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The Year's Clinical Trials In Review: Big Hits In 2017

by Emily Hayes

Scrip takes a trip back through the highs of drug development, looking at successes including positive cardiovascular outcomes studies for cholesterol drugs, advances in cancer and breakthroughs in hemophilia.

When it comes to pharmaceutical drug development the wins can be few and far between, but when a new drug performs well in a mid- to late-stage clinical trial, the rewards can be rich – for patients and investors. Here are some of the notable clinical trial successes in 2017.

CV Outcomes Studies Galore

The long-awaited release of full results for *Amgen Inc.*'s FOURIER cardiovascular (CV) outcomes study of the cholesterol-lowering PCSK9 inhibitor *Repatha* (evolocumab) finally came in March 2017, at the American College of Cardiology meeting. (Also see "*Is Amgen's FOURIER Enough For Physicians, Payers To Expand Repatha Use?*" - Scrip, 17 Mar, 2017.) The drug demonstrated a statistically significant reduction in the number of events included in the primary composite endpoint, though the magnitude of the benefit (15%) was lower than expected. Repatha now has a CV outcomes claim based on the data. (Also see "*Outcomes Claim May Help Amgen Make Case For PCSK9 Inhibitor Repatha*" - Scrip, 1 Dec, 2017.)

How this will translate into reimbursement access and sales remains to be seen, but the drug already started to outperform *Sanofi*/*Regeneron Pharmaceuticals Inc.*'s competing PCSK9 inhibitor *Praluent* (alirocumab) in the fourth quarter of 2016. Results from the ODYSSEY CV outcomes study of Praluent are due in early 2018.

Merck & Co. Inc. announced in June that its cholesterol-lowering anacetrapib significantly reduced major coronary events in the REVEAL CV outcomes study, a surprising outcome in light of failures of other drugs in the CETP inhibitor class. (Also see "*Big REVEAL: Merck's Anacetrapib Surprises With Success, But What Next?*" - Pink Sheet, 27 Jun, 2017.) However, due to the commercial challenges of launching this kind of candidate, Merck opted not to pursue regulatory

approval. (Also see "*Merck Calls It Quits On Anacetrapib*" - Pink Sheet, 11 Oct, 2017.)

Other CV outcomes successes include positive results for *Johnson & Johnson*'s SGLT2 inhibitor/diabetes drug *Invokana (*canaglifozin) in the CANVAS outcomes study and *Novartis AG*'s IL-1β inhibitor antibody canakinumab (ACZ885) in the CANTOS atherosclerosis study. (Also see "*CANVAS Trial Results: Better For Janssen, Lilly Or the SGLT2 Class?*" - Scrip, 13 Jun, 2017.) and (Also see "*CANTOS Trial Brings Unexpected CVD Promise For Novartis & Regeneron*" - Scrip, 22 Jun, 2017.)

These positive data contrasted with negative results for *AstraZeneca PLC*'s diabetes drug *Bydureon* (long-acting exenatide) in the Phase IIIb/IV EXSCEL outcomes study. (Also see "*Disappointing Bydureon EXSCEL Outcomes Data May Raise Stakes For Victoza*" - Scrip, 23 May, 2017.)

Welcome To Viiv's Two-Drug HIV Combo

The possibility of a two-drug regimen for HIV maintenance therapy became a reality with the release of full data from the pivotal SWORD studies for *ViiV Healthcare*'s *Tivicay* (dolutegravir) and *Janssen Pharmaceuticals Inc.*'s *Edurant* (rilpivirine) in February. (Also see "*ViiV/Janssen's Double-Edged SWORD: Four Drugs Good, Two Drugs Better?*" - Scrip, 14 Feb, 2017.) (Viiv is majority owned by *GlaxoSmithKline PLC*.) The US FDA approved the regimen in November for patients with HIV type 1 whose virus has been suppressed for at least six months, after a speedy review thanks to a priority review voucher, and the fixed combination pill is now branded as *Juluca*. Analysts say the introduction of a two-drug regimen is groundbreaking for the HIV market, though it may take time to introduce such a big change. (Also see "*ViiV's Two-Drug HIV Tablet Juluca Is Disruptive, Yet Uptake May Be Slow*" - Scrip, 22 Nov, 2017.)

A Good Year In Hemophilia

The year closed out with gene therapy coming into its own, with the approval of *Spark Therapeutics Inc.*'s *Luxturna* and hemophilia gene therapies drawing attention at the American Society of Hematology (ASH) annual meeting in December. Early data for Spark's hemophilia B candidate SPK-9001, partnered with *Pfizer Inc.*, and *BioMarin Pharmaceutical Inc.*'s valoctocogene roxaparvovec in hemophilia A both received glowing reviews in the *New England Journal of Medicine* – editorials suggested that a cure for the devastating disease is now in sight. (Also see "*Spark Plots Rebound For Hemophilia A Gene Therapy, As Rival BioMarin Surges*" - Scrip, 12 Dec, 2017.)

The hemophilia treatment space has also recently undergone a big change with the approval of *Roche*'s *Hemlibra* (emicizumab), a bispecific monoclonal antibody that binds to both Factor IXa and X, for hemophilia A with inhibitors. (Also see "*Roche's Hemlibra Priced And Labeled To Beat Competition, Safety Concern*" - Scrip, 17 Nov, 2017.)

The company also announced positive results from the HAVEN 3 study of patients with hemophilia and no inhibitors, data that could see the drug used in a much bigger population, and HAVEN 4, which tested a more convenient monthly dosing schedule. (Also see "*Non-Inhibitor Data Secure Roche's Competitive Position In Hemophilia A*" - Scrip, 20 Nov, 2017.) Updated data from older studies presented at the ASH meeting support the drug's safety profile and durable efficacy. (Also see "*ASH In Review: Roche Refreshes Hematology Portfolio With Robust New Drugs*" - Scrip, 15 Dec, 2017.)

AstraZeneca's Imfinzi & Roche's Tecentriq Gain Ground

Positive data for AstraZeneca PLC's PD-L1 inhibitor *Imfinzi* (durvalumab) in the PACIFIC study set the drug up for an interesting market opportunity in treating stage III non-small cell lung cancer, with a head start over competing PD-1/L1 inhibitors for this indication. (Also see "*AZ Rides PACIFIC Wave To Be First In Early-Stage NSCLC*" - Scrip, 11 Sep, 2017.) Success in this line of therapy took some of the edge off of the failure of the company's Imfinzi/tremelimumab combination to demonstrate a significant improvement in progression-free survival in the MYSTIC study of first-line metastatic lung cancer.

AstraZeneca announced in October that FDA has accepted a filing to cover earlier use, based on PACIFIC data. (Also see "*US Filing For AZ's Imfinzi In Stage III Lung Cancer*" - Pink Sheet, 17 Oct, 2017.) Imfinzi was approved in May for treatment of second-line bladder cancer, a space crowded with others in the same class. AstraZeneca reported sales of only $1m in the third quarter of 2017 and said that it was more focused on launching in lung cancer. (Also see "*PD-1 Earnings Roundup: Buckle Up For A Bumpy Ride*" - Scrip, 15 Nov, 2017.)

The Year's Clinical Trials In Review: Big Misses In 2017

By Lucie Ellis-Taitt

28 Dec 2017

The big clinical trial setbacks hurt. *Scrip* takes a look back at the painful clinical trial failures this year, with Axovant's intepirdine and Celgene's mongersen topping the list.

Read the full article here

Roche's PD-L1 inhibitor *Tecentriq* (atezolizumab) looks well positioned following the release of positive results in December for the drug in combination with the company's VEGF inhibitor *Avastin* (bevacizumab) and chemotherapy in the IMpower150 study in first-line NSCLC. The same month, the company reported that the combination worked well in first-line kidney cancer in the IMmotion151 study.

Roche Powers Forward With First-Line Tecentriq In Advanced NSCLC

By John Davis

07 Dec 2017

(Also see "*Roche's Tecentriq-Avastin Combo Improves PFS In Kidney Cancer Too*" - Scrip, 11 Dec, 2017.) The drug had faced a setback, however, earlier in the year with the failure of Tecentriq to demonstrate a significant benefit for progression-free survival in a Phase III confirmatory study in bladder cancer, the drug's first approved indication. (Also see "*Another Opdivo Disappointment For BMS, This Time In Kidney Cancer*" - Scrip, 15 Aug, 2017.)

The actual data on the clinically meaningful effect on PFS of the triple combination of Tecentriq, Avastin and chemotherapy on previously untreated advanced NSCLC patients in the IMpower150 study have now been presented at a scientific meeting, and suggest that Roche could be a significant competitor in the large NSCLC market in the not too distant future.

Read the full article here

Road Paved For Cannabinoids

Publication of full Phase III results for *GW Pharmaceuticals PLC*'s *Epidiolex* (cannabidiol) for Dravet syndrome, a severe type of pediatric epilepsy, in the *New England Journal of Medicine* in May marked an important step for advancing pharmaceutical-grade cannabinoids as a therapeutic option. (Also see "*GW's Epidiolex Epilepsy Data Paves Way For Cannabinoids*" - Scrip, 25 May, 2017.) The drug is one of over 50 cannabinoids in any stage of development, in a field that is heavily focused on neurological conditions. (Also see "*Cannabinoid Market Snapshot: GW's Epilepsy Success Bodes Well*" - Scrip, 25 Nov, 2016.). GW filed the drug for approval in the US at the end of October and has been raising funds in order to prepare for commercial launch. (Also see "*Interview: GW Pharma Gears Up For Pivotal 2018*" - Scrip, 12 Dec, 2017.) On Dec. 28, the company announced that the FDA accepted the filing and granted it priority review status; the user fee date is June 27, 2018.

Other Notable Wins

- Phase I data for *bluebird bio Inc.*/*Celgene Corp.*'s CAR-T therapy targeting B cell maturation antigen (BCMA) – bb2121 – in relapsed and refractory multiple myeloma, including durable responses, made a big splash at the 2017 ASH meeting. (Also see "*Celgene's CAR-T Leadership Goals Advance At ASH 2017*" - Scrip, 12 Dec, 2017.) Currently approved CAR-T therapies target CD19. The BCMA mechanism is sure to attract many more headlines in coming years.
- Late-stage results for *Tetraphase Pharmaceuticals Inc.*'s eravacycline in complicated intra-abdominal infections (cIAI) and *Paratek Pharmaceuticals Inc.*'s omadacycline in acute bacterial skin and skin structure infections (ABSSSI) bode well for novel antibiotic approvals. (Also see "*Another Antibiotic Success Story as Tetraphase's Eravacycline Meets Goal*" - Scrip, 26 Jul, 2017.)
- *Ablynx NV*'s caplacizumab is poised to become the first drug approved for rare blood clotting disorder, acquired thrombotic thrombocytopenic purpura (aTTP) following positive results in the Phase III HERCULES study, which were presented at the ASH meeting in December,

following a top-line release earlier in 2017. (Also see "*A Star Is Born? HERCULES Data Shine At ASH For Ablynx's Caplacizumab*" - Scrip, 13 Dec, 2017.) Analysts view this drug as a game changer for the condition, based on the reduction in plasma exchanges and hospital stays demonstrated in the study.

- *Sage Therapeutics Inc.* scored an early win with positive Phase II data on the oral depression drug candidate SAGE-217 reported in December. Management expects the positive data could position the GABA-A receptor modulator as a first-line treatment. The company's stock shot up 70% after Sage reported treatment with the drug resulted in a statistically significant mean reduction in Hamilton Rating Scale for Depression (HAM-D) scores of 17.6 points at day 15 versus a mean reduction of 10.7 points for patients who received placebo. (Also see "*Sage's Oral GABA-A Modulator Shows 'Dramatic' Effect On Depression*" - Scrip, 7 Dec, 2017.)