

# Specialty Pharmacy Pipeline Report

Second 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.

### Soliris™ (eculizumab) – Now Approved

Soliris™, a monoclonal antibody manufactured by Alexion Pharmaceuticals, was approved by the FDA on March 16, 2007. It is the first medication available for the treatment of paroxysmal nocturnal hemoglobinuria (PNH). PNH is a rare, inherited blood disorder characterized by the destruction of red blood cells. Patients with PNH lack a specific protein on their red blood cells that normally protects these cells from destruction by the complement system—part of the body's immune system.

The management of PNH has historically been with supportive care, which includes blood transfusions and the treatment of blood clots, if they occur. Treatment with Soliris involves five initial weekly intravenous (IV) infusions, followed by maintenance IV infusions every two weeks. In one double-blind, placebo-

controlled clinical trial, Soliris was shown to stabilize hemoglobin levels and decrease the need for blood transfusions. The most common side effects reported in the Soliris group were headache, runny nose, sore throat, back pain, and nausea. Since Soliris affects the immune system, all patients must receive a meningococcal vaccine prior to treatment.

### Thelin™ (sitaxsentan) and Ambrisentan

Thelin™ and ambrisentan are new medications being studied for the treatment of pulmonary arterial hypertension (PAH). PAH is characterized by high blood pressure in the arteries of the lung, which can lead to heart failure and premature death. Although the exact number is unknown, PAH is thought to affect approximately 200,000 patients worldwide. Management of PAH varies depending on the severity of the disease and the patient's response to treatment.

Thelin and ambrisentan are both members of the endothelin receptor antagonist (ERA) medication class. ERAs treat PAH by blocking the effects of endothelin, a substance made by the body that can sometimes lead to the development of PAH. Currently, Tracleer® (bosentan), manufactured by Actelion Pharmaceuticals, is the only approved ERA in the United States. Tracleer is known as a dual ERA since it blocks endothelin from binding to both type A endothelin receptors (ET<sub>A</sub>) and type B endothelin receptors (ET<sub>B</sub>) almost equally. Thelin and ambrisentan are considered selective ERAs because they bind preferentially to ET<sub>A</sub> receptors.

Thelin, developed by Encysive Pharmaceuticals, is a highly selective ERA that is 6,500-fold more selective for ET<sub>A</sub> versus ET<sub>B</sub>. A new drug application (NDA) for

Thelin was originally submitted in May 2005. Since that time, Encysive has received and responded to two approvable letters from the FDA. Encysive expects the next response from the FDA (to approve or not approve Thelin) by June 15, 2007.

Ambrisentan, manufactured by Gilead Sciences, is a moderately selective ERA that is 260-fold more selective for ET<sub>A</sub> versus ET<sub>B</sub>. The NDA for ambrisentan was filed in December 2006. In February 2007, the FDA granted priority review status to the application. Gilead expects a response to its NDA by June 18, 2007.

There are no head-to-head studies comparing the safety and efficacy of Tracleer, Thelin, and ambrisentan. Due to this lack of direct comparisons, it is not known if the new selective ERAs will offer any advantage over Tracleer. All of the ERAs are designated as orphan drugs and administered by mouth. Tracleer is dosed twice daily, while Thelin and ambrisentan are dosed once daily.

### Satraplatin

Satraplatin is an investigational platinum chemotherapy agent being studied in combination with prednisone for the treatment of hormone-refractory prostate cancer (HRPC) in patients whose prior chemotherapy has failed. In contrast to the currently approved platinum medications, which are all given intravenously, satraplatin is being manufactured as a capsule.

Besides skin cancer, prostate cancer is the most common type of cancer diagnosed in men. The American Cancer Society estimates that in 2007, there will be nearly 219,000 new cases of prostate cancer diagnosed in American men. Most patients are initially treated with surgery, radiation, or hormone suppression therapy. Eventually, almost all prostate cancers will become resistant to hormone therapy (hormone-refractory) if treated long enough. Until recently, treatment of HRPC with chemotherapy improved symptoms but did not increase survival. In 2004, however, Taxotere<sup>®</sup> (docetaxel) became the first medication approved for the treatment of advanced HRPC that showed a survival benefit. Today, Taxotere in combination with prednisone is still the treatment of choice in these patients.

Satraplatin, in combination with prednisone, has been shown to prolong progression-free survival (the length of time between a patient starting treatment in a clinical trial until tumor growth or death) in patients with HRPC who have failed Taxotere or other chemotherapies. The median time to progression in the phase III registration trial was 11.1 weeks in the satraplatin group, versus 9.7 weeks in the placebo group. The overall survival data for this study are expected by the end of the year. GPC Biotech and Spectrum Pharmaceuticals completed the submission of an NDA for satraplatin on February 15, 2007. The FDA granted a priority review status to the NDA and a response is expected by August 15, 2007. Satraplatin is currently available to eligible patients through an expanded access program.

## Medications Recently Approved

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Approval Date	Comments
<b>Central Precocious Puberty</b>					
Indevis Pharmaceuticals/ Supprelin®-LA (histrelin acetate)	For the treatment of central precocious puberty	Prevents hormone secretion/Luteinizing hormone-releasing hormone agonist	SC implant	05/03/07	Indevis also markets this product under the name of Vantas® for the palliative treatment of advanced prostate cancer.
<b>Crohn's Disease</b>					
*Abbott/ Humira® (adalimumab)	For the treatment of moderately to severely active Crohn's disease	Targets tumor necrosis factor alpha, which is involved in the inflammation process/ Monoclonal antibody	SC injection	02/27/07	Previously approved for the treatment of rheumatoid arthritis, psoriatic arthritis, and ankylosing spondylitis.
<b>Growth Hormone</b>					
LG Life Sciences/ Valtropin® (somatropin [rDNA origin])	For the treatment of pediatric patients who have growth failure due to an inadequate secretion of growth hormone or associated with Turner syndrome. For the replacement of growth hormone in adults with growth hormone deficiency.	Replaces growth hormone/Recombinant human growth hormone	SC injection	04/19/07	Second growth hormone to be approved as a follow-on protein product.
<b>Oncology</b>					
GlaxoSmithKline/ Tykerb® (lapatinib)	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)	Inhibits the tyrosine kinase components of EGFR and HER2 receptors/Dual kinase inhibitor	Oral	03/13/07	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.
<b>Parkinson's Disease</b>					
UCB and Schwarz Pharma/Neupro® (rotigotine)	For the treatment of the signs and symptoms of early-stage idiopathic Parkinson's disease	Increases level of dopamine/Dopamine receptor agonist	Transdermal	05/10/07	Also in phase III trials for the treatment of advanced-stage Parkinson's disease.
<b>Paroxysmal Nocturnal Hemoglobinuria</b>					
Alexion Pharmaceuticals/ Soliris™ (eculizumab)	For the treatment of patients with paroxysmal nocturnal hemoglobinuria (PNH)	Prevents the final stages of complement activation, thereby reducing red blood cell destruction/ Complement inhibitor	IV infusion	03/16/07	First treatment approved for PNH. Designated as an orphan drug.

\*New indication for an already approved medication.

## Pipeline Medications in Phase III Trials

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Acromegaly</b>				
Tercica and Ipsen/ Somatuline <sup>®</sup> Autogel <sup>®</sup> (lanreotide)	For the treatment of acromegaly	Binds to somatostatin receptors leading to a decrease in growth hormone levels/ Somatostatin analogue	SC injection	Designated as an orphan drug. NDA accepted January 2007. A response is expected by August 30, 2007.
<b>Amyloid A Amyloidosis</b>				
Neurochem/ Kiacta <sup>™</sup> (eprodysate), formerly Fibrillex <sup>™</sup>	For the treatment of Amyloid A amyloidosis	Reduces amyloid protein deposition/ Amyloid fibrillogenesis inhibitor	Oral	NDA filed February 2006. FDA granted priority review status April 2006. Approvable letter August 2006. FDA accepted complete response to approvable letter November 2006. Amendment to the NDA submitted February 2007. FDA granted a three-month extension to the review period April 2007. A response is expected by July 16, 2007.
<b>Anemia</b>				
Advanced Magnetics/ Ferumoxytol	For the treatment of anemia due to chronic kidney disease	Iron replacement	IV injection	NDA filing now planned for the fourth calendar quarter of 2007.
Icegen and McNeil/ Senicapoc, formerly ICA-17043	For chronic preventive treatment of sickle cell disease	Prevents red blood cell dehydration and formation of sickle cells/Gardos ion channel blocker	Oral	Phase III trial terminated due to the low probability of achieving the primary endpoint. Once the final data are available, future development options may be considered.
Roche/ Mircera <sup>®</sup> (erythropoietin), formerly CERA, R744	For the treatment of anemia associated with chronic kidney disease, including patients on dialysis	Stimulates red blood cell production/ CERA (continuous erythropoietin receptor activator)	SC or IV injection	BLA filed April 2006. FDA accepted additional data and granted a three-month extension to the review period in December 2006. A response is expected in May 2007.
Inspire Pharmaceuticals/ Denufosal	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. Complete enrollment expected by the end of 2007.
<b>Hemophilia</b>				
Wyeth/ ReFacto <sup>®</sup> AF (antihemophilic factor)	For the treatment of hemophilia	Blood clotting factor/ Recombinant factor VIII	Infusion	Launch anticipated in 2008. Prodrug of ribavirin.

## 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)	A For the treatment of chronic hepatitis C virus infection in combination with pegylated interferon alfa-2b	Reduces virus synthesis/Antiviral (synthetic nucleoside analogue)	Oral	Enrollment for a phase II trial using a weight-based dose of Viramidine initiated in 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>				
Merck/ Isentress™ (raltegravir), formerly MK-0518	For the treatment of HIV	Inhibits the insertion of the HIV viral DNA into human DNA/ Integrase inhibitor	Oral	Available through an expanded access program.
Pfizer/ Maraviroc	For the treatment of HIV	Inhibits entry of virus into human CD4 T-cells/Cellular chemokine receptor antagonist (CCR-5)	Oral	NDA filed December 2006. FDA granted priority review status February 2007. FDA Advisory Committee recommended approval April 2007. Available through an expanded access program.
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 filing planned for 2007. FDA granted fast track status. Available through an expanded access program.
<b>Inflammatory Disease</b>				
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 tumor necrosis factor alpha, which is involved in the inflammatory process/ Monoclonal antibody	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 by the end of 2007.
<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	If approved, would be first oral agent available to treat MS. NDA filing planned for 2009. Also in phase III trials for the prevention of kidney transplant rejection.

## Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Oncology</b>				
Adventrx/ CoFactor <sup>®</sup> (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	Enhances 5-FU therapy. Phase III trials initiated June 2006.
Cell Therapeutics/ Xyotax <sup>™</sup> (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. Filed for a Special Protocol Assessment (SPA) January 2007. FDA granted fast track status.
Dendreon/ Provenge <sup>®</sup> (sipuleucel-T)	For the treatment of metastatic, HRPC	Stimulates immune system to target and destroy cancer cells/Active cellular immunotherapy	IV infusion	BLA filed November 2006. FDA granted priority review status January 2007. FDA Advisory Committee recommended approval March 2007. Approvable letter May 2007– the FDA requested additional data.
GPC Biotech & Spectrum Pharmaceuticals/ (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. FDA granted priority review status April 2007. A response is expected by August 15, 2007. Available through an expanded access program.
Intarcia Therapeutics/ Atamestane	For first-line treatment of hormone-dependent breast cancer in combination with estrogen receptor blocker Fareston <sup>®</sup> (toremifene)	Interferes with estradiol production/Steroidal aromatase inhibitor	Oral	Phase III studies ongoing.
Lorus Therapeutics/ Virulizin <sup>®</sup>	For first-line treatment of advanced pancreatic cancer in combination with Gemzar <sup>®</sup> (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 <sup>™</sup> (glutamine in UpTec <sup>™</sup> )	For the prevention and treatment of chemotherapy-induced oral mucositis	Promotes healing and prevents damage to mucosa/Amino acid	Oral	FDA granted priority review status. NDA filed April 2006. Approvable letter October 2006. The FDA requested an additional phase III efficacy trial.

## Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Oncology</b>				
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.
Novartis/ Tasigna® (nilotinib)	For the treatment of Philadelphia chromosome-positive (Ph+) chronic myeloid leukemia (CML) in patients who do not respond or become resistant to Gleevec® (imatinib)	Inhibits Bcr-Abl, the definitive cause of Ph+ CML/Tyrosine kinase inhibitor	Oral	NDA filed December 2006. Designated as an orphan drug with fast track status. Available through an expanded access program.
Novartis and Schering AG/ Vatalanib	For the treatment of metastatic colorectal cancer in combination with oxaliplatin, 5-fluorouracil, and leucovorin	Inhibits formation of blood vessels that supply nutrients to tumors/VEGFR tyrosine kinase inhibitor	Oral	NDA filing planned for 2007.
Protherics/ Voraxaze™ (glucarpidase), formerly Carboxypeptidase G2	Adjunctive therapy for cancer patients undergoing chemotherapy who are at risk of methotrexate toxicity	Rapidly reduces serum methotrexate levels/Recombinant enzyme	IV injection	BLA filed September 2006. BLA resubmitted November 2006. Designated as an orphan drug with fast track status. Available on a compassionate use basis—one type of an expanded access program—from the distributor.
SRI International/ Tirazone® (tirapazamine)	For the treatment of cervical cancer and non-small cell lung cancer	Selective toxicity against cells with low oxygen/Antineoplastic	IV injection	Development of Tirazone for the treatment of head and neck cancer has been discontinued for undisclosed reasons.
Threshold Pharmaceuticals/ Glufosfamide	For second-line treatment of metastatic pancreatic cancer	Decreases tumor size/Modified alkylating agent	IV infusion	Designated as an orphan drug with fast track status. Phase III trial did not meet its primary endpoint. Phase II trials for the treatment of metastatic pancreatic cancer and other advanced-stage cancers are ongoing.
Wyeth Pharmaceuticals/ Torisel™ (temsirolimus)	For the treatment of renal cell carcinoma (RCC) and mantle cell lymphoma	Controls tumor cell growth/Cell cycle inhibitor	Oral/IV injection	Designated as an orphan drug. NDA for RCC filed October 2006. FDA granted priority review status December 2006. FDA accepted additional data and granted a three-month extension to the review period in April 2007. A response is expected by July 2007.

## Pipeline Medications in Phase III Trials (continued)

Manufacturer/ Drug Name	Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Osteoporosis</b>				
Amgen/ Denosumab	For the treatment of postmenopausal osteoporosis and treatment-induced bone loss	Inhibits bone destruction/ Monoclonal antibody	SC injection	
NPS Pharmaceuticals/ Preos <sup>®</sup> (parathyroid hormone)	For the treatment of osteoporosis in postmenopausal women	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 in March 2007.
<b>Phenylketonuria</b>				
BioMarin and Merck Serono/ Kuvan <sup>™</sup> (sapropterin), formerly Phenoptin <sup>™</sup>	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 filing planned for the second quarter of 2007.
<b>Pulmonary Arterial Hypertension</b>				
Encysive Pharmaceuticals/ Theelin <sup>™</sup> (sitaxsentan)	For the treatment of pulmonary arterial hypertension (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. FDA accepted complete response to approvable letter December 2006. A response is expected by June 15, 2007.
Gilead Sciences/ Ambrisentan	For the treatment of PAH	Reduces vascular smooth muscle constriction/Endothelin receptor antagonist	Oral	Designated as an orphan drug. NDA filed December 2006. FDA granted priority review status February 2007. A response is expected by June 18, 2007.
<b>Respiratory Syncytial Virus</b>				
Astra Zeneca and MedImmune/ Numax <sup>®</sup> (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 <sup>®</sup> (palivizumab), which is the current standard of care for the prevention of RSV. BLA filing planned during the second half of 2007. Pending approval, launch anticipated during the 2008-2009 RSV season.
<b>Rheumatoid Arthritis</b>				
Roche and Chugai/Actemra <sup>™</sup> (tocilizumab)	For the treatment of rheumatoid arthritis	Blocks interleukin-6 receptors/Monoclonal antibody	IV infusion	BLA filing planned 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 expected early 2009. FDA granted fast track status.
Novartis/ Certican <sup>™</sup> (everolimus)	For the prevention of solid organ transplant rejection in combination with Neoral <sup>®</sup> (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 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	NDA filing planned for the second half of 2007. Designated as an orphan drug.
<b>Multiple Sclerosis</b>					
Merck Serono and IVAX Corporation/ 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.
<b>Oncology</b>					
GlaxoSmithKline/ Hycamtin® (topotecan)	For the second-line treatment of small-cell lung cancer	Damages the DNA of cancer cells resulting in cancer cell death/ Topoisomerase I inhibitor	IV infusion	Oral	NDA filing planned for 2007.

## 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>					
Elan and Biogen Idec/Tysabri® (natalizumab)	For the treatment of relapsing forms of MS	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.
Bayer HealthCare Pharmaceuticals/ Leukine® (sargramostim)	To improve immune cell function in patients receiving treatment for myelogenous leukemia or following a bone marrow transplant	Moderately to severely active Crohn's disease	Modulates immune system/Granulocyte macrophage colony stimulating factor	SC injection	
<b>Hepatitis</b>					
Gilead Sciences/ Viread® (tenofovir)	For the treatment of HIV	Treatment of chronic hepatitis B virus infection	Inhibits the formation of viral DNA/ Nucleotide reverse transcriptase inhibitor	Oral	
Valeant Pharmaceuticals/ Infergen® (interferon alfacon-1)	For the treatment of hepatitis C virus (HCV) infection	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	

## New Indications in the Pipeline (continued)

Manufacturer/ Drug Name	Current Indication	Investigational Indication	Mechanism of Action/Drug Class	Route of Administration	Comments
<b>Juvenile Rheumatoid Arthritis</b>					
Abbott/ Humira® (adalimumab)	For the treatment of rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, and Crohn's disease	Treatment of juvenile rheumatoid arthritis	Targets tumor necrosis factor alpha/ Monoclonal antibody	SC injection	sBLA filed May 2007.
Amgen/ Kineret® (anakinra)	For the treatment of rheumatoid arthritis	Treatment of polyarticular-course chronic juvenile rheumatoid arthritis	Blocks the biologic activity of interleukin-1 (IL-1)/IL-1 inhibitor	SC injection	
<b>Oncology</b>					
Bayer Pharmaceuticals and Onyx Pharmaceuticals/ Nexavar® (sorafenib)	For the treatment of advanced renal cell carcinoma	Treatment of advanced liver cancer	Reduces tumor cell growth and blood supply/Multikinase inhibitor	Oral	Designated as an orphan drug for this indication. FDA granted fast track status.
<b>Psoriasis</b>					
Abbott/ Humira® (adalimumab)	For the treatment of rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, and Crohn's disease	Treatment of chronic plaque psoriasis	Targets tumor necrosis factor alpha/ Monoclonal antibody	SC injection	sBLA filed April 2007.

**Approvable designation or letter** – indicates that an FDA committee has reviewed the NDA 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 approved to permit the applicant to rely on certain existing scientific knowledge about the safety and effectiveness of the approved protein product for approval.

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

**NDA 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 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 get a new indication approved 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 May 2007, and was accessed May 10, 2007.

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