Walgreens

Pipeline Report

Information on recently approved, soon to be approved and phase III trial specialty medications.

Second quarter 2013

To help keep prescribers informed about medications in development, the Walgreens pipeline report provides a summary of the 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, recently approved or soon-to-be-approved specialty medications of interest to the marketplace. This report is not intended to be used by patients.

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.

Afatinib

Boehringer Ingelheim has developed afatinib, an orally administered irreversible ErbB family blocker that specifically inhibits epidermal growth factor receptor (EGFR or ErbB1), human epidermal growth factor receptor 2 (HER2 or ErbB2) and ErbB4. In January 2013, the FDA accepted a new drug application (NDA) for afatinib for the treatment of patients with locally advanced or metastatic non-small cell lung cancer (NSCLC) with an EGFR mutation.

In an open-label phase III trial, 345 patients with NSCLC and an EGFR activating mutation were randomized to afatinib 40 mg once daily or intravenous (IV) pemetrexed and cisplatin every three weeks for up to six cycles. The primary endpoint of the trial was progression-free survival (PFS). Median PFS was 11.1 months for afatinib and 6.9 months for pemetrexed and cisplatin. This difference was statistically significant. The most common adverse events in the afatinib group were diarrhea, rash and paronychia (skin infection around the nails).

The FDA granted priority review status to the NDA in January 2013. A response to the NDA is expected in the third quarter of 2013.

Vimizim

Vimizim is an investigational medication for the treatment of mucopolysaccharidosis type IVA (MPS IVA), also known as Morquio A syndrome. MPS IVA is a rare lysosomal storage disorder caused by a deficiency of N-acetylgalactosamine-6-sulfatase (GALNS). MPS IVA is characterized by short stature, skeletal abnormalities, cervical instability, limited endurance, visual and auditory impairment, oral health challenges, cardiovascular abnormalities and respiratory dysfunction.

There are currently no FDA-approved treatments for MPS IVA. Vimizim is an IV therapy that replaces the deficient GALNS. Vimizim was studied in a double-blind, placebo-controlled, phase III trial. Patients were randomized to an IV infusion of Vimizim 2 mg/kg weekly or every other week, or placebo weekly. The primary endpoint of the trial was change from baseline in endurance as measured by the six-minute walk distance (6MWD). After 24 weeks, patients receiving Vimizim weekly experienced a statistically significant change in the 6MWD with a mean increase of 22.5 meters over placebo.

Patients receiving Vimizim every other week did not experience a statistically significant change from baseline compared to placebo. The most common adverse events in the Vimizim groups were vomiting, fever, headache, nausea and cough.

BioMarin Pharmaceuticals plans to submit the first regulatory filing for Vimizim in the first quarter of 2013.

Fostamatinib
Fostamatinib is an orally administered spleen tyrosine kinase (Syk) inhibitor developed for the treatment of rheumatoid arthritis (RA). It blocks signaling in multiple cell types involved in inflammation and tissue degradation.

In a double-blind, placebo-controlled, phase IIb trial, 280 patients with RA who were naive to disease-modifying anti-rheumatic drugs (DMARDs), intolerant to DMARDs or had an inadequate response to DMARDs were randomized to fostamatinib, adalimumab or placebo. There were five groups: fostamatinib 100 mg twice daily; fostamatinib 100 mg twice daily for one month, followed by fostamatinib 150 mg once daily; fostamatinib 100 mg twice daily for one month, followed by fostamatinib 100 mg once daily; adalimumab 40 mg subcutaneous (SC) injection once every two weeks; and a placebo group.

Patients in the fostamatinib groups also receive placebo injections once every two weeks and patients in the adalimumab group received a placebo fostamatinib twice daily. This trial had two primary endpoints: a superiority comparison to placebo at six weeks and a noninferiority analysis to adalimumab at 24 weeks as measured by change from baseline in Disease Activity Score 28 (DAS28).

At six weeks, fostamatinib 100 mg twice daily and fostamatinib 100 mg twice daily for a month, followed by 150 mg once daily, demonstrated a statistically significant improvement in DAS28 compared to placebo. At 24 weeks, all fostamatinib doses were found to be inferior to adalimumab based on DAS28.

Additional phase III trials are ongoing with data expected in the first half of 2013. AstraZeneca expects to file an NDA in the fourth quarter of 2013.

Medications recently approved

Manufacturer/ Drug name	Indication	Mechanism of action/Drug class	Route of administration	Approval date	Comments
Cystic fibrosis					
Novartis/TOBI Podhaler (tobramycin)	For the management of cystic fibrosis (CF) patients with *Pseudomonas aeruginosa*	Disrupts protein synthesis/ Aminoglycoside antibiotic	Powder for inhalation	3/22/13	• First dry powder inhaled antibacterial for *Pseudomonas aeruginosa* approved by the FDA • Walgreens Specialty Pharmacy is a distributor of this medication
Familial lipid disorders					
Aegerion Pharmaceuticals/ Juxtapid (lomitapide)	As an adjunct to a low-fat diet and other lipid-lowering treatments, including low-density lipoprotein (LDL) apheresis where available, to reduce LDL cholesterol, total cholesterol (TC), apolipoprotein B (apo B) and non-high-density lipoprotein cholesterol (non-HDL-C) in patients with homozygous familial hypercholesterolemia (HoFH)	Interferes with the production of lipoproteins/ Microsomal triglyceride transfer protein inhibitor (MTP-I)	Oral	12/21/12	• First medication approved by the FDA to treat HoFH
Genzyme and Isis Pharmaceuticals/ Kynamro (mipomersen)	As an adjunct to lipid-lowering medications and diet to reduce LDL cholesterol, apo B, TC and non-HDL-C in patients with HoFH	Prevents the production of apo B/Apo B synthesis inhibitor	SC injection	1/29/13	• First systemic antisense medication approved by the FDA • Walgreens Specialty Pharmacy is a distributor of this medication
Inflammatory diseases					
Swedish Orphan Biovitrum (Sobi)/ Kineret (anakinra)	For the treatment of patients with neonatal-onset multisystem inflammatory disease	Inhibits interleukin-1 (IL-1) binding to the IL-1 type I receptor/IL-1 receptor antagonist	SC injection	12/21/12	• Previously approved for the treatment of RA
Multiple sclerosis					
Biogen Idec/ Tecfidera (dimethyl fumarate)	For the treatment of patients with relapsing forms of multiple sclerosis (MS)	Activates the nuclear factor-like 2 (Nrf2) pathway, which is involved in the response to oxidative stress/ Gene transcription modulator	Oral	3/27/13	• Walgreens Specialty Pharmacy is a distributor of this medication

Medications recently approved (continued)

Manufacturer/ Drug name	Indication	Mechanism of action/Drug class	Route of administration	Approval date	Comments
Neuroendocrine disorders					
Novartis Signifor (pasireotide)	For the treatment of adult patients with Cushing's disease for whom pituitary surgery is not an option or has not been curative	Binds somatostatin receptors/ Somatostatin analogue	SC injection	12/14/12	• Novel pituitary-directed therapy
Oncology					
Bayer HealthCare/ Stivarga (regorafenib)	For the treatment of patients with locally advanced, unresectable or metastatic gastrointestinal stromal tumor (GIST) in patients who have been previously treated with Gleevec (imatinib mesylate) and Sutent (sunitinib malate)	Reduces tumor cell growth and blood supply/Multikinase inhibitor	Oral	2/25/13	• Previously approved for the treatment of metastatic colorectal cancer (CRC)
Celgene Corporation/ Pomalyst (pomalidomide)	For the treatment of patients with multiple myeloma (MM) who have received at least two prior therapies including Revlimid (lenalidomide) and Velcade (bortezomib) and have demonstrated disease progression on or within 60 days of completion of the last therapy	Possesses immunomodulatory, anti-inflammatory and antiangiogenic properties/ Thalidomide analogue	Oral	2/8/13	• Walgreens Specialty Pharmacy is a distributor of this medication
Genentech/Kadcyla (ado-trastuzumab emtansine)	For the treatment of patients with HER2-positive, metastatic breast cancer who previously received Herceptin (trastuzumab) and a taxane, separately or in combination	Inhibits the proliferation of tumor cells that overexpress HER2/ HER2-targeted antibody and microtubule inhibitor conjugate	IV infusion	2/22/13	• Kadcyla is an antibody-drug conjugate
Primary immunodeficiency					
Biotest/Bivigam (immune globulin intravenous, human)	For the treatment of patients with primary humoral immunodeficiency	Replaces deficient immunoglobulin/ Replacement therapy	IV infusion	12/19/12	• First new IV immune globulin approved with a thrombin generation assay test • The test is used to detect procoagulant activity

Medications recently approved (continued)

Manufacturer/ Drug name	Indication	Mechanism of action/Drug class	Route of administration	Approval date	Comments
Short bowel syndrome					
NPS Pharmaceuticals/ Gattex (teduglutide)	For the treatment of adult patients with short bowel syndrome who are dependent on parenteral support	Enhances gastrointestinal absorption/ Analogue of glucagon-like peptide-2	SC injection	12/21/12	• Walgreens Infusion Services and Walgreens Specialty Pharmacy are distributors of this medication
Transplant					
Novartis/Zortress (everolimus)	For the prevention of organ rejection in patients receiving a liver transplant	Inhibits proliferation of T-cells/ Mammalian target of rapamycin inhibitor	Oral	2/15/13	• Previously approved for the prevention of organ rejection in patients receiving a kidney transplant
Urea cycle disorders					
Hyperion Therapeutics/ Ravicti (glycerol phenylbutyrate)	For use as a nitrogen-binding agent for chronic management of patients with urea cycle disorders who cannot be managed by dietary protein restriction and/or amino acid supplementation alone	Decreases elevated plasma ammonia levels/ Pre-pro-drug of phenylacetic acid	Oral	2/1/13	• Phenylacetic acid is the active ingredient of Buphenyl (sodium phenylbutyrate)

Pipeline medications in phase III trials

Manufacturer/ Drug name	Indication	Mechanism of action/Drug class	Route of administration	Comments
Bleeding disorders				
Baxter/BAX 326 (recombinant factor IX)	For the treatment and prevention of bleeding in patients with hemophilia B	Replaces deficient factor/Factor replacement therapy	IV infusion	• Biologics license application (BLA) filed September 2012 • A response to the BLA is expected July 2013
Baxter/OBI-1 (recombinant porcine factor VIII)	For the treatment of hemophilia A in patients with inhibitory antibodies	Replaces deficient factor/Factor replacement therapy	IV infusion	• FDA granted fast-track status • Baxter agreed to acquire OBI-1 from Inspiration Biopharmaceuticals
Biogen Idec/ Recombinant factor VIII Fc fusion protein	For the treatment and prevention of bleeding in patients with hemophilia A	Replaces deficient factor/Factor replacement therapy	IV infusion	• BLA filed March 2013
Biogen Idec/ Recombinant factor IX Fc fusion protein	For the treatment and prevention of bleeding in patients with hemophilia B	Replaces deficient factor/Factor replacement therapy	IV infusion	• BLA filed January 2013 • A response to the BLA is expected November 2013

Pipeline medications in phase III trials (continued)

Manufacturer/ Drug name	Indication	Mechanism of action/Drug class	Route of administration	Comments
Bleeding disorders				
Cangene Corporation/ IXinity (trenonacog alfa, IB1001)	For the treatment and prevention of bleeding in patients with hemophilia B	Replaces deficient factor/Factor replacement therapy	IV infusion	• BLA filed April 2012 • Received a complete response letter February 2013 • Cangene Corporation agreed to acquire IXinity from Inspiration Biopharmaceuticals
Novo Nordisk/ Turoctocog alfa (NN7008)	For the treatment and prevention of bleeding in patients with hemophilia A	Replaces deficient factor/Factor replacement therapy	IV infusion	• BLA filed October 2012 • A response to the BLA is expected August 2013
Chronic fatigue syndrome				
Hemispherx Biopharma/ Ampligen (rintatolimod)	For the treatment of chronic fatigue syndrome	Stimulates the immune system/Toll-like receptor 3 agonist	IV infusion	• Designated as an orphan drug • NDA accepted for review July 2008 • Received a complete response letter November 2009 • NDA resubmitted July 2012 • Received a complete response letter February 2013; the FDA recommended that an additional clinical trial be completed
Cystic fibrosis				
Vertex Pharmaceuticals/ Lumacaftor (VX-809)	In combination with Kalydeco (ivacaftor) in patients with CF who have two copies of the F508del mutation in the cystic fibrosis transmembrane conductance regulator (CFTR) gene	Increases the movement of CFTR to the cell surface/CFTR corrector	Oral	• FDA granted breakthrough therapy designation • Two phase III trials initiated February 2013 • Data from both studies expected in 2014, followed by NDA submission
Endocrine disorders				
NPS Pharmaceuticals/ Natpara (recombinant human parathyroid hormone)	For the treatment of hypoparathyroidism	Replaces deficient hormone/Hormone replacement therapy	SC injection	• BLA filing expected in the second half of 2013
Fertility				
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 endpoint achieved in phase III trial October 2012 • NDA filing anticipated in 2013

Pipeline medications in phase III trials (continued)

Manufacturer/ Drug name	Indication	Mechanism of action/Drug class	Route of administration	Comments
Hepatitis				
Gilead Sciences/ Sofosbuvir	In combination with ribavirin for the treatment of patients with genotype 2 or 3 chronic hepatitis C virus (HCV) infection who are not candidates for interferon	Prevents virus replication/Nucleotide analogue polymerase inhibitor	Oral	• First regulatory submission expected in mid-2013
Janssen and Medivir AB/Simeprevir (TMC435)	In combination with peginterferon alfa and ribavirin for the treatment of chronic HCV infection in treatment-naive and treatment-failure genotype 1 patients	Prevents virus replication/NS3/4A protease inhibitor	Oral	• FDA granted fast-track status • Phase III trials ongoing • NDA filing anticipated in the first half of 2013
Hereditary angioedema				
Pharming Group NV and Santarus/ Ruconest (C1 inhibitor)	For the treatment of acute attacks in patients with hereditary angioedema	Replaces deficient C1 inhibitor/C1 inhibitor replacement therapy	IV infusion	• Designated as an orphan drug • Primary endpoint achieved in phase III trial November 2012 • BLA filing is expected in the second quarter of 2013
Human immunodeficiency virus				
Gilead Sciences/ Cobicistat	To increase blood levels of certain protease inhibitors to enable once-daily dosing	Inhibits cytochrome P4503A/ Pharmacoenhancer	Oral	• NDA filed June 2012 • A response to the NDA is expected April 2013
Gilead Sciences/ Elvitegravir	For the treatment of human immunodeficiency virus (HIV) in treatment-experienced patients	Prevents virus replication/Integrase inhibitor	Oral	• NDA filed June 2012 • A response to the NDA is expected April 2013
ViiV Healthcare/ Dolutegravir	In combination with other antiretrovirals for the treatment of HIV	Prevents virus replication/Integrase inhibitor	Oral	• NDA filed December 2012 • FDA granted priority review status • A response to the NDA is expected August 2013
Inflammatory diseases				
AstraZeneca/ Fostamatinib	For the treatment of RA	Blocks signaling in multiple cell types involved in inflammation and tissue degradation/ Syk inhibitor	Oral	• First set of data from phase III trials expected in the first half of 2013 • NDA filing planned in the fourth quarter of 2013
Celgene/Apremilast	For the treatment of psoriatic arthritis (PsA) and psoriasis	Modulates the inflammatory response/ Phosphodiesterase type 4 (PDE4) inhibitor	Oral	• NDA filing for PsA is expected in the first quarter of 2013 • NDA filing for psoriasis is expected in the second half of 2013

Pipeline medications in phase III trials (continued)

Manufacturer/ Drug name	Indication	Mechanism of action/Drug class	Route of administration	Comments
Inflammatory diseases				
Novartis/ Secukinumab (AIN457)	For the treatment of plaque psoriasis	Interferes with the inflammatory response/ IL-17A inhibitor	SC injection	• Results from phase III trial expected in 2013, with regulatory submissions to follow shortly thereafter
Lysosomal storage diseases				
Amicus Therapeutics and GlaxoSmithKline/ Amigal (migalastat HCl)	For the treatment of Fabry disease	Binds to and stabilizes alpha-galactosidase/ Alpha-galactosidase A enhancer	Oral	• Designated as an orphan drug • Primary endpoint not achieved in Stage 1 of first phase III trial December 2012 • Stage 2 results are expected in the second quarter of 2013
BioMarin Pharmaceuticals/ Vimizim (GALNS)	For the treatment of MPS IVA (Morquio A syndrome)	Replaces deficient GALNS/Enzyme replacement therapy	IV infusion	• First regulatory submission is expected in the first quarter of 2013
Genzyme/Eliglustat	For the treatment of Gaucher disease	Reduces the production of glucocerebroside/ Glucosylceramide synthase inhibitor	Oral	• Designated as an orphan drug • Primary endpoint achieved in first phase III trial October 2012 • Primary endpoint achieved in second phase III trial February 2013
Multiple sclerosis				
Biogen Idec/Plegridy (peginterferon beta-1a)	For the treatment relapsing-remitting MS	Unknown mechanism of action in MS/Interferon	SC injection	• Dosed once every two weeks or four weeks • FDA granted fast-track status • BLA filing expected in mid-2013
Teva Pharmaceuticals/ Laquinimod	For the treatment of relapsing-remitting MS	Inhibits autoimmune and inflammatory disease activity/ Immunomodulatory agent	Oral	• First patient enrolled in third phase III trial March 2013 • This trial is being conducted under a special protocol assessment (SPA)
Neurogenic disorders				
Chelsea Therapeutics/ Northera (droxidopa)	For the treatment of symptomatic neurogenic orthostatic hypotension in patients with primary autonomic failure, dopamine beta-hydroxylase deficiency and nondiabetic autonomic neuropathy	Increases norepinephrine levels in the nervous system/Synthetic catecholamine	Oral	• Designated as an orphan drug with fast-track status • NDA filed September 2011 • Received a complete response letter March 2012 • NDA resubmission planned for the first quarter of 2013

Pipeline medications in phase III trials (continued)

Manufacturer/ Drug name	Indication	Mechanism of action/Drug class	Route of administration	Comments
Neutropenia				
Teva Pharmaceuticals/ Lipegfilgrastim	To reduce the duration of severe neutropenia in cancer patients undergoing chemotherapy	Long-acting granulocyte colony-stimulating factor	SC injection	• BLA filed December 2012
Oncology				
AVEO Oncology and Astellas/ Tivopath (tivozanib)	For the treatment of advanced renal cell carcinoma (RCC)	Reduces tumor cell growth and blood supply/VEGF receptor inhibitor	Oral	• NDA filed September 2012 • A response to the NDA is expected July 2013
Bayer HealthCare/ Alpharadin (radium-223 chloride)	For the treatment of patients with castration-resistant prostate cancer (CRPC) and bone metastases	Mimics the behavior of calcium in the bone to target areas of high bone turnover in and around bone metastases/ Alpha-pharmaceutical	IV infusion	• FDA granted fast-track status • NDA filed December 2012 • FDA granted priority review status • A response to the NDA is expected June 2013
Boehringer Ingelheim/ Afatinib	For the treatment of locally advanced or metastatic NSCLC	Inhibits cell growth and survival/Irreversible ErbB family blocker	Oral	• FDA granted fast-track status • FDA accepted NDA for filing and granted priority review status January 2013 • A response to the NDA is expected in the third quarter of 2013
Cell Therapeutics/ Opaxio (paclitaxel poliglumex)	For the treatment of ovarian cancer	Inhibits cell division/Microtubule inhibitor	IV infusion	• Links paclitaxel to a biodegradable polyglutamate polymer that delivers more chemotherapy to tumor cells • An independent data safety monitoring board recommended continuation of phase III trial after first interim analysis January 2013
Eisai/Lenvatinib	For the treatment of thyroid cancer	Inhibits cell growth and survival/Tyrosine kinase inhibitor (TKI)	Oral	• Designated as an orphan drug • NDA filing planned for 2013
GlaxoSmithKline/ Dabrafenib	For the treatment of BRAF V600 positive melanoma	Inhibits cell growth and survival/BRAF kinase inhibitor	Oral	• Designated as an orphan drug • NDA filed July 2012 • A response to the NDA is expected May 2013
GlaxoSmithKline/ Trametinib	For the treatment of BRAF V600 positive melanoma	Inhibits cell growth and survival/Mitogen-activated protein/ extracellular signal-regulated kinase (MEK) inhibitor	Oral	• Designated as an orphan drug • NDA filed August 2012 • A response to the NDA is expected June 2013

Pipeline medications in phase III trials (continued)

Manufacturer/ Drug name	Indication	Mechanism of action/Drug class	Route of administration	Comments
Oncology				
Novartis/Dovitinib	For the treatment of RCC	Inhibits cell growth and survival/Fibroblast growth factor receptor inhibitor	Oral	• NDA filing planned for 2013
Novartis/ Panobinostat	For the treatment of relapsed or refractory MM	Inhibits cell growth and survival/Histone deacetylase inhibitor	Oral	• Regulatory filings planned for 2013
Onconova Therapeutics/ Rigosertib	For the treatment of refractory myelodysplastic syndromes (MDS)	Targets alpha and beta isoforms of PI-3 kinases/Multikinase inhibitor	IV infusion	• An oral formulation is also in development • Phase III data expected in the fourth quarter of 2013
Pharmacyclics/ Ibrutinib	For the treatment of relapsed or refractory mantle cell lymphoma (MCL) and for the treatment of Waldenstrom's macroglobulinemia	Inhibits cell growth and survival/Bruton's tyrosine kinase (BTK) inhibitor	Oral	• FDA granted breakthrough therapy designation • NDA filing for MCL planned for the end of 2013
Spectrum Pharmaceuticals/ Belinostat	For the treatment of relapsed or refractory peripheral T-cell lymphoma	Inhibits cell growth and survival/Histone deacetylase inhibitor	IV infusion	• Designated as an orphan drug • NDA filing planned for mid-2013
Pulmonary arterial hypertension				
Actelion/Opsumit (macitentan)	For the treatment of pulmonary arterial hypertension (PAH)	Reduces vascular smooth muscle constriction/ Endothelin receptor antagonist	Oral	• Designated as an orphan drug • NDA filed October 2012
Bayer HealthCare/ Riociguat	For the treatment of chronic thromboembolic pulmonary hypertension and PAH	Reduces vascular smooth muscle constriction/Soluble guanylate cyclase stimulator	Oral	• NDA filed February 2013
Thrombocytopenia				
Eisai/Avatrombopag	For the treatment of chronic immune thrombocytopenia	Stimulates platelet production/ Thrombopoietin receptor agonist	Oral	• NDA filing planned for 2013

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					
Pharmaxis/ Bronchitol (mannitol)	For the treatment of CF	Hydrates the lungs/Osmotic diuretic	IV infusion, inhalation	Inhalation	• Designated as an orphan drug • NDA filed May 2012 • Received a complete response letter March 2013
Inflammatory diseases					
Genentech/ Actemra (tocilizumab)	For the treatment of RA	Blocks IL-6 receptors/ Monoclonal antibody	SC injection	IV infusion	• BLA filed December 2012 • A response to the BLA is expected October 2013
Janssen/Simponi (golimumab)	For the treatment of RA	Targets tumor necrosis factor (TNF) alpha, which is involved in the inflammatory process/TNF inhibitor	SC injection	IV infusion	• BLA filed September 2012 • A response to the BLA is expected July 2013
Lysosomal storage diseases					
Raptor Pharmaceuticals/ Procysbi (cysteamine bitartrate delayed-release)	For the treatment of nephropathic cystinosis	Reduces cystine levels in cells/ Aminothiol	Oral	Oral	• Formulated to be sprinkled onto food for administration • Designated as an orphan drug • NDA filed March 2012 • A response to the NDA was expected January 2013; however, the FDA has extended the review period • A response is expected April 2013
Multiple sclerosis					
Biogen Idec and Abbott/ Daclizumab HYP (high-yield process)	For the treatment of relapsing-remitting MS	Binds to the CD25 receptor on T cells/Therapeutic antibody	IV infusion	SC injection	• Phase III results expected in 2014 • Marketed as Zenapax for the prevention of acute kidney rejection
Teva Pharmaceutical/ Copaxone (glatiramer acetate)	For the treatment of relapsing-remitting MS	Modulates the immune system/ Disease modifying therapy	SC injection	SC injection	• Higher dose formulation administered three times a week instead of daily • NDA filing is expected in the first quarter of 2013
Neuroendocrine disorders					
Novartis/ Signifor LAR (pasireotide long-acting release)	For the treatment of acromegaly	Binds somatostatin receptors/ Somatostatin analogue	SC injection	Intramuscular (IM) injection	• Monthly IM injection • Filing planned for 2013

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
Oncology					
Roche/Herceptin (trastuzumab)	For the treatment of HER2-positive early breast cancer	Inhibits the proliferation of tumor cells that overexpress HER2/Monoclonal antibody	IV infusion	SC injection	• Coprimary endpoints achieved in phase III trial October 2011 • Additional studies are currently ongoing
Pulmonary arterial hypertension					
United Therapeutics/ Treprostinil diolamine	For the treatment of PAH	Dilates pulmonary blood vessels/ Prostacyclin analogue	Continuous SC or IV infusion and inhalation	Oral	• NDA filing accepted February 2012 • Received a complete response letter October 2012 • Resubmitted NDA accepted by the FDA • Received second complete response letter March 2013

*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
Bleeding disorder					
Baxter/Feiba NF (anti-inhibitor coagulant complex)	For the treatment of bleeding episodes or to cover surgical interventions in patients with hemophilia A or B with inhibitors	For the prevention of bleeding in patients with hemophilia A or B and inhibitors	Replaces deficient factor/ Factor replacement therapy	IV infusion	• Supplemental biologics license application (sBLA) filed February 2013
Inflammatory diseases					
Genentech/ Actemra (tocilizumab)	For the treatment of RA and systemic juvenile idiopathic arthritis (SJIA)	For the treatment of polyarticular juvenile idiopathic arthritis	Blocks IL-6 receptors/ Monoclonal antibody	IV infusion	• sBLA filed June 2012 • A response to the sBLA is expected April 2013
Janssen/Simponi (golimumab)	For the treatment of RA, PsA and ankylosing spondylitis	For the treatment of ulcerative colitis	Targets TNF-alpha, which is involved in the inflammatory process/TNF inhibitor	SC injection	• sBLA filed July 2012 • A response to the sBLA is expected May 2013
Janssen/Stelara (ustekinumab)	For the treatment of psoriasis	For the treatment of PsA	Targets IL-12 and IL-23/Dual IL inhibitor	SC injection	• sBLA filed December 2012

New indications in the pipeline (continued)

Manufacturer/ Drug name	Current indication	Investigational indication	Mechanism of action/Drug class	Route of administration	Comments
Inflammatory diseases					
Novartis/Ilaris (canakinumab)	For the treatment of cryopyrin-associated periodic syndromes (CAPS)	For the treatment of SJIA	Targets IL-1 beta/IL-1 beta inhibitor	SC injection	• sBLA filed in the fourth quarter of 2012
Novartis/Xolair (omalizumab)	For the treatment of allergic asthma	For the treatment of chronic idiopathic urticaria	Inhibits the binding of immunoglobulin E (IgE)/IgE-directed antibody	SC injection	• Regulatory submissions planned for 2013
UCB Pharma/ Cimzia (certolizumab pegol)	For the treatment of Crohn's disease and RA	For the treatment of PsA and axial spondyloarthritis	Targets TNF alpha, which is involved in the inflammatory process/TNF inhibitor	SC injection	• sBLA filed and under FDA review February 2013
Multiple sclerosis					
Biogen Idec and Elan/Tysabri (natalizumab)	For the treatment of relapsing forms of MS (generally recommended for patients who have had an inadequate response to, or are unable to tolerate, an alternate MS therapy) and for the treatment of Crohn's disease	For the first-line treatment of relapsing forms of MS in patients who have tested negative for antibodies to the JC virus	Binds and inhibits alpha-4 integrins from adhering to their counter-receptors/ Selective adhesion molecule inhibitors	IV infusion	• sBLA filed January 2013
Genzyme/ Lemtrada (alemtuzumab)	For the treatment of B-cell chronic lymphocytic leukemia (CLL)	For the treatment of relapsing MS	Binds to the CD52 antigen on B cells and T cells/ Therapeutic antibody	IV infusion	• FDA granted fast-track status • sBLA filed June 2012 • Received a refuse to file letter from the FDA August 2012 • Resubmitted sBLA accepted for review • A response to the sBLA is expected in the second half of 2013 • Marketed as Campath for CLL indication

New indications in the pipeline (continued)

Manufacturer/ Drug name	Current indication	Investigational indication	Mechanism of action/Drug class	Route of administration	Comments
Oncology					
Astellas/Tarceva (erlotinib)	For the treatment of NSCLC after failure of at least one prior chemo-therapy regimen, for maintenance treatment of NSCLC and for the treatment of pancreatic cancer	For the first-line treatment of EGFR-mutation-positive NSCLC	Reduces tumor cell growth and blood supply/ TKI	Oral	• Supplemental new drug application (sNDA) filed November 2012 • FDA granted priority review status • A response to the sNDA is expected May 2013
Celgene/ Abraxane (paclitaxel protein-bound particles)	For the treatment of metastatic breast cancer and metastatic NSCLC	For the treatment of pancreatic cancer	Inhibits cell division/ Microtubule inhibitor	Intravenous infusion	• Primary endpoint achieved in phase III trial November 2012 • sNDA filing expected during the first half of 2013
Celgene/ Revlimid (lenalidomide)	For the treatment of patients with MM and MDS	For the treatment of relapsed or refractory MCL	Possesses immuno-modulatory, anti-inflammatory and antiangiogenic properties/ Thalidomide analogue	Oral	• sNDA accepted and assigned priority review • A response to the sNDA is expected June 2013
Novartis/Tasigna (nilotinib)	For the treatment of chronic and accelerated phase Philadelphia chromosome-positive chronic myeloid leukemia (Ph+ CML) in patients resistant or intolerant to prior therapy that included Gleevec, and for the first-line treatment of Ph+ CML	For the treatment of c-Kit-positive melanoma	Inhibits cell growth and survival/TKI	Oral	• sNDA planned for 2014
Peyronie's disease					
Auxilium Pharmaceuticals/ Xiaflex (collagenase clostridium histolyticum)	For the treatment of Dupuytren's contracture with a palpable cord	For the treatment of Peyronie's disease	Breaks down collagen deposits/ Purified collagenase	Injection	• Designated as an orphan drug • sBLA filed November 2012 • A response to the sBLA is expected September 2013

Glossary of terms

Antibody-drug conjugate – consists of a monoclonal antibody linked to a cytotoxic drug.

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

Breakthrough therapy designation – intended to expedite the development and review of a potential new drug for serious or life-threatening diseases.

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.

Fast track – 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 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.

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.

Refusal to file letter – a letter the FDA issues to the applicant if it determines the application is not sufficiently complete.

Rheumatoid arthritis – RA.

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-naive – patients who have never been treated before for a particular condition.

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Manufacturers' websites

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Information in the report is current as of March 2013, and was accessed on March 27, 2013.