X4 Pharmaceuticals Receives Orphan Drug Designation from European Commission for Mavorixafor for Treatment of WHIM Syndrome

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CAMBRIDGE, Mass.--(BUSINESS WIRE)--Jul. 30, 2019-- X4 Pharmaceuticals, Inc. (Nasdaq: XFOR), a clinical-stage biopharmaceutical company focused on the development of novel therapeutics for the treatment of rare diseases, today announced that the European Commission (EC), based on a favorable recommendation from the European Medicines Agency's (EMA) Committee for Orphan Medicinal Products (COMP), has granted orphan drug designation (ODD) to mavorixafor (X4P-001) for the treatment of WHIM (**W**arts, **H**ypogammaglobulinemia, **I**nfections, and **M**yelokathexis) syndrome, a rare, inherited, primary immunodeficiency disease caused by genetic mutations in the CXCR4 receptor gene. In October 2018, mavorixafor was granted ODD for the treatment of WHIM syndrome by the U.S. Food and Drug Administration. The exact prevalence of WHIM syndrome is unknown, however, in the United States alone there are between 15,000 and 100,000 patients classified as having a primary immunodeficiency disease of unknown origin – of which WHIM syndrome is one.

Mavorixafor is a potential first-in-class, once-daily, oral, small molecule antagonist of chemokine receptor CXCR4 targeting WHIM syndrome. Proof of concept in WHIM patients has been observed with clinically meaningful increases in neutrophil and lymphocyte biomarker counts, as well as a trend of reduction in infection rates and wart burden, and a favorable safety profile. Mavorixafor has been well tolerated in prior early phase clinical studies. X4 Pharmaceuticals recently initiated 4WHIM, a pivotal Phase 3 global clinical trial of mavorixafor for the treatment of WHIM syndrome.

"We are very pleased that the European Commission has granted orphan drug designation for mavorixafor, which we believe has the potential to become a transformative treatment for patients living with WHIM syndrome," said Paula Ragan, PhD, President and Chief Executive Officer of X4 Pharmaceuticals, "We look forward to advancing mavorixafor through our recently commenced Phase 3 pivotal trial and bringing this drug to patients."

ODD in the European Union provides regulatory and financial incentives for companies to develop medicinal therapies to treat serious disorders affecting no more than five in 10,000 people in the European Union. Incentives include eligibility for protocol assistance, access to the European Union's centralized marketing authorization procedure, and marketing exclusivity in the European Union for a period of ten years.

About WHIM Syndrome

WHIM syndrome is a rare, primary immunodeficiency disease caused by genetic mutations in the CXCR4 receptor gene and is named for the characteristic clinical symptoms of the syndrome – **W**arts, **H**ypogammaglobulinemia, **I**nfections, and **M**yelokathexis.[1] Patients with WHIM may experience significant morbidity beginning in early childhood and continuing throughout life with an increased likelihood of various recurrent, potentially life-threatening infections, and may also be susceptible to malignancies such as HPV-related cervical cancer and lymphomas.[1,2,3] The overall cancer risk in patients with WHIM is estimated to be 30 percent by 40 years of age.[4] There are no approved therapies for WHIM, and current standards of care are limited to treatment of acute infections with antibiotics or prevention of infections mainly through immunoglobulin substitution or G-CSF.[5] The exact prevalence of WHIM is unknown, however, in the U.S. alone there are between 15,000 and 100,000 patients classified as having a primary immunodeficiency disease of unknown origin – of which WHIM is one.[6,7,8]

About Mavorixafor

X4 Pharmaceutical's lead product candidate, mavorixafor (X4P-001), is a potential first-in-class, once-daily, oral inhibitor of CXCR4, currently in Phase 3 development for the treatment of WHIM syndrome, a rare, inherited, primary immunodeficiency disease caused by genetic mutations in the CXCR4 receptor gene. Mavorixafor has demonstrated proof of concept in WHIM syndrome in a Phase 2 trial, including clinically meaningful increases in neutrophil and lymphocyte biomarker counts, as well as a trend of reduction in infection rates and wart burden, and a favorable safety profile. Mavorixafor was designated orphan drug status by the U.S. Food and Drug Administration in 2018 and by the European Commission in 2019 for the treatment of WHIM syndrome, and is also in development for Severe Congenital Neutropenia (SCN), Waldenström's macroglobulinemia (WM), and clear cell renal cell carcinoma (ccRCC).

About X4 Pharmaceuticals

X4 Pharmaceuticals is developing novel therapeutics designed to improve immune cell trafficking to treat rare diseases, including primary immunodeficiencies and certain cancers. The company's oral small molecule drug candidates antagonize the CXCR4 pathway, which plays a central role in immune surveillance. X4's most advanced product candidate, mavorixafor (X4P-001), is in a global Phase 3 pivotal trial in patients with WHIM syndrome, a rare, inherited, primary immunodeficiency disease, and is currently also under investigation in combination with axitinib in the Phase 2a portion of an open-label Phase 1/2 clinical trial in clear cell renal cell carcinoma (ccRCC). X4 is also planning to commence clinical trials of mavorixafor in Severe Congenital Neutropenia (SCN) and Waldenström's macroglobulinemia (WM) in 2019. X4 was founded and is led by a team with extensive biopharmaceutical product development and commercialization expertise and is committed to advancing the development of innovative medicines on behalf of patients with limited treatment options. X4 is a global company that is headquartered in Cambridge, Massachusetts with research offices based in Vienna, Austria. For more information, please visit www.x4pharma.com.

Forward-Looking Statements

This press release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, as amended. These statements may be identified by the words “may,” “will,” “could,” “would,” “should,” “expect,” “plan,” “anticipate,” “intend,” “believe,” “estimate,” “predict,” “project,” “potential,” “continue,” “target” or other similar terms or expressions that concern X4's expectations, strategy, plans or intentions. Forward-looking statements include, but are not limited to, statements regarding the clinical development of mavorixafor (X4P-001) or any of X4's other product candidates or programs, including the timing and receipt of results from the Phase 3 clinical trial of mavorixafor for the treatment of patients with WHIM syndrome. These statements are subject to various risks and uncertainties, actual results could differ materially from those projected and X4 cautions investors not to place undue reliance on the forward-looking statements in this press release. These risks and uncertainties include, without limitation, the risk that trials and studies may be delayed and may not have satisfactory outcomes, potential adverse effects arising from the testing or use of mavorixafor or other product candidates, the risk that costs required to develop mavorixafor or other product candidates or to expand X4’s operations will be higher than anticipated. Any forward-looking statements in this press release are based on management's current expectations and beliefs and are subject to a number of risks, uncertainties and important factors that may cause actual events or results to differ materially from those expressed or implied by any forward-looking statements contained in this press release, including, without limitation, the risks and uncertainties described in the section entitled “Risk Factors” in X4’s most recent Annual Report on Form 10-K filed with the Securities and Exchange Commission (SEC), as updated by X4’s Current Report on Form 8-K filed with the SEC on April 11, 2019, and in other filings X4 makes with the SEC from time to time. X4 undertakes no obligation to update the information contained in this press release to reflect new events or circumstances, except as required by law.

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[1]Primary Immunodeficiency Foundation: https://primaryimmune.org/disease/whim-syndrome

[2] McDermott, D and Murphy P, WHIM syndrome: Immunopathogenesis, treatment and cure strategies. Immunological Reviews. 2019;287: 91-102.

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[5] Badolato R, et al. How I treat warts, hypogammaglobulinemia, infections, and myelokathexis syndrome. Blood. 2017 130: 2491-2498.

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