NEW DRUG APPROVALS

Epclusa for Chronic HCV Infection

The FDA has approved Epclusa (sofosbuvir/velpatasvir, Gilead Sciences) for the treatment of adults with chronic hepatitis C virus (HCV) infection with or without cirrhosis. For patients with decompensated (moderate-to-severe) cirrhosis, Epclusa is approved for use in combination with ribavirin. Epclusa is a fixed-dose combination tablet containing sofosbuvir (Sovaldi), a drug approved in 2013, and velpatasvir, a new drug, and it is the first to treat all six major forms of HCV.

The safety and efficacy of Epclusa were evaluated in three 12-week, phase 3 trials involving 1,558 patietns with HCV infection and cirrhosis or compensated cirrhosis (mild cirrhosis). The results showed that 95% to 99% of patients who received Epclusa had no virus detected in the blood 12 weeks after finishing treatment, suggesting that the patients' infections had been cured.

Source: FDA, June 28, 2016

Liquid Cannabinoid Syndros

An orally administered liquid formulation of the cannabinoid drug dronabinol (Syndros, Insys Therapeutics), a pharmaceutical version of tetrahydrocannabinol, has been approved by the FDA. Liquid dronabinol is indicated for use in treating anorexia associated with weight loss in patients with acquired immune deficiency syndrome. It is also indicated in treating nausea and vomiting associated with cancer chemotherapy in patients who have failed to respond adequately to conventional antiemetic treatments.

Source: Insys Therapeutics, July 5, 2016

Rayaldee for Hyperparathyroidism

Rayaldee (calcifediol extended-release capsules, Opko Health) has secured FDA approval for the treatment of secondary hyperparathyroidism in adults with stage-3 or stage-4 chronic kidney disease (CKD) and serum total 25-hydroxyvitamin D levels of less than 30 ng/mL. Rayaldee is a patented extended-release product containing 30 mcg of the prohormone calcifediol (25-hydroxyvitamin D_3).

Rayaldee was designed to raise serum total 25-hydroxyvitamin D (prohormone) concentrations to targeted levels (at least 30 ng/mL) and to reduce elevated plasma-intact parathyroid hormone levels. It is not indicated for patients with stage-5 CKD or end-stage renal disease on dialysis.

Source: Opko Health, June 21, 2016

VaxChora Oral Cholera Vaccine

The FDA has granted marketing approval for Vaxchora (PaxVax Corp.), a single-dose, oral, live attenuated cholera vaccine indicated for use in adults 18 to 64 years of age. It is the only vaccine available in the United States for cholera and the only single-dose vaccine for cholera licensed anywhere in the world. The product is expected to be commercially available in the U.S. in the third quarter of 2016.

The attenuated cholera strain used in the vaccine is CVD 103-HgR, which was licensed from the Center for Vaccine Development at the University of Maryland School of Medicine in 2010. Vaxchora is indicated for active immunization against disease caused by *Vibrio cholerae* serogroup O1 in adults traveling to cholera-affected areas. Vaxchora has not been shown to protect against disease caused by *V. cholerae* serogroup O139 or other non-O1 serogroups.

Source: PaxVax, June 10, 2016

Generic Approvals

Fenofibrate Tablets

Mylan Pharmaceuticals, Inc., has received FDA approval to market 40-mg and 120-mg tablets of fenofibrate, the first generic version of Fenoglide (Santarus). Fenoglide is indicated as adjunctive therapy to diet to reduce elevated low-density lipoprotein-cholesterol, total cholesterol, triglycerides, and apolipoprotein B to increase high-density lipoprotein in adults with primary hypercholesterolemia or mixed dyslipidemia.

Sources: Mylan N.V., July 6, 2016, and FDA, June 23, 2016

Tobramycin Sulfate Injection

The FDA has granted approval to Claris Lifesciences to market generic tobramycin sulfate injection in 80 mg/2 mL and 1,200 mg/30 mL multiple-dose vials for the treatment of patients with bacterial infections. The product is currently on the FDA's shortage list.

Source: Claris Lifesciences, July 5, 2016

Acetaminophen Injection

The FDA has approved Perrigo Company's generic version of Ofirmev (acetaminophen) injection 1,000 mg/100 mL (Mallinckrodt Pharmaceuticals). Perrigo can launch the product on December 6, 2020, or earlier under certain circumstances. The company has also secured the right to be the sole authorized generic distributor should Mallinckrodt elect to launch an authorized generic product. Ofirmev injection 1,000 mg/100 mL is indicated for the management of mild-to-moderate pain, the management of moderate-to-severe pain with adjunctive opioid analgesics, and the reduction of fever.

Source: Perrigo Company, June 16, 2016

Ethacrynic Acid Tablets

The FDA has approved the marketing of ethacrynic acid tablets USP, 25 mg (Edenbridge Pharmaceuticals), a therapeutic equivalent to 25-mg tablets of Edecrin (Aton Pharma Inc.). This is the first generic version of Edecrin, a loop diuretic indicated for the treatment of edema when an agent with greater diuretic potential than those commonly employed is required.

Sources: FDA and Edenbridge Pharmaceuticals, June 30, 2016

NEW INDICATIONS

Humira for Uveitis/Panuveitis

The FDA has approved adalimumab (Humira, AbbVie) for the treatment of noninfectious intermediate and posterior uveitis and panuveitis, making it the only FDA-approved noncorticosteroid therapy available for adults with this indication. This is the 10th approved indication for adalimumab in the United States for immune-mediated diseases. Adalimumab targets and helps block tumor necrosis factor-alpha, a source of inflammation that can have a role in uveitis.

Source: AbbVie, June 30, 2016

Qudexy XR to Prevent Migraine

The FDA has expanded the labeling for topiramate extended-release capsules (Qudexy XR, Upsher-Smith Laboratories) to include prophylaxis of migraine headache in adults. Topiramate is a sulfamate-substituted monosaccharide.

Quexy XR is the first extended-release topiramate formulation approved for migraine prophylaxis in the United States. It has been available in the U.S. since June 2014 as initial monotherapy in patients 2 years of age and older with partial-onset or primary generalized tonic-clonic seizures and for adjunctive therapy in patients 2 years of age or older with partial-onset or primary generalized tonic-clonic seizures, or seizures associated with Lennox–Gastaut syndrome.

Source: Upsher-Smith Laboratories, June 9, 2016

FDA REVIEW ACTIVITIES

Priority Review Status

Ocrevus for Multiple Sclerosis

The FDA has accepted for review a biologics license application for ocrelizumab (Ocrevus, Genentech) for the treatment of patients with relapsing multiple sclerosis (MS) or primary progressive MS. The agency has granted the application a priority review designation, with a targeted action date of December 28, 2016. If approved, ocrelizumab would be the first treatment indicated for both forms of MS, which affect approximately 95% of MS patients at diagnosis.

Ocrelizumab is an investigational, humanized monoclonal antibody designed to selectively target CD20-positive B cells, a specific type of immune cell thought to be a key contributor to myelin (nerve cell insulation and support) and axonal (nerve cell) damage. This nerve cell damage can lead to disability in people with MS. Based on preclinical studies, ocrelizumab binds to CD20 cell-surface proteins expressed on certain B cells, but not on stem cells or plasma cells.

Source: Genentech, June 27, 2016

AC-170 for Allergic Conjunctivitis

The FDA has accepted the new drug application for AC-170 (Nicox S.A.), a proprietary cetirizine eye-drop formulation, for the treatment of ocular itching associated with allergic conjunctivitis. The agency also granted a priority review designation and assigned a Prescription Drug User Fee Act goal date of October 18, 2016.

AC-170 is a new formulation of cetirizine, the active ingredient in Zyrtec (Johnson & Johnson), which has been developed for topical application in the eye. Cetirizine is a second-generation antihistamine and mast-cell stabilizer that binds competitively to histamine receptor sites to reduce swelling, itching, and vasodilation. Cetirizine, as an approved oral drug, has a well-characterized systemic safety and efficacy profile.

Source: Nicox, June 21, 2016

Fast-Track Designations

Seribantumab for Lung Cancer

The FDA has granted seribantumab (Merrimack Pharmaceuticals) fast-track status for development in patients with heregulin-positive, locally advanced or metastatic non–small-cell lung cancer (NSCLC) whose disease has progressed after immunotherapy. The global SHERLOC trial is evaluating seribantumab in combination with docetaxel or pemetrexed in heregulin-positive patients with NSCLC. The data from this study will be used to support a biologics license application to the FDA.

Seribantumab is a fully human anti-ErbB3 monoclonal antibody that targets phenotypically distinct heregulin-positive cancer cells within solid tumors. Heregulin-positive cancer cells are characterized by their ability to escape the effects of targeted cytotoxic and antiendocrine therapies and to potentially contribute to rapid clinical progression in patients whose tumor cells test positive for heregulin.

Source: Merrimack Pharmaceuticals, July 5, 2016

TK216 for Ewing Sarcoma

The *ets*-family inhibitor TK216 (Oncternal Therapeutics) has received a fast-track designation from the FDA for the treatment of patients with Ewing sarcoma who have relapsed or are refractory to standard-of-care therapy. Oncternal is initiating a phase 1 trial in subjects with relapsed or refractory Ewing sarcoma.

TK216 is a first-in-class small molecule that inhibits the biological activity of *ets*-family transcription factor oncoproteins in a variety of tumor types, thereby stopping cancer cell growth and tumor formation. In Ewing sarcoma, the compound is designed to target a single and well-characterized genetic mutation that causes the disease.

Source: Oncternal Therapeutics, June 20, 2016

Cirara for Hemispheric Infarctions

The FDA has granted fast-track status to an investigational, reformulated intravenous version of the diabetes drug glyburide (Cirara, Remedy Pharmaceuticals)

for the treatment of patients with large hemispheric infarctions. A phase 3 trial is expected to begin by the end of 2016.

Cirara is a patented, high-affinity inhibitor of Sur1-Trpm4 channels, which are upregulated after ischemia and trauma. The opening of these channels can lead to edema, midline shift, increased intracranial pressure, and brain herniation, culminating in permanent disability or death.

Source: Remedy Pharmaceuticals, June 8, 2016

Breakthrough Therapy Status

Imbruvica for Chronic GVHD

The FDA has granted a fourth breakthrough therapy designation for ibrutinib (Imbruvica, Janssen) as monotherapy for the treatment of patients with chronic graft-versus-host disease (cGVHD) after the failure of one or more lines of systemic therapy. The agency also granted the medication an orphan drug designation for cGVHD. This is the first time ibrutinib has been granted both breakthrough status and orphan drug status for an indication beyond hematologic malignancies.

Ibrutinib works by blocking a specific protein called Bruton's tyrosine kinase (BTK). BTK proteins transmit signals that tell B cells to mature and produce antibodies, and the proteins are needed by specific cancer cells to multiply and spread. Ibrutinib targets and blocks BTK, inhibiting cancer-cell survival and spread.

Source: Janssen, June 29, 2016

Jakafi for Acute GVHD

The FDA has granted breakthrough therapy status to ruxolitinib (Jakafi, Incyte Corporation) for the treatment of patients with acute graft-versus-host disease (GVHD). There are currently no approved treatments for patients with acute GVHD.

Ruxolitinib is a first-in-class Janus kinase 1 (JAK1)/JAK2 inhibitor approved by the FDA for the treatment of patients with polycythemia vera (PV) who have had an inadequate response to or are intolerant of hydroxyurea. Ruxolitinib is also indicated for the treatment of patients with intermediate- or high-risk myelofibrosis (MF), including primary MF, post-PV MF, and post–essential thrombocythemia MF.

Recently, in the phase 3 RESPONSE-2 trial, ruxolitinib was shown to be superior to best available therapy (BAT) in maintaining hematocrit control (62.2% versus 18.7%, respectively; $P < 0.0001$) over 28 weeks without the need for phlebotomy in patients with inadequately controlled PV resistant to or intolerant of hydroxyurea who did not have an enlarged spleen. Nearly five times more patients with PV achieved complete hematologic remission with ruxolitinib compared with BAT (23.0% versus 5.3%, respectively, $P = 0.0019$).

Sources: Incyte Corporation, June 10 and 23, 2016

SHP621, SHP625 for GI Ailments

The FDA has granted breakthrough therapy designations for two investigational products for rare diseases: SHP621 (budesonide oral suspension) for eosinophilic esophagitis (EoE) and SHP625 (maralixibat) for progressive familial intrahepatic cholestasis type 2 (PFIC2). Both treatments are being developed by Shire.

SHP621 is a topically active, oral viscous formulation of budesonide formulated specifically for the treatment of patients with EoE—a serious, chronic, and rare disease that stems from an elevated number of eosinophils that infiltrate the walls of the esophagus. SHP625 is a selective inhibitor of the apical sodium-dependent bile acid transporter. It is being evaluated in several rare cholestatic liver diseases, including PFIC2, in both pediatric and adult populations. PFIC refers to a group of autosomal-recessive liver disorders of childhood that disrupt bile formation and present with cholestasis.

Source: Shire, June 13, 2016

Complete Response Letters

LPCN 1021 for Hypogonadism

Lipocine, Inc., has received a complete response letter (CRL) from the FDA regarding its new drug application for LPCN 1021, an oral testosterone product candidate for twice-a-day testosterone replacement therapy in adult males for conditions associated with a deficiency or absence of endogenous testosterone (hypogonadism). The CRL identified deficiencies related to the dosing algorithm for the LPCN 1021 label: The proposed titration scheme for clinical practice was significantly different from the titration scheme used in the phase 3 trial, leading to discordance in titration decisions between the phase 3 trial and real-world clinical practice. The company will work with the FDA to address the issue.

Source: Lipocine, June 29, 2016

Abuse-Deterrent Apadaz for Pain

The FDA has issued a complete response letter regarding the new drug application (NDA) for Apadaz (benzhydrocodone and acetaminophen, KemPharm, Inc.), an investigational abuse-deterrent product candidate for the short-term management of acute pain. Apadaz is an immediate-release fixed-dose combination product consisting of benzhydrocodone hydrochloride, a prodrug of hydrocodone and benzoic acid, and acetaminophen. KemPharm was seeking a proposed indication for the short-term management (no more than 14 days) of acute pain. The company submitted its NDA in December 2015.

Apadaz was developed to provide deterrence against nonoral routes of abuse. It was not designed to provide barriers against oral abuse, even though epidemiological data have shown that oral use is the most common route of abuse for hydrocodone immediate-release combination products. Currently, there are no marketed immediate-release

formulations of hydrocodone with abuse-deterrent properties.

Source: KemPharm, June 13, 2016

OTHER DRUG NEWS

Warnings Strengthened For Invokana and Farxiga

The FDA has strengthened the existing warning about the risk of acute kidney injury for the type-2 diabetes medications canagliflozin (Invokana, Invokamet, Janssen) and dapagliflozin (Farxiga, Xigduo XR, AstraZeneca). Based on recent reports, the agency revised the warnings on the drug labels to include information about acute kidney injury and added recommendations to minimize this risk.

Canagliflozin and dapagliflozin are prescription medications used with diet and exercise to help lower blood sugar in adults with type-2 diabetes. They belong to a class of drugs called sodium-glucose cotransporter-2 inhibitors. Canagliflozin and dapagliflozin lower blood sugar by causing the kidneys to remove sugar from the body through the urine.

From March 2013, when canagliflozin was approved, to October 2015, the FDA received reports of 101 confirmable cases of acute kidney injury, some requiring hospitalization and dialysis, with canagliflozin or dapagliflozin use.

Source: FDA, June 14, 2016

ACIP Rejects Use of FluMist

The Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP) has voted that live attenuated influenza vaccine (LAIV), also known as the "nasal spray" flu vaccine, should *not* be used during the 2016–2017 flu season. The ACIP's vote was based on data showing poor or relatively lower effectiveness of LAIV from 2013 through 2016. The committee continues to recommend annual flu vaccination with either the inactivated influenza vaccine (IIV) or the recombinant influenza vaccine (RIV) for everyone 6 months of age and older.

LAIV is sold in the United States as FluMist Quadrivalent (MedImmune). LAIV was initially licensed in 2003 as a trivalent (three-component) vaccine. LAIV is currently the only non–injection-based flu vaccine available on the U.S. market.

Source: CDC, June 22, 2016

CLINICAL TRIALS UPDATE

Vobarilizumab for RA

An investigational anti–interleukin-6 receptor (IL-6R) "nanobody," vobarilizumab (Ablynx/AbbVie), has successfully completed a 12-week phase 2b monotherapy study in patients with moderate-to-severe rheumatoid arthritis (RA) who were intolerant of methotrexate or for whom continued methotrexate treatment was inappropriate.

The disease remission rates were 26% for vobarilizumab 150 mg every four weeks, 27% for vobarilizumab 150 mg every two weeks (Q2W), and 41% for vobarilizumab 225 mg Q2W compared with 27% for tocilizumab (Actemra, Genentech/Roche) 162 mg once a week or Q2W.

Vobarilizumab (26kD) consists of an anti–IL-6R nanobody linked to an anti–human serum albumin nanobody to increase the half-life of the molecule.

Source: Ablynx, July 7, 2016

Pegfilgrastim Biosimilar

Cinfa Biotech has announced positive data from a clinical trial of B12019, a biosimilar of pegfilgrastim (Neulasta, Amgen) for the treatment of chemotherapy-induced neutropenia. The study's primary endpoints—the pharmacokinetic and pharmacodynamic equivalence of B12019 with the originator product—were met. The single-dose, randomized, double-blind, crossover study enrolled 172 healthy volunteers in Germany.

Source: Cinfa Biotech, July 4, 2016

SHP465 for ADHD

Positive results have been reported from a four-week, randomized, double-blind, parallel-group, placebo-controlled study of SHP465 (triple-bead mixed amphetamine salts, Shire) in 275 adults (18 to 55 years of age) with attention-deficit/hyperactivity disorder (ADHD). SHP465 is an investigational oral stimulant medication being evaluated in the U.S. as a potential treatment for ADHD.

The study's primary efficacy analysis showed that SHP465 12.5 mg and 37.5 mg, both administered as a daily morning dose, were superior to placebo with respect to the change from baseline on the clinically administered ADHD Rating Scale total score, with mean differences from placebo at week 4 of –8.1 ($P < 0.001$) for 12.5 mg and –13.3 ($P < 0.001$) for 37.5 mg. SHP465 12.5-mg and 37.5-mg doses were also significantly better than placebo on the key secondary efficacy analysis of the Clinical Global Impression–Improvement (CGI-I) scale at week 4, with scores of –0.8 ($P < 0.001$) for 12.5 mg and –1.2 ($P < 0.001$) for 37.5 mg, suggesting a marked clinical improvement in the patients' global functioning.

Source: Shire, June 29, 2016

Stivarga for Unresectable Liver Cancer

Phase 3 results have shown that regorafenib tablets (Stivarga, Bayer) achieved a median overall survival improvement in patients with unresectable hepatocellular carcinoma who progressed after treatment with sorafenib (Nexavar, Bayer). The study found that patients treated with regorafenib had a median overall survival of 10.6 months compared with 7.8 months for patients given placebo plus best supportive care (hazard ratio, 0.62; $P < 0.001$).

Regorafenib is indicated for the treatment of patients with metastatic colorectal cancer who have been treated previously

with fluoropyrimidine-, oxaliplatin-, and irinotecan-based chemotherapy, an anti–vascular endothelial growth factor (VEGF) therapy, and, if *RAS* wild type, an anti–epidermal growth factor receptor (EGFR) therapy. It is also indicated for the treatment of patients with locally advanced, unresectable, or metastatic gastrointestinal stromal tumors who have been treated previously with imatinib mesylate and sunitinib malate.

Source: Bayer, June 28, 2016

C-Cure Cell Therapy for CVD

Disappointing results were reported from the phase 3 CHART-1 trial, a European study of C-Cure cell therapy (Celyad) in patients with cardiovascular disease. The 39-week study did not reach its primary endpoint—a statistically significant difference between the treatment and control (sham procedure) arms. A significant difference ($P = 0.015$) was observed, however, in a subset of patients characterized by their end diastolic volume at enrollment.

C-Cure consists of a patient's own cells harvested from bone marrow, treated with a combination of cytokines and growth factors, and then reinjected into the heart. It is designed to enhance reparative capabilities in the failing heart.

Source: Celyad, June 28, 2016

KIT-302 for OA Pain And Hypertension

Positive results have been reported from a phase 3 study of KIT-302 (Kitov Pharmaceuticals), a combination of the nonsteroidal anti-inflammatory drug (NSAID) celecoxib and the calcium-channel blocker (CCB) amlodipine besylate. The investigational medication was designed to treat osteoarthritis (OA) pain along with hypertension, a common adverse effect of stand-alone OA pain drugs. The study results suggested that KIT-302 may have beneficial effects on renal function. Damage to renal function can be a serious adverse effect of NSAIDs.

Peripheral edema was reported in 15.6% of patients receiving amlodipine compared with 8.2% of patients receiving KIT-302. These data suggest that KIT-302 may protect against amlodipine's potential to cause renal fluid retention, according to Kitov. The final results also showed a mean reduction in daytime systolic blood pressure of 8.8 mm Hg in the amlodipine group compared with a reduction of 10.6 mm Hg in the KIT-302 group ($P = 0.001$).

Source: Kitov Pharmaceuticals, June 24, 2016

Probuphine for Opioid Dependence

New data from a phase 3 study of Probuphine (Braeburn Pharmaceuticals), a six-month subdermal buprenorphine implant for the long-term maintenance treatment of opioid dependence, were presented at the annual scientific meeting of the College on Problems of Drug Dependence. The FDA approved Probuphine in May 2016.

A previous efficacy analysis showed that 96.4% of participants in the Probuphine group had at least four months without evidence of drug use compared with 87.8% of the sublingual buprenorphine group ($P = 0.034$). In the new data, a statistically significant difference was noted between Probuphine and sublingual buprenorphine in the proportion of subjects for all six months of treatment without evidence of illicit opioid use (85.7% versus 71.9%, respectively; $P = 0.03$).

Source: Braeburn Pharmaceuticals, June 16, 2016

Inotuzumab Ozogamicin for ALL

Positive results have been reported from a phase 3, open-label, randomized study evaluating the safety and efficacy of inotuzumab ozogamicin (Pfizer/UCB) compared with investigator-choice chemotherapy in 326 adults with relapsed or refractory CD22-positive acute lymphoblastic leukemia (ALL).

The study met its first primary endpoint of a complete response, which was significantly better with inotuzumab ozogamicin compared with chemotherapy (80.7% versus 29.4%, respectively; $P < 0.001$). The second primary endpoint of overall survival (OS) showed a strong trend toward longer OS for patients treated with inotuzumab ozogamicin compared with chemotherapy but did not reach statistical significance (hazard ratio, 0.77; median OS, 7.7 months versus 6.7 months, respectively).

Inotuzumab ozogamicin is an investigational antibody–drug conjugate consisting of a monoclonal antibody targeting CD22, a cell-surface antigen found on cancer cells, linked to a cytotoxic agent, calicheamicin. When inotuzumab ozogamicin binds to the CD22 antigen on malignant B cells, it is thought to be internalized into the cell, where the calicheamicin is released to destroy the cell.

Source: Pfizer, June 12, 2016

Blincyto for ALL

In an interim analysis of the phase 3 TOWER trial, blinatumomab (Blincyto, Amgen) demonstrated an almost two-fold increase in median overall survival (OS) compared with standard of care (SoC). The randomized, open-label study compared the efficacy of blinatumomab with that of SoC chemotherapy in adults with Philadelphia chromosome-negative (Ph–) relapsed or refractory B-cell precursor acute lymphoblastic leukemia (ALL). The results from this analysis showed that median OS was 7.7 months for blinatumomab compared with 4.4 months for SoC (hazard ratio, 0.71; $P = 0.012$).

Blinatumomab is a bispecific CD19-

directed CD3 T-cell engager (BiTE) antibody construct that binds specifically to CD19 expressed on the surface of cells of B-lineage origin and to CD3 expressed on the surface of T cells.

Source: Amgen, June 10, 2016

Revolade for Thrombocytopenia

Findings from the EXTEND trial have confirmed the long-term safety of eltrombopag (Revolade, Novartis) in adults with chronic immune (idiopathic) thrombocytopenia (ITP), with data for up to six years in some patients (median exposure, 2.4 years). Efficacy results from 302 subjects demonstrated that median platelet counts were elevated to greater than or equal to 50×10^9/L within two weeks of eltrombopag treatment, with median platelet counts greater than 50×10^9/L maintained for more than four years. Most of the bleeding that occurred during more than six years of the study was grade 1 in severity, according to the World Health Organization bleeding scale. In addition, 91.4% (276/302) of patients achieved platelet counts greater than or equal to 30×10^9/L without rescue treatment, and 85.8% (259/302) achieved platelet counts greater than or equal to 50×10^9/L without rescue treatment.

Source: Novartis, June 10, 2016

Baricitinib for RA

Data from a pivotal long-term extension study, RA-BEYOND, demonstrated that baricitinib (2 mg or 4 mg) was superior to placebo at inhibiting progressive radiographic joint damage in patients with rheumatoid arthritis (RA). These treatment benefits were maintained through 48 weeks of therapy. The greatest benefits across measures of progressive joint damage were observed for the 4-mg baricitinib dose.

Baricitinib is a once-daily, oral, highly selective Janus kinase 1 (JAK1) and JAK2 inhibitor currently in late-stage clinical studies for the treatment of inflammatory and autoimmune diseases.

Source: Eli Lilly, June 9, 2016

Erenumab for Chronic Migraine

Amgen has announced positive results from a global phase 2 study evaluating the efficacy and safety of erenumab (AMG 334) in preventing chronic migraine. The study met its primary endpoint of a reduction in monthly migraine days. This reduction was statistically significant for both the 70-mg and 140-mg doses.

At baseline, the study subjects were experiencing approximately 18 migraine days per month. The subjects were randomly assigned to receive either placebo or one of two erenumab doses (70 mg or 140 mg) subcutaneously, once monthly. The subjects experienced a 6.6-day reduction from baseline in monthly migraine days in each of the erenumab treatment arms compared with a 4.2-day reduction in the placebo arm.

Erenumab is a fully human monoclonal antibody that specifically targets the calcitonin gene-related peptide (CGRP) receptor, which is believed to transmit signals that can cause incapacitating pain.

Source: Amgen, June 8, 2016

Benlysta for SLE

Data presented at the Annual European Congress of Rheumatology showed that patients with highly active systemic lupus erythematosus (SLE) experienced a significantly greater response to treatment with belimumab (Benlysta, GlaxoSmithKline) 200 mg administered via subcutaneous injection plus standard of care (SoC) compared with placebo plus SoC (64.6% versus 47.2%, respectively; $P = 0.0014$) after 52 weeks of therapy. In a secondary endpoint, patients in the belimumab group showed a 62% reduction in their risk of experiencing a severe flare compared with those in the placebo group (hazard ratio, 0.38; $P < 0.0001$). A severe flare occurred in 14.1% of the belimumab group during the course of the study compared with 31.5% of the placebo group.

Belimumab is a human monoclonal antibody that selectively targets B-lymphocyte stimulator, an important factor in the survival of B cells. The drug was approved by the FDA for the treatment of SLE in 2011.

Source: GlaxoSmithKline, June 8, 2016

Vaccine for Zika Infection

Inovio Pharmaceuticals and GeneOne Life Science have received FDA approval to initiate a phase 1 human trial to evaluate Inovio's Zika DNA vaccine GLS-5700. In preclinical testing, the synthetic vaccine induced antibody and T-cell responses in small and large animal models. The open-label, dose-ranging study will evaluate the safety, tolerability, and immunogenicity of GLS-5700 administered intradermally with Cellectra, Inovio's proprietary DNA delivery device, in 40 healthy subjects.

Inovio and GeneOne are developing GLS-5700 with academic collaborators in the United States and Canada, with whom they previously collaborated to advance Inovio's Ebola and Middle East respiratory syndrome vaccines into clinical development. No vaccine or therapy currently exists for Zika virus infection.

Source: Inovio Pharmaceuticals, June 20, 2016

DEVICE APPROVALS

Cartiva Synthetic Cartilage

Cartiva, Inc., has received premarket approval from the FDA for its Cartiva Synthetic Cartilage Implant (SCI) for arthritis of the big toe joint. The approval allows the company to begin U.S. marketing of the first synthetic cartilage device cleared by the FDA.

Cartiva SCI is intended for the treatment of painful arthritis at the base of the big toe, the most common arthritic condition in the foot. It is a biocompatible,

biomedical polymer implant designed to have physical properties similar to those of articular cartilage. Damaged cartilage is replaced with a small Cartiva SCI implant, which provides a cartilage-like compressible, low-friction, durable bearing surface.

Source: Cartiva, July 5, 2016

Absorb Bioresorbable Stent

The FDA has authorized marketing of the Absorb bioresorbable heart stent (Abbott) for the treatment of patients with coronary artery disease (CAD). Absorb is the only fully dissolving stent approved for CAD, which affects 15 million people in the United States and remains a leading cause of death worldwide.

While heart stents are traditionally made of metal, the Absorb stent is made of a naturally dissolving material, similar to dissolving sutures. Absorb stents disappear completely in approximately three years. In contrast, metal stents are permanent implants that restrict vessel motion for the life of the person treated.

Abbott plans to offer the Absorb devices to U.S. hospitals, starting with interventional cardiology centers that participated in clinical trials of the stent.

Source: Abbott, July 5, 2016

Image Navigator Automated Microscope

The FDA has cleared the Image Navigator automated microscope (Immuno Concepts) through the 510(k) process. The Image Navigator is a software program that controls an LED fluorescent microscope with a motorized stage to simplify and organize indirect immunofluorescent testing. It automatically captures images of each specimen; sorts the images into "possible negative" and "possible positive" categories with a precision exceeding 97%; and displays them for final review and confirmation by the user.

Source: Immuno Concepts, July 5, 2016

Expanded Claims for Xpert Carba-R Test

The FDA has authorized expanded claims for the Xpert Carba-R assay (Cepheid), the first FDA-approved test for the detection of carbapenem resistance genes in multidrug-resistant "superbugs." After initial clearance in March 2016 for the detection and differentiation of carbapenemase genes in pure bacterial isolates, the latest clearance extends use of the assay to include the analysis of direct rectal swab specimens, and positions the Xpert Carba-R test as a tool for the identification of colonized patients.

Source: Cepheid, June 30, 2016

Implantable Corneal Device

The FDA has approved the Raindrop Near Vision Inlay (Revision Optics, Inc.), a device implanted in the cornea of one eye to improve near vision in certain patients with presbyopia. It is the second FDA-approved implantable corneal device for the correction of near vision in patients who have not had cataract surgery and the first implantable device that changes the shape of the cornea to achieve improved vision.

The Raindrop Near Vision Inlay is a clear device made of a hydrogel material and resembles a tiny contact lens smaller than the eye of a needle. It is indicated for use in patients 41 to 65 years of age who, in addition to not having had cataract surgery, are unable to focus clearly on near objects or small print and need reading glasses with +1.50 to +2.50 diopters of power—but do not need glasses or contacts for clear distance vision.

Source: Revision Optics, June 29, 2016

Procalcitonin Assay for Sepsis

Roche has received 510(k) clearance for its Elecsys BRAHMS PCT (procalcitonin) assay for patients with severe sepsis or septic shock. PCT is a sepsis-specific biomarker associated with bacterial infection, and PCT levels in the blood can aid clinicians in assessing the risk of sepsis as well as in managing the disease when present. The Elecsys BRAHMS PCT assay can help clinicians assess the risk of progressing from severe sepsis to septic shock in critically ill patients, and can help determine the 28-day mortality risk in sepsis patients, according to Roche.

Source: Roche, June 23, 2016

AspireAssist for Obesity

The FDA has approved an obesity treatment device that uses a surgically placed tube to drain a portion of the stomach contents after every meal. To place the AspireAssist device (Aspire Bariatrics), surgeons insert a tube in the stomach with an endoscope via a small incision in the abdomen. A disk-shaped port valve that lies outside the body, flush against the skin of the abdomen, is connected to the tube and remains in place. Approximately 20 to 30 minutes after meal consumption, the patient attaches the device's external connector and tubing to the port valve, opens the valve, and drains the contents. Once opened, it takes approximately five to 10 minutes to drain food matter through the tube and into the toilet. The device removes approximately 30% of the calories consumed.

Source: FDA, June 14, 2016

DEVICE RESEARCH

Wrap-Around Heart Mesh

A research team led by investigators at Beth Israel Deaconess Medical Center and Seoul National University has developed an electric mesh device that can be wrapped around the heart to deliver electrical impulses to the entire ventricular myocardium, thereby improving cardiac function in experimental models of heart failure. The device consists of nanowires embedded in a rubber polymer that can conform to the unique three-dimensional anatomy of individual hearts.

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Research teams at seven institutes in the United States, China, and the Republic of Korea developed the novel nanomaterial; created an elastic electrical device; tailored the device through 3D printing; conducted a pre-assessment of mechanics through computer simulation; and conducted functional *in vivo* assessments of the device in animals.

Source: Beth Israel Deaconess Medical Center, June 28, 2016

EndoBarrier for Obesity, Diabetes

Final results have been reported from a U.S. pivotal study of the EndoBarrier device (GI Dynamics, Inc.) in subjects with uncontrolled type-2 diabetes and obesity. The study was terminated early because of a higher-than-normal incidence of liver abscess, which can be fatal.

The EndoBarrier device is an endoscopically delivered, flexible, tube-shaped liner that acts as a shield between food and part of the intestinal wall. This allows the food to bypass the duodenum in a nonsurgical alternative to gastric bypass.

The ENDO trial demonstrated clinically meaningful improvements in hemoglobin A_{1c} levels and weight reduction with the EndoBarrier device compared with a sham procedure in 325 subjects. However, the rate of hepatic abscess was 3.5%—almost five times the rate seen with commercially available units outside the U.S. Moreover, device-related serious adverse events requiring early removal occurred in 10.9% of the EndoBarrier group.

The EndoBarrier device is commercially available outside the U.S. but is not approved for use in this country.

Source: GI Dynamics, June 23, 2016 ■