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Spark Therapeutics and Pfizer Announce Data from 15 Participants with Hemophilia B Showing Persistent and Sustained Factor IX Levels with No Serious Adverse Events

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Annualized bleeding rate (ABR) for all 15 participants was reduced by 98 percent, while annualized infusion rate (AIR) was reduced by 99 percent as of the May 7, 2018 data cutoff Range of steady-state factor IX activity level, 12 weeks through 52 weeks of follow up, for first 10 participants and three participants infused with SPK-9001 manufactured using an enhanced process was 14.3 to 76.8 percentand 38.1 to 54.5 percent, respectively

Spark Therapeutics (NASDAQ:ONCE), a fully integrated gene therapy company dedicated to challenging the inevitability of genetic disease, and Pfizer (NYSE:PFE), today announced that, with a cumulative follow-up of more than 18 patient years of observation (5 to 121 weeks), all 15 participants in the ongoing Phase 1/2 clinical trial of investigational SPK-9001 for severe or moderately severe (FIX:C < 2 percent) hemophilia B, had discontinued routine infusions of factor IX concentrates. None of the 15 participants experienced serious adverse events, and there were no thrombotic events or factor IX inhibitors, as of the May 7, 2018 data cutoff. These data will be presented today by Spencer K. Sullivan, M.D., hematologist and clinical investigator, Mississippi Center for Advanced Medicine, at the World Federation of Hemophilia (WFH) World Congress in Glasgow, Scotland, during the "Free Papers: Gene Therapy" session at 10:15 a.m. BST.

"We are pleased to see all 15 participants, notably including the first four participants who have been followed for more than two years, continue to show that a single administration of SPK-9001 has resulted in dramatic reductions in bleeding and factor IX infusions, with no serious adverse events," said Katherine A. High, M.D., president and head of research & development at Spark Therapeutics. "Our commitment to gene therapy research across our hemophilia programs remains steadfast with the goal of developing a novel therapeutic approach with a positive benefit-risk profile that aims to free patients of the need for regular infusions, while eliminating spontaneous bleeding."

Based on individual participant history for the year prior to the study, the overall ABR for all 15 participants was reduced by 98 percent (calculated based on data after week four; 97 percent based on data after infusion) to an annual rate of 0.2 bleeds per participant, compared to an annual rate of 8.9 bleeds before SPK-9001 administration. Only one participant experienced a bleeding event four or more weeks after SPK-9001 infusion.

Overall AIR was reduced by 99 percent (calculated based on data after week four; also 99 percent based on data after infusion) for all 15 participants to an annual rate of 0.9 infusions, compared to an annual rate of 57.2 infusions before infusion. Six participants received factor IX infusions following SPK-9001 administration: two for reported spontaneous bleeds, two prior to surgery, one at the end of the study (discretionary, per protocol) and one for prophylaxis for a minor traumatic non-bleeding event.

As of the May 7, 2018 data cutoff, all 13 participants with at least 12 weeks of follow-up after SPK-9001 infusion, the length of time required to achieve steady-state factor IX activity levels, reached stable factor IX levels of more than 12 percent. The range of steady-state factor IX activity level, beginning at 12 weeks through 52 weeks of follow-up for the first 10 participants infused, was 14.3 to 76.8 percent. For the three participants infused with SPK-9001 manufactured using an enhanced process who reached 12 or more weeks of follow-up, the range of steady-state factor IX activity level was 38.1 to 54.5 percent. The two remaining participants are out 11 and 5 weeks, per the May 7, 2018 data cut-off date.

In this open-label, non-randomized and multicenter Phase 1/2 clinical trial, there have been no serious adverse events, no thrombotic events and no factor IX inhibitors developed, and all 15 participants infused with SPK-9001have discontinued prophylactic clotting factor infusions. Two participants, one having received SPK-9001 manufactured using an enhanced process, reported related adverse events of elevated transaminases and were treated with a tapering course of oral corticosteroids. The events were asymptomatic, and one event has been resolved, as of the May 7, 2018 data cutoff. One additional participant received a tapering course of oral corticosteroids for an increase in liver enzymes (not exceeding the upper limit of normal) temporally associated with falling levels of factor IX activity.

Spark Therapeutics has completed enrollment in the Phase 1/2 clinical trial of SPK-9001 in hemophilia B and expects to complete the transition of the program to Pfizer this summer. Additionally, Spark Therapeutics expects to deliver a batch of drug substance to Pfizer, enabling Pfizer to begin a Phase 3 clinical trial.

About Hemophilia B
Hemophilia, a rare genetic bleeding disorder that causes the blood to take a long time to clot because of a deficiency in one of several blood clotting factors, is almost exclusively found in males. People with hemophilia are at risk for excessive and recurrent bleeding from modest injuries, which have the potential to be life threatening. People with severe hemophilia often bleed spontaneously into their muscles or joints, or rarely into other critical closed spaces such as the intracranial space, where bleeding can be fatal. The incidence of hemophilia B is one in 25,000 male births. People with hemophilia B have a deficiency in clotting factor IX, a specific protein in the blood. Hemophilia B also is called congenital factor IX deficiency or Christmas disease. The current standard of care requires recurrent intravenous infusions of either plasma-derived or recombinant factor IX to control and prevent bleeding episodes. There exists a significant need for novel therapeutics to treat people living with hemophilia.

About the SPK-FIX Program and SPK-9001
SPK-9001 is a novel, investigational vector that contains a bio-engineered adeno-associated virus (AAV) capsid and a codon-optimized, high-activity human factor IX gene enabling endogenous production of factor IX.

Spark Therapeutics and Pfizer entered into a collaboration in December 2014 for the SPK-FIX program, including SPK-9001, under which Spark Therapeutics is responsible for conducting all Phase 1/2 studies for any product candidates, while Pfizer will assume responsibility for pivotal studies, any regulatory activities and potential global commercialization of any products that may result from the collaboration.

About Spark Therapeutics
At Spark Therapeutics, a fully integrated company committed to discovering, developing and delivering gene therapies, we challenge the inevitability of genetic diseases, including blindness, hemophilia and neurodegenerative diseases. We have successfully applied our technology in the first FDA-approved gene therapy in the U.S. for a genetic disease, and currently have three programs in clinical trials, including product candidates that have shown promising early results in patients with hemophilia. At Spark, we see the path to a world where no life is limited by genetic disease. For more information, visit www.sparktx.com, and follow us on Twitter and LinkedIn.

Spark Therapeutics Cautionary note on forward-looking statements
This press release contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, including statements regarding the company's SPK-FIX program. The words "anticipate," "believe," "expect," "intend," "may," "plan," "predict," "will," "would," "could," "should," "continue" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Any forward-looking statements are based on management's current expectations of future events and are subject to a number of risks and uncertainties that could cause actual results to differ materially and adversely from those set forth in, or implied by, such forward-looking statements. These risks and uncertainties include, but are not limited to, the risk that: (i) our lead SPK-FIX product candidate, SPK-9001, may not produce sufficient data in our Phase 1/2 clinical trial to warrant further development; (ii) our overall collaboration with Pfizer may not be successful; (iii) we may not transition the SPK-9001 program and deliver a batch of drug substance to Pfizer when we expect; and (iv) our early preliminary clinical results for our product candidate, SPK-8011, for hemophilia A, may not be sustained or sufficient to support further development. For a discussion of other risks and uncertainties, and other important factors, any of which could cause our actual results to differ from those contained in the forward-looking statements, see the "Risk Factors" section, as well as discussions of potential risks, uncertainties and other important factors, in our Annual Report on Form 10-K, our Quarterly Reports on Form 10-Q and other filings we make with the U.S. Securities and Exchange Commission. All information in this press release is as of the date of the press release, and Spark undertakes no duty to update this information unless required by law.

About Pfizer: Working together for a healthier world®
At Pfizer, we apply science and our global resources to bring therapies to people that extend and significantly improve their lives. We strive to set the standard for quality, safety and value in the discovery, development and manufacture of health care products. Our global portfolio includes medicines and vaccines as well as many of the world's best-known consumer health care products. Every day, Pfizer colleagues work across developed and emerging markets to advance wellness, prevention, treatments and cures that challenge the most feared diseases of our time. Consistent with our responsibility as one of the world's premier innovative biopharmaceutical companies, we collaborate with health care providers, governments and local communities to support and expand access to reliable, affordable health care around the world. For more than 150 years, we have worked to make a difference for all who rely on us. We routinely post information that may be important to investors on our website at www.pfizer.com. In addition, to learn more, please visit us on www.pfizer.com and follow us on Twitter at @Pfizer and @Pfizer_News, LinkedIn, YouTube and like us on Facebook at Facebook.com/Pfizer.

Pfizer Disclosure Notice: The information contained in this release is as of May 22, 2018. Pfizer assumes no obligation to update forward-looking statements contained in this release as the result of new information or future events or developments.

This release contains forward-looking information about SPK-9001 and the SPK-FIX program, including their potential benefits, that involves substantial risks and uncertainties that could cause actual results to differ materially from those expressed or implied by such statements. Risks and uncertainties include, among other things, the uncertainties inherent in research and development, including the ability to meet anticipated clinical study commencement and completion dates as well as the possibility of unfavorable study results, including unfavorable new clinical data and additional analyses of existing clinical data; risks associated with initial data, including the risk that the final results of the Phase 1/2 study for SPK-9001 and/or additional clinical trials may be different from (including less favorable than) the initial data results and may not support further clinical development; the risk that clinical trial data are subject to differing interpretations, and, even when we view data as sufficient to support the safety and/or effectiveness of a product candidate, regulatory authorities may not

share our views and may require additional data or may deny approval altogether; whether regulatory authorities will be satisfied with the design of and results from our clinical studies; whether and when any applications may be filed with regulatory authorities for SPK-9001; whether and when regulatory authorities may approve any such applications, which will depend on the assessment by such regulatory authorities of the benefit-risk profile suggested by the totality of the efficacy and safety information submitted and, if approved, whether SPK-9001 will be commercially successful; decisions by regulatory authorities regarding labeling and other matters that could affect the availability or commercial potential of SPK-9001; and competitive developments.

A further description of risks and uncertainties can be found in Pfizer's Annual Report on Form 10-K for the fiscal year ended December 31, 2017 and in its subsequent reports on Form 10-Q, including in the sections thereof captioned "Risk Factors" and "Forward-Looking Information and Factors That May Affect Future Results," as well as in its subsequent reports on Form 8-K, all of which are filed with the U.S. Securities and Exchange Commission and available at www.sec.gov and www.pfizer.com.

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