TRENDS-in-MEDICINE

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by Lynne Peterson

Quick Takes

…Highlights from this week's news relating to drugs and devices in development that are not covered in other *Trends-in-Medicine* reports…

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Top news of the week (*read details in other sections of Quick Takes*)

- ✓ ABBVIE and ROCHE's Venclexta (venetoclax) – The FDA imposed a partial clinical hold on trials of this Bcl-2 inhibitor in multiple myeloma.
- ✓ BIOGEN and EISAI's aducanumab is the latest Alzheimer's drug to crash and burn.
- ✓ Breast implants – The FDA sent warning letters to Sientra and Johnson & Johnson/ Mentor for failing to complete postmarketing studies of their silicone breast implants.
- ✓ LEXICON PHARMACEUTICALS and SANOFI's Zynquista (sotagliflozin), an oral SGLT1/2 inhibitor for Type 1 diabetes, was rejected by the FDA.
- ✓ PFIZER and MERCK KGAA's Bavencio (avelumab) failed to show efficacy in an interim analysis of a Phase III trial in ovarian cancer, and the trial was halted.
- ✓ SAGE THERAPEUTICS' Zulresso (brexanolone) was approved to treat postpartum depression, but administration isn't easy, and it will be expensive.
- ✓ UROVANT SCIENCES' vibegron met both co-primary endpoints in the Phase III EMPOWUR trial in overactive bladder.

SHORT TAKES

- ADHD – A study, published in the ***New England Journal of Medicine***, found that adolescents and young adults with attention-deficit/hyperactivity disorder (ADHD) who take an amphetamine-based drug [e.g., Takeda/Shire's Adderall or Vyvanse (lisdexamfetamine)] are at higher risk of a psychotic event vs. methylphenidate agents [e.g., Novartis' Ritalin (methylphenidate) or Johnson & Johnson's Concerta (methylphenidate extended-release]. *While the risk may be considered low (1 in 660), that is still a lot of kids having psychotic events.*
- AERPIO PHARMACEUTICALS' AKB-9778 – This Tie2 activator missed the primary endpoint in the Phase IIb TIME-2b trial in moderate-to-severe non-proliferative diabetic retinopathy, with no significant difference between drug and placebo in terms of patients achieving ≥2-point improvement in diabetic retinopathy severity score (DRSS) – 9.6% vs. 3.8% (p=0.27).
- AIMMUNE THERAPEUTICS' AR-101 – A new drug application (NDA) for this oral peanut allergy treatment was accepted for review by the FDA, with a standard 12-month review, which would put the PDUFA date in January 2020. The company said there will be an advisory committee meeting to discuss the drug.
- ALLERGY THERAPEUTICS' Pollinex Quattro Birch (B-301), a birch allergy vaccine, missed the primary endpoint in a 582-patient European study, failing to significantly reduce the combined symptom medication score.

- BAXTER is partnering with **bioMérieux/Astute Medical** on development of biomarkers for acute kidney injury.

- BOSTON SCIENTIFIC's Luminize RF – In the100-patient AFFICIENT-I study, presented at the European Heart Rhythm Association (EHRA) meeting in Lisbon, Portugal, this single-shot balloon catheter for atrial fibrillation had an 88.9% rate of pulmonary vein isolation in the first phase (with the original design) and a 99.4% rate in the second phase (with improved steering and electrodes).

- BRAINLAB bought **Medineering**, which develops application-specific robotic technologies, including **Cirq**, an intuitive surgical assistant.

- CELGENE is collaborating with **Exscientia**, an artificial intelligence drug discovery company, on small molecule drug discovery for three projects in oncology and autoimmunity.

- CONATUS and NOVARTIS' emricasan failed in the 318-patient Phase II ENCORE-NF trial in biopsy-confirmed non-alcoholic steatohepatitis (NASH) and liver fibrosis patients, failing to significantly improve fibrosis by ≥1 on CRN staging – with no worsening of steatohepatitis – at Week 72. The response rates were 11.2% with 5 mg, 12.3% with 50 mg, and 19.0% with placebo.

- CURE PHARMACEUTICAL – The Drug Enforcement Administration (DEA) granted an expanded license to allow manufacturing of precuts containing synthetic cannabidiol (CBD) and from extracts of the cannabis plant (e.g., hemp-based CBD) as well as products containing synthetic tetrahydrocannabinol (THC).

- CYTOKINETICS and AMGEN's omecamtiv mecarbil – Based on a pre-planned interim analysis of the ~8,000-patient Phase III GALACTIC-HF trial of this cardiac myosin activator in heart failure, the independent data monitoring committee said the trial can continue unchanged.

- DERMIRA's lebrikizumab – The company reported that all three doses of this anti-IL-13 met the primary endpoint in a 280-patient Phase IIb trial in moderate-to-severe atopic dermatitis, with improvement in the EASI score of 62.3% with 125 mg, 41.1% with 250 mg Q2W, and 72.1% with 250 mg Q4W. On the secondary endpoints, only the 250 mg doses were successful.

- EOFLOW's EOPancreas, a closed-loop automated insulin delivery system – a wearable patch, a blood glucose control algorithm, and a continuous glucose monitor (CGM) – for Type 1 diabetics was granted breakthrough device designation by the FDA.

- Excipients – A study by Massachusetts Institute of Technology researchers, published in ***Science Translational Medicine***, found that 93% of medications contain excipients that have the potential to cause an allergic reaction.

- JOHNSON & JOHNSON/ALIOS BIOPHARMA's lumicitabine (AL-8176) – J&J has scuttled development of this oral treatment for respiratory syncytial virus (RSV) that it got with the purchase of Alios in 2014.

- LEXICON PHARMACEUTICALS and SANOFI's Zynquista (sotagliflozin), an oral SGLT1/2 inhibitor for Type 1 diabetes, was rejected by the FDA.

- NATIONAL MOBILE X-RAY bought **MMDS Mobile X-ray**.

- NEURONIX' neuroAD Therapy System – The FDA's Neurological Devices Advisory Committee recommended against de novo clearance of this non-invasive transcranial magnetic stimulation (TMS) system, combined with cognitive training, to treat mild-to-moderate Alzheimer's disease dementia. The panel agreed with the FDA staff that there are still too many questions about the efficacy of the device.

- NOVARTIS/ALCON bought **PowerVision**, a fluid-based intraocular lens developer.

- Ovarian cancer – A 22-patient study, presented at the Society of Gynecologic Oncology (SGO) meeting in Honolulu, found that some women with ovarian cancer who responded to a first-line PARP inhibitor, but who then lost the response, responded to a different PARP inhibitor, particularly if they were BRCA+ when rechallenged.

- PFO closure – The Society for Cardiovascular Angiography and Interventions (SCAI), in conjunction with other medical societies, is recommending that operators and hospitals doing patent foramen ovale (PFO) closures maintain a volume of ≥30 septal interventions (or >15 PFO closures) every two years.

- POLARITYTE's SkinTE – The company is under investigation by the Securities and Exchange Commission (SEC) relating to public disclosures and ownership but not specifically this skin repair product.

- PUMA BIOTECHNOLOGY's neratinib – Updated results from the open-label Phase II SUMMIT basket trial in HER2+ cancer, presented at the SGO meeting, showed a treatment effect in the 11-patient cervical cancer cohort, with an objective response rate of 27.3%, progression-free survival (PFS) of 7.0 months, and disease control rate of 54.5%.

- RECRO PHARMA's IV meloxicam, a treatment for moderate-to-severe pain, was rejected for the second time by the FDA, which once again issued a complete response letter (CRL) that focused on the onset and duration of effect.

- ROCHE's Tecentriq (atezolizumab) – Interim results of the ongoing, ~1,000-patient Phase IIIb SAUL trial in locally advanced/metastatic urothelial carcinoma, presented at the European Association of Urology (EAU) meeting in Barcelona, Spain, showed that both safety (the primary endpoint) and efficacy (a secondary endpoint) were consistent with previous studies in both the overall population and the subgroup of patients similar to the patients in the pivotal Phase III trial, IMvigor211. The analysis showed 43% of patients had a Grade 3-4 adverse event, with 13% treatment-related. The most common side effects were fatigue, asthenia, colitis, and hypertension. Overall survival was 8.7 months but 10 months in the IMvigor211-like patients.

- ROIVANT's RVT-801, an investigational enzyme replacement therapy for Farber disease, was granted both rare pediatric disease and fast track status by the FDA.

- Testosterone – A 316-patient German study, published in *Diabetes Care*, found that men with prediabetes and hypogonadism who got testosterone therapy had a reduction in HbA_{1c}, with 90% achieving normal glucose levels vs. 40.2% of untreated men who progressed to Type 2 diabetes.

- TONIX PHARMACEUTICALS' Tonmya (TNX-102 SL, sublingual cyclobenzaprine) – The FDA withdrew breakthrough therapy designation from this post-traumatic stress disorder drug after interim data from a trial showed that the study was futile in terms of efficacy.

- Transcatheter arterial embolization (TAE) – A 52-patient Japanese study, presented at the Society of Interventional Radiology (SIR) meeting in Austin, TX, found that TAE can effectively treat the pain and inflammation of lateral epicondylitis (tennis elbow). At four years, patients had a statistically significant reduction in pain-rating scores (including VAS). In addition, imaging was done in 32 patients two years after TAE and showed an improvement in tendinosis and tear scores.

- UROVANT SCIENCES' vibegron, a β3-adrenergic agonist, met both co-primary endpoints at Week 12 in top-line results from the double-blind Phase III EMPOWUR trial in overactive bladder, significantly reducing both daily urge incontinence episodes and micturitions vs. placebo. The effect was clear at Week 2, with the effect maintained over the duration of the study.

Very early research news

- Fibromyalgia – Ohio State University researchers reported in the *Journal of Biological Chemistry* on their discovery of biomarkers for fibromyalgia that can be detected in blood samples. This could help with diagnosis and lead to new treatments.

- Neuropathic pain – By studying RNA expression in dorsal root ganglia (DRG) cells, researchers reported in the journal *Brain* on an advance in the understanding of the source of neuropathic pain in humans. They identified a group of biochemical pathways that could lead to new analgesics.

NEWS IN BRIEF

ALEXION PHARMACEUTICALS

- Is collaborating with **Zealand Pharma** on development of peptide therapies for complement-mediated diseases.

- Is collaborating with Affibody on development of **Affibody's ABY-039** for rare immunoglobulin G (IgG)-mediated autoimmune diseases.

BIOFRONTERA

- Ameluz (aminolevulinic acid), a topical gel used in combination with photodynamic therapy (with the BF-RhodoLED lamp), was superior to placebo in clearing actinic keratoses lesions (86% vs. 33%) in a Phase III trial.

- Extended its research agreement with **Manuho** on branded generics.

BIOGEN and EISAI

- Aducanumab. The companies terminated two Phase III trials (EMERGE and ENGAGE) in patients with mild cognitive impairment due to Alzheimer's disease after a futility analysis showed the trials were unlikely to meet the primary endpoint.

- BAN-2401. The failure of aducanumab apparently hasn't discouraged Eisai about Alzheimer's disease treatments because, right after the announcement of the aducanumab failure, Eisai announced it is launching the 1,566-patient Phase III CLARITY-AD trial of this anti-amyloid-beta, partnered with Biogen, in Alzheimer's disease patients with mild cognitive impairment.

GLAXOSMITHKLINE

- GSK-2857916. The company reported updated data from the 35-patient Part 2 of the DREAMM-1 trial in multiple myeloma with this anti-BCMA antibody drug conjugate, saying there is now a 60% response rate, PFS of 12 months (up from 7.9 months), and duration of response of 14.3 months.
- TESARO's dostarlimab (TSR-042). The preliminary results of the Phase I/II GARNET trial of this anti-PD-1 in advanced/recurrent endometrial cancer, presented at SGO, showed clinically meaningful and durable response rates, regardless of microsatellite instability (MSI) status. The overall response rate ranged from 20% in MSS (microsatellite stable) to 49% in MSI-high patients. The durability of response was similar between MSI-H and MSS. The treatment also was well tolerated. Tesaro plans to submit dostarlimab to the FDA later this year.
- TESARO's Zejula (niraparib). An analysis of the 553-patient Phase III NOVA trial, presented at the SGO meeting, found that this PARP1/2 inhibitor used ≥3-line not only delayed disease progression in recurrent ovarian cancer but also increased patients' time without symptoms or toxicity (TWiST) by 2.95 years in women with a BRCA mutation and by 1.34 years for women without that mutation.

Liquid biopsies

- ILLUMINA and GRAIL. A new liquid biopsy developed jointly by these companies looked good in a study, published in the *Annals of Oncology*, showing that liquid biopsies were able accurately to identify the genetic variants that either drive lung cancer or make it resistant to treatment. The researchers used ultra-deep next-generation sequencing (NGS) to analyze cell-free DNA (cfDNA) to detect variants of 37 genes involved in lung cancer and compared that to tissue biopsies. The researchers reported that:
  - Of the 91 patients where a tissue biopsy had found cancer-driving mutations, an analysis of the liquid biopsy detected 68, for a true positive rate of 75%.
  - Among the 19 patients without mutations detected in the tissue biopsy, the liquid biopsy also did not detect any mutations (no false positives) for a true negative rate of 100%.
  - Among the 17 patients for whom there was no available tissue biopsy, the liquid biopsy detected cancer-driving mutations in four patients. One of these later had a tissue biopsy, which confirmed the mutation.

The researchers concluded that liquid biopsy can play a complementary role to tissue biopsy in treating lung cancer. Since the specificity was 100%, they suggested using it first and to guide treatment. However, if the liquid biopsy is negative, they said a tissue biopsy should be done.

MERCK MSD

- Stromectol (ivermectin). An 18-week study in the African country of Burkina Faso, published in *The Lancet*, found that repeated mass administration of this anti-parasitic reduced the incidence of malaria in children age ≤5 by 20%.
- Expanded its collaboration with NGM Biopharmaceuticals by two years but terminated a license to NGM's GDF-15, a growth differentiation factor 15 progam in obesity.

NOVO NORDISK

- Oral semaglutide
  - An NDA was submitted, seeking a label that it reduces the risk of major adverse cardiovascular events (MACE) in Type 2 diabetes patients with established cardiovascular disease.
  - Another NDA for this oral GLP-1 agonist was submitted to the FDA to treat Type 2 diabetes, using a priority review voucher to speed the review time.
- Ozempic (weekly injectable semaglutide). A supplemental new drug application (sNDA) was submitted to the FDA seeking expanded approval to include reducing the risk of MACE in Type 2 diabetics with a history of cardiovascular disease.

PFIZER

- and MERCK KGAA's Bavencio (avelumab). An interim analysis of the Phase III JAVELIN Ovarian PARP 100 trial in previously untreated advanced ovarian cancer found no improvement in progression-free survival (the primary endpoint) with this PD-L1 inhibitor + chemotherapy vs. chemotherapy alone (3.7 months vs. 3.5 months). There also was no improvement in overall survival (15.7 months vs. 13.1 months). The companies announced they are halting the trial, saying, this "emphasizes the need to better understand the role of immunotherapy in ovarian cancer."
- VIVET THERAPEUTICS' VTX-801. Pfizer is collaborating on development of this treatment for Wilson disease and acquired an option to buy this privately-held biotech that is working in inherited liver disorders.

REGULATORY NEWS

Regulatory tidbits

- Acute care hospitals. In its annual report to Congress, the Medicare Payment Advisory Commission (MedPAC) proposed increasing payments to acute care hospitals by less than expected – 2% instead of 2.8% – with the difference to be used to reward participants under a quality incentive program. The panel also recommended eliminating $1 billion in penalties incurred by hospitals annually under two incentive programs, and it proposed replacing the four current incentive programs with a single program.
- Electronic health records (EHRs). FDA Commissioner Scott Gottlieb, MD, is calling for stricter scrutiny of EHR systems after reports of patient deaths and injuries related to the conversion from paper to electronic records. The 21st Century Cures Act prevents the FDA from overseeing EHRs as medical devices, and Dr. Gottlieb said companies have not added functionality that could improve the systems because of concern the changes would bring them under FDA oversight.
- Genome editing. A World Health Organization (WHO) committee is urging WHO to create a central registry of human genome editing research.
- HIV. The FDA issued two sets of final guidances on drug development, one for pre-exposure prophylaxis (PrEP) and another for pediatric patients with HIV.
- Implants. The FDA is re-evaluating the science around the materials used in long-term medical device implants.
- Opioids. The chair of the FDA's Anesthetic and Analgesic Drug Products Advisory Committee, Raeford Brown, Jr, MD (a pediatric anesthesiologist from the University of Kentucky) and Sidney Wolfe, MD, (co-founder of Public Citizen's Health Research Group) filed a Citizen Petition, seeking to force the FDA to suspend new approvals of narcotic painkillers.

FDA approvals/clearances

- ALLERGAN's Avycaz (ceftazidime + avibactam) was granted expanded approval for use in pediatric patients age ≥3 months with complicated intra-abdominal, urinary tract infections.
- BECKMAN COULTER's DxH 520, a hematology analyzer, was granted 510(k) clearance for assessing platelets, leucocytes, and red cell counts from a blood sample as small as 17 microliters.
- BECTON DICKINSON's Venovo, a venous stent for treating iliofemoral lesions, was granted premarket approval.
- BIOTRONIK's Rivacor and Acticor families of high-voltage tachycardia devices were granted premarket approval for treating cardiac arrhythmias.
- IMPLANET's Jazz Cap system, single-use sterile implants for facilitating treatment of patients with degenerative conditions, was granted 510(k) clearance.
- IMPULSE DYNAMICS' Optimizer Smart, an implantable device for treating moderate-to-severe chronic heart failure patients who can't get another device (e.g., a cardiac resynchronization therapy, CRT-D), was cleared for use.
- JAZZ PHARMACEUTICALS' Sunosi (solriamfetol) was approved to treat daytime sleepiness associated with narcolepsy or obstructive sleep apnea. However, the drug still needs to be scheduled by the DEA.
- ROCHE/GENENTECH's Tecentriq (atezolizumab), a PD-L1 inhibitor, was approved as a first-line treatment (in combination with chemotherapy) for adults with extensive-stage small cell lung cancer (ES-SCLC).
- SAGE THERAPEUTICS' Zulresso (brexanolone) was approved to treat postpartum depression, but the 60-hour IV infusion will cost $20,000-$35,000 and require a hospital stay.
- SIEMENS HEALTHINEERS' Mobilett Elara Max, a mobile x-ray system, was cleared for use.

FDA recalls/warnings

- ABBVIE and ROCHE's Venclexta (venetoclax) – The FDA imposed a partial clinical hold on trials of this Bcl-2 inhibitor in multiple myeloma, halting new patients but allowing existing patients to continue to be dosed. The problem: a doubling of deaths vs. placebo. The FDA also warned healthcare professionals, oncology investigators, and patients about an increased risk of mortality in multiple myeloma patients taking this drug. However, the FDA said the warning does not apply to patients getting Venclexta for any of the three approved indications.
- Breast implants – The FDA sent warning letters to two breast implant manufacturers – **Sientra** and **Johnson & Johnson/Mentor** – for failing to complete mandated post-marketing studies assessing the safety of silicone-based implants.
- COOK MEDICAL's Transseptal needle was recalled (Class I) due to the risk of detached plastic fragments.
- GLENMARK PHARMACEUTICALS received a Form 483 with five observations about its plant in Goa, India.

- LEGACY PHARMACEUTICAL PACKAGING's losartan – An additional 43 lots of this antihypertensive were recalled due to possible NMBA contamination.
- Losartan – The FDA is permitting temporary distribution of losartan tainted with NMBA because of a shortage of this antihypertensive.
- MEDTRONIC's defibrillators – The U.S. Department of Homeland Security issued a warning that ~750,000 of these cardiac devices have a cybersecurity vulnerability that could let an attacker harm patients by altering programming.
- MYLAN's levoleucovorin – Two lots were recalled after particulate matter was found.
- PFIZER/HOSPIRA's 8.4% sodium bicarbonate injection – Three lots were recalled due to the presence of particulate matter.
- PHOENIX MOLECULAR IMAGING CENTER's Sodium Acetate C-11 – The company received a warning letter from the FDA's Office of Prescription Drug Promotion (OPDP) for marketing this unapproved imaging drug.

European Regulatory News

- *U.K.* NOVARTIS' Kymriah (tisagenlecleucel) – The Scottish Medicines Consortium rejected funding for this CAR T therapy for diffuse B cell lymphoma patients.
- ABBOTT's Alinity M, a diagnostics system and assays for sexually-transmitted and infectious diseases (HIV-1, hepatitis B, hepatitis C, chlamydia, and gonorrhea), was granted a CE Mark.
- ENDOSPAN's Nexus, an aortic arch repair system, was granted a CE Mark for use in branched endovascular repairs.
- NYXOAH's GENIO, an implant-based device for treating obstructive sleep apnea (OSA), was granted a CE Mark.
- OMEGA DIAGNOSTICS GROUP's Visitect CD4 Advanced Disease test for monitoring people with HIV was granted a CE Mark.
- PFIZER's Xeljanz (tofacitinib) – The European Medicines Agency (EMA) issued a warning to doctors and patients not to exceed the approved dose of this JAK inhibitor in rheumatoid arthritis due to a potential risk of pulmonary embolism. The EMA said it is reviewing the early results of the postmarketing study that led to the warning.
- WUXI BIOLOGICS' Trogarzo (ibalizumab-uiyk) – The EMA granted current good manufacturing practices (cGMP) certification for the production of this entry inhibitor for treating HIV-1 at two WuXi plants in China – making it the first EMA-approved Chinese contract development and manufacturing organization (CDMO).

Regulatory news from other countries

- *Australia.* VERTEX PHARMACEUTICALS' Symdeko (tezacaftor + ivacaftor), a combination of two CFTR modulators, was approved to treat cystic fibrosis in patients with two copies of the F508del mutation.
- *Canada.* The government announced plans to create a national drug agency – the Canadian Drug Agency – to help reduce the cost of prescription drugs.
- *Japan.* AYUMI PHARMACEUTICAL, which makes drugs to treat rheumatism, is being acquired by **Blackstone**.

2019 FDA Advisory Committees and Other Regulatory Meetings of Interest (*items in RED are new since last week*)		
Date	**Topic**	**Committee/Event**
tba	**Bausch Health's Duobrii** (halobetasol propionate + tazarotene) for psoriasis	PDUFA date – *FDA delayed February 15 decision by "a little"*
March tba	**Novartis' Mayzent** (siponimod, BAF-312) for secondary progressive multiple sclerosis	PDUFA date
March 21	**Glenmark Pharmaceuticals' Ryaltris** (olopatadine + mometasone furoate) for seasonal allergic rhinitis	PDUFA date ***No announcement yet***
March 22	**Sedor Pharmaceuticals' IM/IV Captisol-Enabled Fosphenytoin** (fosphenytoin sodium and sulfobutylether beta-cyclodextrin sodium for injection) to treat generalized tonic-clonic status epilepticus and seizures during neurosurgery	PDUFA date ***No announcement yet***
March 23	**Palatin Technologies' Vyleesi** (bremelanotide, PT-141) for hypoactive sexual desire	PDUFA date ***Extended by the FDA to June 23***
March 25-26	Discussion of **safety of breast implants**	FDA's General and Plastic Surgery Devices Advisory Committee
March 27	**AllerQuest's PRE-PEN Plus** for detecting IgE sensitization to penicillin antigens to rule out life-threatening penicillin allergic reactions	FDA's Pulmonary-Allergy Drugs Advisory Committee
April 1	**Evoke Pharma's Gimoti** (metoclopramide, EVK-001) for diabetic gastroparesis	PDUFA date *(not expected to be met)*
April 3	**Pharmacy benefit managers** (PBMs) – Cigna, CVS, Humana, United-Healthcare/OptumRx, and Prime Therapeutics – to discuss drug pricing	Senate Finance Committee hearing
April 3-5	**Sentinel Initiative** 5-year plan	FDA public workshop
April 6	**Karyopharm Therapeutics' selinexor** for relapsed/refractory multiple myeloma	PDUFA date *Extended by FDA for 3 months to July 6*
April 11	**Merck MSD's Keytruda** (pembrolizumab) as monotherapy for first-line treatment for locally advanced/metastatic NSCLC in patients PD-L1+ ≥1% without EGFR or ALK mutations	PDUFA date
April 28	**Regeneron Pharmaceuticals** and **Sanofi's Praluent** (alirocumab) label claim for cardiovascular risk reduction	PDUFA date
April 30	**Heron Therapeutics' HTX-011** (bupivacaine + meloxicam) for postoperative pain	PDUFA date
May 1	**Sanofi Pasteur's Dengvaxia** for dengue fever	PDUFA date
May 13	**Regeneron Pharmaceuticals** and **Bayer's Eylea** (aflibercept) expanded approval to treat diabetic retinopathy	PDUFA date
May 21	Discussion of FDA's proposed rule changes for **outsourcing facilities and compounding pharmacies**	FDA public meeting
May 24	**Incyte's Jakafi** (ruxolitinib) for graft-versus-host disease	PDUFA date *Extended by the FDA from February 24*
June 10	**Xeris Pharmaceuticals' liquid glucagon autoinjector** for severe hypoglycemia	PDUFA date
June 10	**Merck MSD's Keytruda** (pembrolizumab) for first-line treatment, as monotherapy or in combination with chemotherapy, for recurrent/metastatic squamous cell head and neck cancer	PDUFA date
June 17	**Merck MSD's Keytruda** (pembrolizumab) for monotherapy of ≥3-line advanced SCLC	PDUFA date
June 20	**Merck MSD's Keytruda** (pembrolizumab) for first-line treatment, in combination with Pfizer's Inlyta (axitinib) for advanced renal cell carcinoma	PDUFA date
June 23	**Palatin Technologies' Vyleesi** (bremelanotide, PT-141) for hypoactive sexual desire	PDUFA date ***Extended by the FDA from March 23***
June 25	**Acer Therapeutics' Edsivo** (celiprolol) to treat vascular Ehlers-Danlos syndrome	PDUFA date
June 26	**Sanofi** and **Regeneron Pharmaceuticals' Dupixent** (dupilumab), expanded approval to treat severe chronic rhinosinusitis with nasal polyps	PDUFA date
June 28	**Alexion Pharmaceuticals' Soliris** (eculizumab) – expanded approval to include neuromyelitis optica spectrum disorder in patients with anti-aquaporin-4 antibodies	PDUFA date
June 30	**Nabriva Therapeutics' Contepo** (fosfomycin) for complicated urinary tract infections	PDUFA date

2019 FDA Advisory Committees and Other Regulatory Meetings – continued (*items in RED are new since last week*)		
Date	**Topic**	**Committee/Event**
July 6	**Karyopharm Therapeutics' selinexor** for relapsed/refractory multiple myeloma	PDUFA date *Extended by FDA from April 6*
August 3	**Daiichi Sankyo's pexidartinib** for treatment of tenosynovial giant cell tumor (TGCT)	PDUFA date
August 18	**Roche's entrectinib** for NTRK fusion-positive solid tumors and ROS1+ metastatic non-small cell lung cancer (NSCLC)	PDUFA date
August 19	**Roche's polatuzumab vedotin** for relapsed/refractory DLBCL	PDUFA date
September tba	**Lilly's Emgality** (galcanezumab-gnlm), expanded approval of this CGRP inhibitor to treat episodic cluster headaches	PDUFA date
September 3	**Celgene's fedratinib**, a JAK2 inhibitor for myelofibrosis	PDUFA date
September 27	**Intra-Cellular Therapies' lumateperone** for schizophrenia	PDUFA date
November 4	**Roche's Xofluza** (baloxavir marboxil), expanded use as a single-dose treatment for patients at high risk of flu complications	PDUFA date