

# Specialty Pharmacy Pipeline Report

Fourth Quarter 2007

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 U.S. Food and Drug Administration (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. It also highlights selected, 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.

### Nexavar® (sorafenib)

Bayer HealthCare Pharmaceuticals and Onyx Pharmaceuticals have gained another indication for their oral oncology product, Nexavar®. In December 2005, Nexavar was approved for the treatment of advanced renal cell carcinoma. In June 2007, the companies filed a Supplemental New Drug Application (sNDA) for the treatment of liver cancer.

Positive results were reported from an international phase III trial comparing Nexavar to placebo in patients with liver cancer. Median overall survival was 10.7 months in the Nexavar group compared with 7.9 months in the placebo group. Based on this data, the companies submitted an sNDA, and were granted a priority review of the application. In November 2007, the FDA approved Nexavar for the treatment of

unresectable (cannot be removed with surgery) hepatocellular carcinoma, the most common type of liver tumor. It is the first systemic medication approved for the treatment of liver cancer.

Liver cancer is the third leading cause of cancer-related deaths worldwide. In the United States, an estimated 17,000 deaths from liver cancer are expected by the end of this year. Liver cirrhosis, or scarring of the liver tissue, is the cause in 80 percent of these cancers. Chronic infections with hepatitis B or hepatitis C virus, along with heavy alcohol use, are the major risk factors for developing cirrhosis.

### Golimumab

Golimumab is a next generation, fully human anti-tumor necrosis factor (TNF) alpha monoclonal antibody developed by Centocor and Schering-Plough. It is currently under investigation for a number of indications, including the treatment of rheumatoid arthritis, psoriatic arthritis, and ankylosing spondylitis.

There are three FDA-approved anti-TNF medications on the market: Enbrel® (etanercept), Humira® (adalimumab), and Remicade® (infliximab). Similar to golimumab, Remicade and Humira are also monoclonal antibodies, while Enbrel is a fusion protein. Remicade is dosed every eight weeks for maintenance therapy and is administered as an intravenous (IV) infusion. Enbrel and Humira are administered through a subcutaneous (SC) injection weekly or every other week, respectively. In contrast to these agents, golimumab is being studied for SC injection every four weeks and for IV infusion every 12 weeks.

The companies have reported that they plan to submit a Biologic License Application (BLA) in the first half of 2008 for the SC administration of golimumab for one of the investigational indications.

### Ustekinumab

Centocor has also developed ustekinumab, another fully human monoclonal antibody for the treatment of moderate to severe plaque psoriasis. Ustekinumab is a dual interleukin inhibitor that targets interleukin-12 and interleukin-23, which are thought to play a role in immune-mediated inflammatory conditions such as psoriasis. Psoriasis is a chronic skin condition characterized by scaling and inflammation. Approximately 2.1 percent of Americans have been diagnosed with psoriasis.

In a current study, ustekinumab, at a dose of 45 mg or 90 mg, is being compared to placebo. The medications are administered by SC injection at the start of the study, four weeks later, and then every 12 weeks thereafter. If the patient only partially responds to the starting dose, the dosing interval may be reduced to every eight weeks. The preliminary data show that after two doses, 67 percent of patients treated with 45 mg ustekinumab and 76 percent of patients treated with 90 mg ustekinumab had at least a 75 percent reduction in psoriasis compared with only four percent of patients receiving placebo. Centocor plans to file a BLA with the FDA by the end of 2007.

### Lestaurtinib

Lestaurtinib is an oral medication under investigation for the treatment of acute myeloid leukemia (AML). AML is a type of blood and bone marrow cancer that causes the body to make abnormal white blood cells, the cells that help fight infection. This type of leukemia is very aggressive—less than half of patients diagnosed with AML will be long-term survivors. In 2007, the American Cancer Society estimates that there will be nearly 13,500 new cases of AML and approximately 9,000 deaths.

Almost one third of patients have a mutation in the gene that codes for FLT3 (FMS-like tyrosine kinase-3), a receptor that has been found to be overexpressed in most patients with AML. A mutation in FLT3 increases the risk of AML relapse and reduces the time of survival. Lestaurtinib has been shown to inhibit this FLT3 mutation. Results from a phase II trial demonstrated a 45 percent overall response rate in patients who received chemotherapy plus lestaurtinib compared with 27 percent of patients who underwent chemotherapy alone.

The FDA has designated lestaurtinib as an orphan drug. Cephalon, the manufacturer, plans to submit a New Drug Application (NDA) for the treatment of AML in the first half of 2008.

## Medications Recently Approved

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Approval Date	Comments
<b>Acromegaly</b>					
Tercica and Ipsen/ Somatuline® Depot (lanreotide)	For long-term treatment of acromegalic patients who have had an inadequate response to surgery and/or radiotherapy, or for whom surgery and/or radiotherapy is not an option	Binds to somatostatin receptors leading to a decrease in growth hormone levels/ Somatostatin analogue	SC injection	08/30/07	Available in a prefilled syringe.
<b>Anemia</b>					
Roche/ Mircera® (methoxy polyethylene glycol-epoetin beta), formerly CERA, R744	For the treatment of anemia associated with chronic renal failure, including patients on dialysis, as well as those not on dialysis	Stimulates red blood cell production/ CERA (continuous erythropoietin receptor activator)	SC or IV injection	11/14/07	In October 2007, a jury ruled that Roche is not allowed to launch the product because they have violated the patents that Amgen has on this class of medications.
<b>Human Immunodeficiency Virus (HIV)</b>					
Merck/ Isentress™ (raltegravir), formerly MK-0518	In combination with other antiretroviral agents for the treatment of HIV-1 infection in treatment-experienced adult patients who have evidence of viral replication and HIV-1 strains resistant to multiple antiretroviral agents	Inhibits the insertion of the HIV viral DNA into human DNA/ Integrase inhibitor	Oral	10/12/07	First in a new class of oral HIV medications.
<b>Oncology</b>					
Bayer HealthCare Pharmaceuticals and Onyx Pharmaceuticals/ Nexavar® (sorafenib)	For the treatment of unresectable hepatocellular carcinoma	Reduces tumor cell growth and blood supply/Multikinase inhibitor	Oral	11/19/07	Previously approved for the treatment of advanced renal cell carcinoma.  <i>Walgreens Specialty Pharmacy is a preferred distributor, a distinction given to a select number of specialty pharmacies based on criteria established by the pharmaceutical company.</i>
Bristol-Myers Squibb/ Ixempra™ (ixabepilone)	In combination with Xeloda® (capecitabine) for the treatment of metastatic or locally advanced breast cancer in patients after failure of an anthracycline and a taxane  Also, used alone for the treatment of metastatic or locally advanced breast cancer in patients after failure of an anthracycline, a taxane, and capecitabine	Inhibits the growth and development of cancer cells/Epothilone B analog	IV infusion	10/16/07	Represents a novel class of antineoplastic agents.

## Medications Recently Approved (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Approval Date	Comments
<b>Oncology</b>					
GlaxoSmithKline/ Hycamtin® (topotecan)	For the treatment of relapsed small cell lung cancer in patients who have completely or partially responded to chemotherapy and who are at least 45 days from the end of first-line chemotherapy	Damages the DNA of cancer cells resulting in cancer cell death/ Topoisomerase I inhibitor	Oral	10/12/07	Launch expected in 2008.
Novartis/ Tasigna® (nilotinib)	For the treatment of chronic phase and accelerated phase Philadelphia chromosome positive (Ph+) chronic myelogenous leukemia (CML) in adult patients resistant or intolerant to prior therapy that included Gleevec® (imatinib)	Inhibits Bcr-Abl, the definitive cause of Ph+ CML/Tyrosine kinase inhibitor	Oral	10/29/07	
<b>Osteoporosis</b>					
Novartis/ Reclast® (zoledronic acid)	For the treatment of osteoporosis in postmenopausal women	Inhibits osteoclast-mediated bone resorption/IV bisphosphonate	IV infusion	08/17/07	Previously approved for the treatment of Paget's disease.

## Pipeline Medications in Phase III Trials

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Amyloid A Amyloidosis</b>				
Neurochem/ Kiacta™ (eprodisate), formerly Fibrillex™	For the treatment of Amyloid A amyloidosis	Reduces amyloid protein deposition/Amyloid fibrillogenesis inhibitor	Oral	Designated as an orphan drug. NDA filed February 2006. FDA granted priority review status April 2006. First approvable letter August 2006. Second approvable letter July 2007—the FDA requested additional data.
<b>Cystic Fibrosis</b>				
Inspire Pharmaceuticals/ Denufosol	For the treatment of cystic fibrosis	Designed to enhance mucosal hydration and mucociliary clearance/Second generation P2Y <sub>2</sub> agonist	Inhalation	Designated as an orphan drug with fast track status. Phase III trials initiated July 2006. Full enrollment for first phase III study completed October 2007. Results from this study are expected mid-2008.
<b>Hemophilia</b>				
Wyeth/ ReFacto® AF (antihemophilic factor)	For the treatment of hemophilia	Blood clotting factor/ Recombinant factor VIII	Infusion	Launch anticipated in 2008.

## Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Hepatitis</b>				
Valeant Pharmaceuticals/ Viramidine® (taribavirin)	For the treatment of chronic hepatitis C virus infection in combination with pegylated interferon alfa-2b	Reduces virus synthesis/Antiviral (synthetic nucleoside analogue)	Oral	Prodrug of ribavirin. Enrollment for a phase II trial using a weight-based dose of Viramidine initiated March 2007. Based on an early review of this study, Valeant will decide whether to begin a third phase III study at the weight-based dose.
<b>Human Immunodeficiency Virus (HIV)</b>				
Tibotec Therapeutics and J&J/ Etravirine, formerly TMC125	For the treatment of non-nucleoside reverse transcriptase inhibitor (NNRTI)-resistant HIV infection	Inhibits viral DNA replication/NNRTI	Oral	Studied in combination with Prezista™ (darunavir), Tibotec's protease inhibitor. NDA filed July 2007. FDA granted priority review status September 2007. A response to the NDA is expected January 2008. Available through an expanded access program.
<b>Inflammatory Diseases</b>				
Centocor and Schering-Plough/ Golimumab	For the treatment of rheumatoid arthritis, psoriatic arthritis, and ankylosing spondylitis	Targets tumor necrosis factor (TNF) alpha, which is involved in the inflammatory process/ Anti-TNF inhibitor	SC injection	BLA filing planned for the first half of 2008.
Regeneron/ Rilonacept (interleukin-1 trap)	For the treatment of cryopyrin-associated periodic syndrome	Binds and neutralizes interleukin-1 (IL-1)/ Long-acting IL-1 inhibitor	SC injection	Designated as an orphan drug with fast track status. BLA filed June 2007. FDA granted priority review status August 2007. In October 2007, Regeneron submitted additional information to the FDA, resulting in a three-month extension to the review period for the FDA. A response to the BLA is now expected February 2008.
UCB/ Cimzia™ (certolizumab pegol)	For the treatment of moderate to severe or active Crohn's disease, moderate to severe or active rheumatoid arthritis, and moderate to severe psoriasis	Targets TNF alpha, which is involved in the inflammatory process/ Anti-TNF inhibitor	SC injection	BLA for the treatment of moderate to severe Crohn's disease filed March 2006. FDA requested more information December 2006. UCB will conduct a short-term efficacy study to confirm the induction of clinical response in Crohn's disease. Results from this study are expected in the second half of 2008. The company plans to file a BLA for the treatment of rheumatoid arthritis fourth quarter of 2007.

## Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Multiple Sclerosis</b>				
Novartis/ Fingolimod, formerly FTY720	For the treatment of relapsing-remitting multiple sclerosis (MS)	Reduces inflammation and myelin damage in the brain and spinal cord/ Immunomodulatory agent	Oral	NDA filing planned for 2009. Also in phase III trials for the prevention of kidney transplant rejection.
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).
<b>Oncology</b>				
Adventrx/ CoFactor® (ANX-510)	For the treatment of metastatic colorectal cancer in combination with 5-fluorouracil (5-FU)	Binds 5-FU to the enzyme thymidylate synthase/Folate biomodulator	IV injection	Adventrx will stop enrolling patients in the phase III trial of CoFactor for the treatment of metastatic colorectal cancer based on a slow accrual rate, as noted in the recommendations from the Data Safety Monitoring Board. However, Adventrx will continue its phase II trial of CoFactor for the treatment of advanced breast cancer.
Cell Therapeutics/ Xyotax™ (paclitaxel poliglumex)	For the treatment of advanced non-small cell lung cancer in women	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. Received Special Protocol Assessment (SPA) approval from the FDA for phase III trial September 2007. FDA granted fast track status.
Celtic Pharma and Neurobiological Technologies/ Xerecept® (corticotropin)	For the treatment of peritumoral cerebral edema	Reduces edema/ Synthetic human corticotropin releasing factor	SC injection	Designated as an orphan drug. NDA filing planned for 2008.
Cephalon/ Lestaurtinib	For the treatment of acute myeloid leukemia	Inhibits FLT3 mutations/FLT3 inhibitor	Oral	Designated as an orphan drug. NDA filing planned for first half of 2008.
Cephalon/ Treanda® (bendamustine)	For the treatment of chronic lymphocytic leukemia (CLL) and for the treatment of non-Hodgkin's lymphoma (NHL) in patients who failed Rituxan® (rituximab)	Causes cell death and disrupts cell division/ Hybrid alkylating agent	IV infusion	Designated as an orphan drug for the treatment of CLL. NDA filed September 2007 for the treatment of CLL. NDA filing for NHL anticipated by end of 2007.
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. Approvable letter May 2007—the FDA will accept either a positive interim or final analysis of survival from the ongoing phase III trial to amend the BLA. Dendreon anticipates an interim analysis of survival second half of 2008.

## Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Oncology</b>				
GPC Biotech and Spectrum Pharmaceuticals/ Orplatna (satraplatin)	In combination with prednisone for the treatment of HRPC in patients whose prior chemotherapy has failed	Binds to the DNA of cancer cells and prevents replication/ Platinum chemotherapy agent	Oral	NDA filed February 2007. NDA withdrawn July 2007 based on the FDA Advisory Committee's recommendation that the FDA should wait for the final survival analysis from the ongoing phase III trial before deciding on approval. In October 2007, the overall survival results were reported as nonsignificant. Based on these results, GPC Biotech is re-evaluating its plans for satraplatin, including the current expanded access program.
Intarcia Therapeutics/ Atamestane	For first-line treatment of hormone-dependent breast cancer in combination with estrogen receptor blocker Fareston® (toremifene)	Interferes with estradiol production/ Steroidal aromatase inhibitor	Oral	Phase III studies ongoing.
Lorus Therapeutics/ Virulizin®	For first-line treatment of advanced pancreatic cancer in combination with Gemzar® (gemcitabine)	Increases the cytogenic effects of macrophages/ Biologic response modifier	IM injection	Rolling NDA accepted July 2005. Designated as an orphan drug with fast track status.
Marshall Edwards/ Phenoxodiol	For the treatment of HRPC in Taxotere® (docetaxel) nonresponders and recurrent chemotherapy-resistant, late-stage ovarian cancer	Causes cell death through inhibition of antiapoptotic proteins/ Antineoplastic (multiple signal transduction regulator)	IV injection/Oral	FDA granted fast track status.
MGI PHARMA/ Saforis™ (glutamine in UpTec™)	For the prevention and treatment of chemotherapy-induced oral mucositis	Promotes healing and prevents damage to mucosa/Amino acid	Oral	NDA filed April 2006. FDA granted priority review status. Approvable letter October 2006. The FDA requested an additional phase III efficacy trial.
Novartis and Bayer Schering Pharma AG/ Vatalanib	For the treatment of metastatic colorectal cancer in combination with oxaliplatin, 5-FU, and leucovorin	Inhibits formation of blood vessels that supply nutrients to tumors/Tyrosine kinase inhibitor	Oral	NDA filing planned for 2007.

## Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Oncology</b>				
Protherics PLC/ Voraxaze™ (glucarpidase), formerly Carboxy- peptidase G2	Adjunctive therapy for cancer patients undergoing chemotherapy who are at risk for methotrexate toxicity	Rapidly reduces serum methotrexate levels/Recombinant enzyme	IV injection	Designated as an orphan drug with fast track status. BLA originally filed September 2006 and resubmitted November 2006. FDA requested additional information and agreed to let Protherics resubmit its BLA as a rolling submission starting first half of 2008. Available through an expanded access program.
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 2009.
<b>Osteoporosis</b>				
Amgen/ Denosumab	For the treatment of postmenopausal osteoporosis (PMO) and treatment-induced bone loss	Inhibits bone destruction/ Monoclonal antibody	SC injection	All endpoints were met in the phase III trial for treatment-induced bone loss. Amgen anticipates completing a review of all the PMO data second half of 2008.
NPS Pharmaceuticals/ Preos® (parathyroid hormone)	For the treatment of PMO	Stimulates new bone growth/Recombinant human parathyroid hormone	SC injection	NDA filed May 2005. Approvable letter March 2006. Finalized the protocol design for a new phase IIIb clinical trial March 2007. NPS is reviewing its development and commercialization options for Preos in PMO and expects to make a decision in the first quarter of 2008.
<b>Phenylketonuria</b>				
BioMarin and Merck Serono/ Kuvan™ (sapropterin), formerly Phenoptin™	For the treatment of phenylketonuria	Enhances the activity of phenylalanine hydroxylase resulting in decreased levels of phenylalanine/ Enzyme cofactor	Oral	Designated as an orphan drug with fast track status. NDA filed May 2007. FDA granted priority review status July 2007. A response to the NDA was expected by November 2007; however, due to staffing constraints at the FDA, the response will be delayed until December 2007. Available through an expanded access program.
<b>Psoriasis</b>				
Centocor/ Ustekinumab	For the treatment of moderate to severe plaque psoriasis	Targets interleukin-12 and interleukin-23/ Dual interleukin inhibitor	SC injection	NDA filing planned by end of 2007.

## Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Pulmonary Arterial Hypertension</b>				
Encysive Pharmaceuticals/ Theelin™ (sitaxsentan)	For the treatment of pulmonary arterial hypertension	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. Encysive filed a request with the FDA for formal dispute resolution to contest the third approvable letter August 2007. However, instead of pursuing the formal dispute resolution process, Encysive plans to conduct an additional phase III study.
<b>Respiratory Syncytial Virus</b>				
MedImmune and AstraZeneca/ Numax® (motavizumab)	For the prevention of respiratory syncytial virus (RSV) infection in high-risk pediatric populations	Inhibits RSV replication/ Monoclonal antibody	IM injection	Expected to be more potent than Synagis® (palivizumab), which is the current standard of care for the prevention of RSV. BLA filing planned for fourth quarter 2007. Pending approval, launch anticipated during the 2008-2009 RSV season.
<b>Rheumatoid Arthritis</b>				
Roche and Chugai/ Actemra™ (tocilizumab)	For the treatment of rheumatoid arthritis	Blocks interleukin-6 receptors/Monoclonal antibody	IV infusion	BLA filed November 2007.
<b>Transplant</b>				
Fresenius Medical Care AG and Nabi/ (ATG-Fresenius S)	For the prevention of graft-versus-host disease in lung transplantation	Targets a range of antigens on activated T-cells/Polyclonal antibody	Injection	BLA filing expected early 2009. FDA granted fast track status.
Novartis/ Certican™ (everolimus)	For the prevention of solid organ transplant rejection in combination with Neoral® (cyclosporine)	Inhibits T-cell proliferation, which are cells involved in the rejection process/ Immunosuppressant (mammalian target of rapamycin inhibitor)	Oral	NDA filed December 2002. First approvable letter October 2003. Second approvable letter August 2004. FDA Advisory Committee recommended that additional study data be provided to support the NDA November 2005. Clinical trials are ongoing.

## New Dosage Forms in the Pipeline

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Current Route of Administration	Investigational Route of Administration*	Comments
<b>Cystic Fibrosis</b>					
Gilead Sciences/ Cayston™ (aztreonam lysine)	For the treatment of patients with cystic fibrosis 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. Available through an expanded access program.
<b>Multiple Sclerosis</b>					
Merck Serono and Teva/ Mylinax® (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	FDA granted fast track status. Full enrollment for phase III study completed January 2007. Expected study completion November 2008.

\*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
<b>Crohn's Disease</b>					
Bayer HealthCare Pharmaceuticals/ Leukine® (sargramostim)	To improve immune cell function in patients receiving treatment for myelogenous leukemia or following a bone marrow transplant	For the treatment of moderately to severely active Crohn's disease	Modulates immune system/Granulocyte macrophage colony stimulating factor	SC injection	
Elan and Biogen Idec/ Tysabri® (natalizumab)	For the treatment of relapsing forms of MS	For the treatment of moderately to severely active Crohn's disease	Reduces the presence of white blood cells, which are involved in the inflammation process/Monoclonal antibody	IV infusion	sBLA filed December 2006. The FDA extended the review period by up to three months October 2007. A response to the sBLA is expected January 2008.
<b>Hepatitis</b>					
Gilead Sciences/ Viread® (tenofovir)	For the treatment of HIV	For the treatment of chronic hepatitis B virus infection	Inhibits the formation of viral DNA/ Nucleotide reverse transcriptase inhibitor	Oral	sNDA filed October 2007.

## New Indications in the Pipeline (continued)

Manufacturer/ Drug Name	Current Indication	Investigational Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Hepatitis</b>					
Valeant Pharmaceuticals/ Infergen® (interferon alfacon-1)	For the treatment of hepatitis C virus (HCV) infection	For the treatment of chronic HCV in combination with ribavirin after failure to respond to previous course of pegylated interferon plus ribavirin	Inhibits viral replication/Interferon	SC injection	Clinical trials are ongoing.
<b>Juvenile Rheumatoid Arthritis</b>					
Abbott/ Humira® (adalimumab)	For the treatment of rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, and Crohn's disease	For the treatment of juvenile rheumatoid arthritis	Targets TNF alpha, which is involved in the inflammation process/ Anti-TNF inhibitor	SC injection	sBLA filed May 2007.
Amgen/ Kineret® (anakinra)	For the treatment of rheumatoid arthritis	For the treatment of polyarticular-course chronic juvenile rheumatoid arthritis	Blocks the biologic activity of IL-1/IL-1 inhibitor	SC injection	Clinical trials are ongoing.
Bristol-Myers Squibb/ Orencia® (abatacept)	For the treatment of moderate to severe rheumatoid arthritis in patients who have had an inadequate response to one or more disease- modifying anti- rheumatic drugs (DMARDs)	For the treatment of juvenile idiopathic arthritis in patients who have had an inadequate response to one or more DMARDs	Inhibits T-cell activation/ Selective costimulation modulator	IV infusion	sBLA accepted August 2007.
<b>Oncology</b>					
Pfizer/ Sutent® (sunitinib)	For the treatment of gastrointestinal stromal tumor and advanced renal cell carcinoma	For the treatment of metastatic colorectal cancer	Reduces tumor cell growth and blood supply/Multikinase inhibitor	Oral	Phase III trial initiated June 2007.
<b>Psoriasis</b>					
Abbott/ Humira® (adalimumab)	For the treatment of rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, and Crohn's disease	For the treatment of chronic plaque psoriasis	Targets TNF alpha, which is involved in the inflammation process/ Anti-TNF inhibitor	SC injection	sBLA filed April 2007.

**Approvable designation or letter** – indicates that an FDA committee has reviewed the application and has suggested to the FDA that it approve the new medication. The FDA does not have to follow the advice of the committee, but usually does.

**BLA** – stands for “Biologic License Application”; similar to an NDA, but used for investigational medications that are considered to be biologic agents.

**Double-blind** – 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 disease 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; usually applies to medications that treat serious or life-threatening conditions and that demonstrate the potential to address unmet medical needs.

**Follow-on protein product** – generally refers to protein products that are intended to be similar enough to a product already on the market to permit the applicant to rely on certain existing scientific knowledge about the safety and effectiveness of the approved protein product for approval of the follow-on protein product.

**Formal dispute resolution** – an FDA process where sponsors can challenge regulatory decisions by bringing the dispute to the attention of FDA supervisors.

**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.

**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.

**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.

**Phase IIIb** – trials that often begin before FDA approval. This phase—conducted after phase III trials—may supplement or complete earlier studies by providing additional safety data or they may test the approved medication for additional indications.

**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.

**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.

**sBLA** – stands for “Supplemental Biologic 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.

## References

Manufacturers' web sites

American Cancer Society  
[www.cancer.org](http://www.cancer.org)

BioPharm Insight  
[www.biopharminsight.com](http://www.biopharminsight.com)

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\*Information in the report is current as of November 2007, and was accessed on November 21, 2007.

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