



## **Mirum Pharmaceuticals Announces First Patient Enrolled in Phase 2b VISTAS Clinical Study Evaluating Volixibat in Adult Patients With Primary Sclerosing Cholangitis**

January 14, 2021

FOSTER CITY, Calif.--(BUSINESS WIRE)--Jan. 14, 2021-- Mirum Pharmaceuticals, Inc. (Nasdaq: MIRM) today announced that the first patient has been enrolled in Mirum's Phase 2b VISTAS study evaluating volixibat in adult patients with primary sclerosing cholangitis (PSC), an idiopathic chronic cholestatic liver disease characterized by progressive inflammation and destruction of bile ducts often leading to serious liver disease, cancer, and ultimately liver failure. Volixibat, an oral, minimally absorbed medication, is designed to offer a novel approach in the treatment of adult cholestatic diseases by blocking the recycling of bile acids through inhibition of the apical sodium dependent bile acid transporter (ASBT), thereby reducing bile acids systemically and in the liver.

Patients meeting eligibility criteria for the study are randomized to receive volixibat 20 mg twice daily (BID) or 80 mg BID, or placebo for 28 weeks, after which time all patients will receive volixibat through the open-label extension phase of the study.

The primary endpoint will evaluate the change in pruritus from baseline for volixibat versus placebo using the Adult ItchRO tool. Secondary endpoints evaluated will include safety and tolerability, quality of life measures, and serum bile acids. Exploratory endpoints will include assessments of liver fibrosis and other markers of PSC progression.

"This study is an important step forward in evaluating the potential clinical benefit of volixibat in adult patients with primary sclerosing cholangitis," said Christopher Bowlus, MD, chief of gastroenterology and hepatology at UC Davis Health. "There are currently no approved therapies indicated for the treatment of patients with PSC suffering from pruritus, a common and often debilitating symptom of the disease."

"We are excited to initiate the volixibat Phase 2 VISTAS study for patients with primary sclerosing cholangitis," said Ed Tucker, MD, chief medical officer at Mirum. "Our learnings from the maralixibat development program have informed the design of our volixibat study with the hope of alleviating the burdensome effects experienced by patients with PSC."

Mirum has ongoing studies evaluating cholestatic liver diseases in pediatric patients with maralixibat, also an ASBT inhibitor. The company has initiated a rolling NDA submission to the U.S. Food and Drug Administration (FDA) for maralixibat for the treatment of cholestatic pruritus associated with Alagille syndrome, which Mirum expects to complete this quarter. Mirum is planning for a U.S. launch in the second half of 2021, should Mirum receive FDA approval for this indication. Until that time, maralixibat is available to eligible patients in the United States, Canada, Australia and in regions throughout Europe through an Expanded Access Program. Additionally, Mirum submitted a marketing authorization application which was accepted (validated) by the European Medicines Agency for maralixibat for the treatment of patients with progressive familial intrahepatic cholestasis (PFIC), type 2.

### **About Primary Sclerosing Cholangitis**

Primary sclerosing cholangitis (PSC) is a rare, serious, idiopathic chronic cholestatic liver disease characterized by cholestasis, progressive inflammation, and destruction of bile ducts, which may lead to fibrosis, cirrhosis, portal hypertension, cancer, and ultimately liver failure. It is estimated that approximately 29,000 people in the United States and approximately 50,000 people in Europe suffer from PSC with no approved therapies. The underlying etiology of PSC is not completely understood, but it is thought to arise from a combination of genetic and environmental factors. The median age at diagnosis is approximately 35 years, and approximately 70% of PSC patients have inflammatory bowel disease, principally ulcerative colitis. Signs and symptoms of PSC may include, but are not limited to, pruritus, extreme fatigue, jaundice, and abdominal discomfort. The eventual buildup of bile acids from continued bile duct injury and obstruction damages liver cells and is thought to contribute to the progression of liver failure. Complications involving the biliary tree are common and include cholangitis, as well as ductal strictures and gallstones, the latter of which frequently require endoscopic or surgical interventions. PSC also increases the risk of development of malignancies, with cholangiocarcinoma being the most common. PSC is the fifth leading indication for liver transplantation; however, the post-transplant recurrence rate of PSC is up to 25%.

### **About Volixibat**

Volixibat is an oral, minimally absorbed agent designed to selectively inhibit the apical sodium dependent bile acid transporter (ASBT). Volixibat may offer a novel approach in the treatment of adult cholestatic diseases by blocking the recycling of bile acids, through inhibition of ASBT, thereby reducing bile acids systemically and in the liver. Phase 1 and Phase 2 studies of volixibat demonstrated on-target fecal bile acid excretion, a pharmacodynamic marker of ASBT inhibition, in addition to decreases in LDL cholesterol and increases in 7 $\alpha$ C4 which are markers of bile acid synthesis. Volixibat has been evaluated in more than 400 individuals across multiple clinical trials. The most common adverse events reported were mild to moderate gastrointestinal events observed in the volixibat groups.

### **About Mirum**

Mirum Pharmaceuticals, Inc. is a clinical-stage biopharmaceutical company focused on the development and commercialization of a late-stage pipeline of novel therapies for debilitating liver diseases. Mirum's lead product candidate, maralixibat, is an investigational oral drug in development for Alagille syndrome (ALGS), progressive familial intrahepatic cholestasis (PFIC), and biliary atresia. Mirum has initiated a rolling NDA submission for maralixibat for the treatment of cholestatic pruritus in patients with ALGS and expects to complete the submission in the first quarter of 2021. Additionally, Mirum's marketing authorization application for the treatment of pediatric patients with PFIC2 has been accepted for review (validated) by the European Medicines Agency.

Mirum is also developing volixibat, also an oral ASBT inhibitor, to evaluate its potential in treating primary sclerosing cholangitis, intrahepatic cholestasis of pregnancy, and primary biliary cholangitis. For more information, visit [MirumPharma.com](https://www.mirumpharma.com).

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### **Forward Looking Statements**

Statements contained in this press release regarding matters that are not historical facts are “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. Such forward-looking statements include statements regarding, among other things, the conduct and progress of Mirum’s ongoing and planned studies for volixibat, and the regulatory approval path for maralixibat and volixibat. Because such statements are subject to risks and uncertainties, actual results may differ materially from those expressed or implied by such forward-looking statements. Words such as “plans,” “will,” “may,” “expects,” “potential” and similar expressions are intended to identify forward-looking statements. These forward-looking statements are based upon Mirum’s current expectations and involve assumptions that may never materialize or may prove to be incorrect. Actual results could differ materially from those anticipated in such forward-looking statements as a result of various risks and uncertainties, which include, without limitation, risks and uncertainties associated with Mirum’s business in general, the impact of the COVID-19 pandemic, and the other risks described in Mirum’s filings with the Securities and Exchange Commission. All forward-looking statements contained in this press release speak only as of the date on which they were made and are based on management’s assumptions and estimates as of such date. Mirum undertakes no obligation to update such statements to reflect events that occur or circumstances that exist after the date on which they were made, except as required by law.

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