF)				
Inspire Pharmaceuticals/ Denufosol	For the treatment of CF	Designed to enhance mucosal hydration and mucociliary clearance/ Second generation P2Y ₂ agonist	Inhalation	Designated as an orphan drug with fast track status. Primary endpoint achieved in first phase III trial June 2008. Enrollment completed in second phase III study November 2009.
Hepatitis				
Human Genome Sciences and Novartis/ Zalbin™ (albinterferon alfa-2b), formerly Albuferon®	In combination with ribavirin for the treatment of hepatitis C virus (HCV) infection	Inhibits viral replication/Interferon	SC injection	BLA filed November 2009. A response to the BLA is expected September 2010.
Merck/ Boceprevir	In combination with PegIntron® (peginterferon alfa-2b) and Rebetol® (ribavirin) for the treatment of chronic HCV infection in treatment-naïve and treatment-failure patients	Prevents virus replication/Protease inhibitor	Oral	Phase III studies expected to be completed mid-2010.
Vertex Pharmaceuticals/ Telaprevir	In combination with peginterferon and ribavirin for the treatment of chronic HCV infection in treatment-naïve and treatment-failure patients	Prevents virus replication/Protease inhibitor	Oral	Phase III data expected in 2010. NDA filing anticipated in the second half of 2010.

Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
Hereditary Angioedema (HAE)				
Pharming Group NV/ Rhucin® (C1 inhibitor)	For the treatment of acute attacks in patients with HAE	Replaces deficient C1 inhibitor/C1 inhibitor replacement therapy	IV infusion	Designated as an orphan drug. Pharming met with the FDA to discuss BLA filing December 2009. The company will provide updates to progress on the BLA filing during the first half of 2010.
Human Immunodeficiency Virus (HIV)				
Merck/ Vicriviroc	For the treatment of R5-type HIV infection in combination with other antiretroviral agents (which must include a protease inhibitor) in treatment-experienced patients	Inhibits entry of virus into human CD4 T-cells/CCR5	Oral	Primary endpoint in two phase III trials not achieved January 2010. Merck will not seek approval for vicriviroc in treatment-experienced patients at this time, but will continue to study it in treatment-naïve patients.
Theratechnologies/ Egrifta (tesamorelin)	For the treatment of HIV-associated lipodystrophy	Reduces visceral adipose tissue/Growth hormone-releasing factor analogue	SC injection	NDA filed May 2009. A response to the NDA is expected March 2010.
Huntington's Disease (HD)				
Medivation and Pfizer/ Dimebon (latrepirdine)	For the treatment of HD	Stabilizes and improves mitochondrial function/Neuroprotector	Oral	Designated as an orphan drug. Phase III trial initiated July 2009.
NeuroSearch/ Huntexil® (pridopidine)	For the treatment of HD	Enhances or inhibits dopamine-dependent functions in the brain/ Dopaminergic stabilizer	Oral	Designated as an orphan drug. Primary endpoint achieved in phase III study February 2010.
Infertility				
Merck/ Corifollitropin alfa	For the development of multiple follicles and pregnancy in women participating in an assisted reproductive technology program	Stimulates ovarian follicular growth/ Sustained follicle stimulant	SC injection	Primary endpoints achieved in phase III trial July 2009.
Inflammatory Diseases				
Abbott/ ABT-874	For the treatment of psoriasis	Targets interleukin-12 (IL-12) and interleukin-23 (IL-23), which are involved in the inflammatory process/ Dual IL inhibitor	SC injection	BLA filing planned for 2010.
Genentech, Roche and Biogen/ Ocrelizumab	For the treatment of RA and lupus nephritis	Binds to B-cells and leads to cell death/Second generation anti-CD20	IV injection	Primary endpoint achieved in phase III RA trial December 2009. BLA filing planned for 2010.

Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
Inflammatory Diseases				
Human Genome Sciences and GlaxoSmithKline/ Benlysta™ (belimumab)	For the treatment of systemic lupus erythematosus	Inhibits the activity of B-lymphocyte stimulator (BLyS)/BLyS-specific inhibitor	IV infusion	BLA filing planned for the second quarter of 2010.
Savient Pharmaceuticals/ Krystexxa™ (pegloticase)	For the treatment of gout in patients for whom conventional treatment is contraindicated or ineffective	Lowers the plasma level of uric acid/ Bio-uricolytic agent	IV infusion	Designated as an orphan drug. BLA filed October 2008. Complete response letter August 2009. The FDA has requested additional information, including a proposal for a risk evaluation and mitigation strategy. Savient plans to resubmit its BLA in the first quarter of 2010.
Lysosomal Storage Diseases				
Protalix/ Uplyso (taliglucerase alfa), formerly prGCD	For the treatment of Gaucher disease	Replaces deficient glucocerebrosidase/ Enzyme replacement therapy	IV infusion	Designated as an orphan drug. NDA filed December 2009. FDA requested more information regarding NDA February 2010.
Shire/ Replagal® (agalsidase alfa)	For the treatment of Fabry disease	Replaces deficient alpha-galactosidase A/ Enzyme replacement therapy	IV infusion	Designated as an orphan drug. BLA filed December 2009. Available through an expanded access program.
Shire/ Velaglucerase alfa	For the treatment of type 1 Gaucher disease	Replaces deficient glucocerebrosidase/ Enzyme replacement therapy	IV infusion	Designated as an orphan drug with fast track status. Rolling NDA completed September 2009. FDA granted priority review status November 2009. A response to the NDA is expected February 2010. Available through an expanded access program.
Multiple Sclerosis (MS)				
Novartis/ Fingolimod (FTY720)	For the treatment of relapsing-remitting MS	Reduces inflammation and myelin damage in the brain and spinal cord/Sphingosine 1-phosphate receptor modulator	Oral	NDA filed December 2009. A response to the NDA is expected October 2010.
Sanofi-aventis/ Teriflunomide	For the treatment of relapsing forms of MS	Inhibits pyrimidine synthesis/ Immunomodulatory agent	Oral	Also being studied in combination with interferon-beta and with Copaxone® (glatiramer acetate).
Teva/ Laquinimod	For the treatment of relapsing-remitting MS	Inhibits autoimmune and inflammatory disease activity/ Immunomodulatory agent	Oral	FDA granted fast track status. Two phase III studies have completed enrollment and are currently ongoing.
Neuroendocrine Disorders				
Novartis/ Pasireotide	For the treatment of Cushing's disease and acromegaly	Binds somatostatin receptors/Somatostatin analogue	SC injection	Designated as an orphan drug. NDA filing for Cushing's disease planned for 2010.

Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
Oncology				
AstraZeneca/ Recentin (cidiranib)	For the treatment of colorectal cancer and recurrent glioblastoma	Reduces tumor cell growth and blood supply/Tyrosine kinase inhibitor	Oral	NDA filing planned for the second half of 2010.
Cell Therapeutics/ Opaxio™ (paclitaxel poliglumex), formerly Xyotax™	For the treatment of ovarian cancer	Promotes assembly and stabilizes microtubules resulting in inhibition of cellular division/ Antimicrotubule chemotherapy agent	IV infusion	Links paclitaxel to a biodegradable polyglutamate polymer that delivers more chemotherapy to tumor cells.
Cell Therapeutics/ Pixantrone	For the treatment of relapsed or refractory aggressive non-Hodgkin's lymphoma (NHL)	Damages the DNA of cancer cells resulting in cancer cell death/ Topoisomerase II inhibitor	IV infusion	Designed to reduce the potential for heart damage, compared with current anthracyclines. Rolling NDA submission completed June 2009. A response to the NDA is expected April 2010.
Centocor Ortho Biotech/ Trabectedin	In combination with Doxil® (doxorubicin) for the treatment of relapsed ovarian cancer	Interferes with cell division, genetic transcription processes and DNA repair machinery/Nonplatinum antitumor agent	IV infusion	Designated as an orphan drug. NDA filed November 2008. Complete response letter September 2009. The FDA has requested additional information.
ChemGenex Pharmaceuticals/ Omapro™ (omacetaxine)	For the treatment of chronic myeloid leukemia in patients who failed Gleevec® (imatinib) and have the T315I Bcr-Abl point mutation	Inhibits protein translation of oncoproteins/Cetaxine	SC injection	Designated as an orphan drug with fast track status. Rolling NDA completed September 2009. FDA granted priority review status November 2009. A response to the NDA is expected March 2010.
Dendreon/ Provenge® (sipuleucel-T)	For the treatment of metastatic hormone-refractory prostate cancer (HRPC)	Stimulates immune system to target and destroy cancer cells/Active cellular immunotherapy	IV infusion	BLA filed November 2006. Complete response letter May 2007. Amended BLA filed November 2009. A response to the BLA is expected May 2010.
EpiCept/ Ceplene® (histamine dihydrochloride)	In conjunction with IL-2 as a remission maintenance treatment for acute myeloid leukemia (AML)	Protects the lymphocytes responsible for destroying leukemia cells/Histamine analogue	SC injection	Designated as an orphan drug. NDA filing was planned for the end of 2009, now planned for 2010.
Genta/ Genasense® (oblimersen)	For the treatment of melanoma and relapsed or refractory chronic lymphocytic leukemia (CLL) in combination with chemotherapy and melanoma	Inhibits the production of Bcl-2/Antisense therapy	IV infusion	Designated as an orphan drug. NDA for CLL filed December 2005. Non-approvable letter December 2006. NDA amended June 2008. Complete response letter December 2008. According to preliminary results, one co-primary endpoint not achieved in phase III melanoma trial October 2009. The second co-primary endpoint is too early to evaluate.

Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
Oncology				
Marshall Edwards/ Phenoxodiol	For the treatment of recurrent chemotherapy-resistant, late-stage ovarian cancer	Causes cell death through inhibition of antiapoptotic proteins/ Antineoplastic (multiple signal transduction regulator)	Oral	FDA granted fast track status. Analysis of phase III data expected to be completed in the second quarter of 2010.
Merck and Ariad Pharmaceuticals/ Ridaforolimus (MK-8669), formerly deforolimus	For the treatment of metastatic soft tissue and bone sarcomas	Inhibits tumor cell growth and the formation of new blood vessels/mTOR inhibitor	Oral	Designated as an orphan drug with fast track status. Phase III trial conducted under a special protocol assessment (SPA). NDA filing planned for 2010.
Novelos Therapeutics/ NOV-002	For the treatment of advanced non-small cell lung cancer (NSCLC) in combination with first-line chemotherapy	Regulates the production of interleukins/ Immunomodulatory agent	IV infusion	NDA filing planned for the third quarter of 2010.
Poniard Pharmaceuticals/ Picoplatin	For the second-line treatment of small cell lung cancer (SCLC)	Interferes with cell division and genetic transcription processes, leading to cell death/Platinum agent	IV infusion	Designed to overcome platinum resistance. Designated as an orphan drug with fast track status. Primary endpoint not achieved in phase III trial November 2009. Poniard plans to meet with the FDA to discuss a regulatory path for approval.
Sanofi-aventis/ Larotaxel	For second-line treatment of pancreatic cancer	Inhibits the growth and development of cancer cells/Taxane derivative	IV infusion	NDA filing planned for June 2010.
Vion Pharmaceuticals/ Onrigin™ (laromustine)	For remission induction in patients 60 years or older with <i>de novo</i> poor-risk AML	Causes cell death and disrupts cell division/ Alkylating agent	IV infusion	NDA filed February 2009. Complete response letter December 2009. The FDA has requested that Vion complete another clinical trial of Onrigin. The company has also voluntarily filed for bankruptcy.
Osteoporosis				
Amgen/ Prolia™ (denosumab)	For the treatment of postmenopausal osteoporosis (PMO) and cancer-related bone loss	Inhibits bone destruction/ Monoclonal antibody	SC injection	BLA filed for PMO and cancer-related bone loss December 2008. Complete response letter October 2009. Amgen submitted the information requested by the FDA for the PMO indication January 2010.
Primary Immunodeficiencies				
CSL Behring/ Hizentra™ (immune globulin with proline)	For the treatment of primary immunodeficiencies	Replaces deficient immune globulin/ Replacement therapy	SC infusion	BLA filed May 2009. A response to the BLA is expected March 2010.

Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
Pulmonary Arterial Hypertension (PAH)				
Pfizer/ Theelin™ (sitaxsentan)	For the treatment of PAH	Reduces vascular smooth muscle constriction/ Endothelin receptor antagonist	Oral	Designated as an orphan drug. NDA filed May 2005. First approvable letter March 2006. Second approvable letter July 2006. Third approvable letter June 2007. Phase III studies ongoing.
Pulmonary Fibrosis				
InterMune/ Pirfenidone	For the treatment of idiopathic pulmonary fibrosis (IPF)	Suppresses the production of inflammatory cytokines/Antifibrotic agent	Oral	Currently, there are no FDA approved treatments for IPF. Designated as an orphan drug with fast track status. NDA filed November 2009. FDA granted priority review status January 2010. A response to the NDA is expected May 2010.
Respiratory Syncytial Virus (RSV)				
MedImmune and AstraZeneca/ Numax® (motavizumab)	For the prevention of RSV infection in high-risk pediatric populations	Inhibits RSV replication/ Monoclonal antibody	Intramuscular (IM) injection	BLA filed January 2008. Complete response letter November 2008. MedImmune submitted the information requested by the FDA December 2009.
Transplantation				
Bristol-Myers Squibb/ Belatacept	For the prevention of graft rejection and maintenance of kidney function following renal transplantation	Inhibits T-cell activation/Selective costimulation modulator	IV infusion	BLA filed July 2009. A response to the BLA is expected May 2010.
Osiris Therapeutics/ Prochymal	For the treatment of acute graft versus host disease	Repairs damaged tissue/Stem cell product	IV infusion	Designated as an orphan drug with fast track status. Rolling BLA initiated April 2009. According to preliminary results, primary endpoint not achieved in two phase III trials September 2009.

New Dosage Forms in the Pipeline

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Current Route of Administration	Investigational Route of Administration*	Comments
Cystic Fibrosis (CF)					
Gilead Sciences/ Cayston™ (aztreonam lysine)	For the treatment of patients with CF who have pulmonary <i>Pseudomonas aeruginosa</i>	Inhibits bacterial cell wall synthesis/ Monobactam antibiotic	IV injection	Inhalation	Designated as an orphan drug. NDA filed November 2007. Complete response letter September 2008. A response to the NDA is expected February 2010. Available through an expanded access program.

New Dosage Forms in the Pipeline (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Current Route of Administration	Investigational Route of Administration*	Comments
Cystic Fibrosis (CF)					
Novartis/ TBM100 (tobramycin)	For the treatment of patients with CF who have pulmonary <i>Pseudomonas aeruginosa</i>	Disrupts protein synthesis/ Aminoglycoside antibiotic	Solution for inhalation	Powder for inhalation	Expected to provide more rapid and convenient administration of tobramycin. NDA filing was planned for 2009.
Lysosomal Storage Diseases					
Genzyme/ Lumizyme™ (alglucosidase alfa)	For the treatment of Pompe disease	Replaces deficient acid alpha-glucosidase/ Enzyme replacement therapy	IV infusion	IV infusion	Same active ingredient as Myozyme® but produced at a larger scale to fulfill global demand. BLA filed May 2008. First complete response letter March 2009. Second complete response letter November 2009. A response to the BLA is now expected June 2010.
Multiple Sclerosis (MS)					
EMD Serono/ Oral cladribine	For the treatment of relapsing forms of MS	Interferes with lymphocytes, which are involved in the pathology of MS/ Antineoplastic (purine nucleoside analogue)	IV infusion	Oral	Designated as an orphan drug with fast track status. NDA filed September 2009. Received a refuse to file letter from the FDA November 2009. The company will work with the FDA to define a regulatory path for resubmission of the NDA.
Oncology					
Watson Pharmaceuticals/ Trelstar® (triptorelin pamoate)	For the palliative treatment of advanced prostate cancer	Suppresses the production of testosterone/ Luteinizing hormone-releasing hormone agonist	IM injection	IM injection	A sustained-release formulation designed to be administered every six months. NDA filed September 2008. Complete response letter July 2009. The FDA has requested additional information.

*Dosage form is not available. Only investigational route of administration is available at this time.

New Indications in the Pipeline

Manufacturer/ Drug Name	Current Indication	Investigational Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
Asthma					
Genentech/ Xolair® (omalizumab)	For the treatment of adults and adolescents (12 years of age and above) with moderate to severe persistent allergic asthma	For the treatment of children (6 years of age and above) with moderate to severe persistent allergic asthma	Decreases the release of allergic mediators/ Anti-immunoglobulin E agent	SC injection	Supplemental biologics license application (sBLA) filed December 2008. FDA Advisory Committee recommended against approval November 2009.
Hereditary Angioedema (HAE)					
ViroPharma / Cinryze™ (C1 inhibitor)	For routine prophylaxis against angioedema attacks in patients with HAE	For the treatment of acute angioedema attacks in patients with HAE	Replaces deficient C1 inhibitor/C1 inhibitor replacement therapy	IV infusion	sBLA filed December 2008. Complete response letter June 2009. The FDA requested an additional clinical study.
Infantile Spasms					
Questcor Pharmaceuticals/ H.P. Acthar® Gel (repository corticotrophin injection)	Multiple indications, including the diagnostic testing of adrenocortical function and the treatment of MS exacerbations	For the treatment of infantile spasms	Stimulates the adrenal cortex to secrete cortisol/ Highly purified preparation of adrenocorticotrophic hormone	IM or SC injection	Supplemental new drug application (sNDA) filed June 2006. Non-approvable letter May 2007. sNDA resubmitted October 2009. A response to the sNDA is expected June 2010.
Lysosomal Storage Diseases					
Actelion/ Zavesca® (miglustat)	For the treatment of adult patients with mild to moderate type 1 Gaucher disease for whom enzyme replacement therapy is not a therapeutic option	For the treatment of progressive neurological manifestations of Niemann-Pick type C disease	Inhibits glucosylceramide synthase/Substrate reduction therapy	Oral	Designated as an orphan drug. sNDA filed September 2009. A response to the sNDA is expected March 2010.
Multiple Sclerosis (MS)					
Genzyme/ Campath® (alemtuzumab)	For the treatment of B-cell CLL	For the treatment of relapsing-remitting MS	Binds to the CD52 antigen on B-cells and T-cells/ Therapeutic antibody	IV infusion	Completed enrollment in two phase III trials comparing Campath to Rebif® (interferon beta-1a) in 2009. sBLA filing expected in 2011.
Oncology					
Genentech and Biogen Idec/ Rituxan® (rituximab)	For the treatment of NHL For the treatment of moderately to severely active RA in patients who have had an inadequate response to one or more TNF inhibitors	In combination with standard chemotherapy for the treatment of CLL	Reduces the amount of CD20-positive B-cells in the blood/Therapeutic antibody	IV infusion	sBLA filed May 2009. Complete response letter November 2009.

New Indications in the Pipeline (continued)

Manufacturer/ Drug Name	Current Indication	Investigational Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
Oncology					
Genzyme/ Clolar [®] (clofarabine)	For the treatment of pediatric patients (1 to 21 years old) with relapsed or refractory AML after at least two prior regimens	For the treatment of adult patients with AML	Inhibits DNA synthesis/Purine nucleoside metabolic inhibitor	IV infusion	Designated as an orphan drug. sNDA filed November 2008. Complete response letter October 2009. The FDA recommends an additional clinical trial.
Novartis/ Tasigna [®] (nilotinib)	For the treatment of chronic and accelerated phase Philadelphia chromosome positive chronic myelogenous leukemia (CML) in adult patients resistant or intolerant to prior therapy that included Gleevec (imatinib)	For the first-line treatment of CML For the treatment of gastrointestinal stromal tumor (GIST) in patients who have failed both Gleevec (imatinib) and Sutent [®] (sunitinib) therapies	Inhibits Bcr-Abl kinase/Tyrosine kinase inhibitor	Oral	sNDA for first-line CML treatment filed December 2009. A response to the sNDA is expected October 2010.
OSI Pharmaceuticals and Genentech/ Tarceva [®] (erlotinib)	For the treatment of advanced NSCLC after failure of at least one prior chemotherapy regimen For the first-line treatment of advanced pancreatic cancer in combination with Gemzar [®] (gemcitabine)	First-line maintenance therapy in patients with advanced NSCLC who have not progressed following first-line treatment with platinum-based chemotherapy	Reduces tumor cell growth and blood supply/Epidermal growth factor receptor inhibitor	Oral	sNDA filed March 2009. A response to the sNDA was expected January 2010; however, the review period was extended by 90 days after OSI submitted additional information. A response is now expected April 2010.
Pfizer/ Sutent [®] (sunitinib)	For the treatment of GIST and advanced renal cell carcinoma (RCC)	For the treatment of breast cancer, NSCLC, hepatocellular cancer, HRPC and pancreatic cancer	Reduces tumor cell growth and blood supply/Multikinase inhibitor	Oral	sNDA for pancreatic cancer treatment filed January 2010.
Merck/ PegIntron [®] (peginterferon alfa-2b)	For the treatment of chronic HCV infection	For the adjuvant treatment of stage III melanoma	Unknown mechanism of action in cancer treatment/ Interferon	SC injection	sBLA filed September 2007. Complete response letter October 2009.
Pulmonary Fibrosis					
Actelion/ Tracleer [®] (bosentan)	For the treatment of PAH (WHO Group I) in patients with WHO Class II to IV symptoms	For the treatment of IPF	Reduces vascular smooth muscle constriction/ Endothelin receptor antagonist	Oral	Phase III results expected in early 2010.

New Indications in the Pipeline (continued)

Manufacturer/ Drug Name	Current Indication	Investigational Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
Transplantation					
Novartis/ Certican™ (everolimus)	For the treatment of advanced RCC in patients who have failed treatment with Sutent or Nexavar®	For the prevention of kidney transplant rejection in combination with Neoral® (cyclosporine)	Inhibits proliferation of T-cells/ mTOR inhibitor	Oral	NDA filed December 2002. First approvable letter October 2003. Second approvable letter August 2004. FDA Advisory Committee recommended approval December 2009. Marketed under the brand name Afinitor® for RCC indication.

Glossary of Terms

Accelerated approval – allows pharmaceutical companies to obtain approval for products based on less clinical data than typically required for a normal approval, and is used for patients considered to have unmet medical needs.

Approvable letter – term used when assessing NDAs which indicated that a medication could probably be approved at a later date, provided that the applicant supplied requested information to the FDA or made specified changes. Since August 11, 2008, the FDA has issued a complete response letter to the applicant in place of an approvable letter.

BLA – stands for “biologic license application,” similar to an NDA, but used for investigational medications that are considered to be biologic agents.

Complete response letter – issued to let the applicant know that the review period for an investigational agent is complete and that the NDA or BLA is not yet ready for approval.

Cystic fibrosis – CF.

Double-blind trial – a type of study in which the participants and the investigators are blinded to treatment; this type of study has less bias than nonblinded studies.

Expanded access program – manufacturer programs that allow the distribution of new medications prior to FDA approval for patients with a life-threatening condition who cannot be treated successfully with currently available medications.

Fast track status – designation granted by the FDA to an investigational agent indicating an expedited review of the NDA or BLA; usually applies to medications that treat serious or life-threatening conditions and that demonstrate the potential to address unmet medical needs.

Hereditary angioedema – HAE.

Multiple sclerosis – MS.

NDA – stands for “new drug application,” the process by which a manufacturer submits information to the FDA to gain approval for the agent; conducted after phase III development is completed.

Non-approvable letter – term used when assessing NDAs which indicated that the application had deficiencies that generally required the submission of substantial data before the application could be approved. Since August 11, 2008, the FDA has issued a complete response letter to the applicant in place of a non-approvable letter.

Orphan drug – a medication that treats a rare disease that affects fewer than 200,000 Americans. A medication granted orphan drug status is entitled to seven years of marketing exclusivity.

Phase II – second phase of medication development; typically involves several hundred patients to determine safety and preliminary data on efficacy.

Phase III – last phase of medication development; involves safety and efficacy trials of the new medication. This phase of development can take years to complete.

Priority review – designation granted by the FDA to an investigational agent after it has been submitted to the FDA for approval; a priority designation means that the FDA will review and take action on the application (approve or not approve) within six months instead of the standard 10 months for all other medication filings.

Pulmonary arterial hypertension – PAH.

Randomized controlled trial – a study in which people are allocated at random (by chance alone) to receive one of several clinical interventions; it is the most powerful study design in clinical research.

Rheumatoid arthritis – RA.

Respiratory syncytial virus – RSV.

Risk evaluation and mitigation strategy (REMS) – is a strategy to manage a known or potential serious risk associated with a drug or biological product. This strategy will be required if the FDA finds that a REMS is necessary to ensure that the benefits of the drug or biological product outweigh its risks.

Rolling submission – usually applies to fast track medications; indicates that the review process can be started even before the FDA receives all the information. However, the FDA requires all the information before a final decision about approval can be made.

sBLA – stands for “supplemental biologics license application,” similar to sNDA, but used for already approved investigational medications that are considered to be biologic agents.

sNDA – stands for “supplemental new drug application,” the process by which a pharmaceutical company submits information to the FDA to gain approval for a new indication for an agent that has already been approved by the FDA.

SPA – stands for “special protocol assessment,” an agreement with the FDA that the manufacturer’s clinical protocol for a phase III trial is acceptable to support an NDA or BLA.

Treatment-naïve – Patients who have never been treated before for a particular condition.

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