pulmatrix

OVERVIEW: We are a clinical stage biopharmaceutical company developing inhaled therapies for the treatment of pulmonary diseases using our patented inhaled dry powder technology, iSPERS®. Our proprietary product pipeline is focused on advancing treatments for rare diseases, including PUR1900, an inhaled anti-fungal for treatement of fungal infections for patients with lung disease. In addition, we are pursuing opportunities in major pulmonary diseases like chronic obstructive pulmonary disease (COPD) and idiopathic pulmonary fibrosis (IPF), including PUR0200 a Phase 2 clinical stage branded generic version of the COPD drug Spiriva® HandiHaler® and most recently with the addition of a portfolio of novel inhaled narrow spectrum kinase inhibitors anti-inflammatories (PUR1800 and PUR5700) from RespiVert, a wholly ownded subsidiary of Janssen Biotech, Inc.

NASDAQ: PULM

PUR0200: Bronchodilator for COPD

PUR0200 is a once-daily, inhalable iSPERSE® reformulation of tiotropium bromide for COPD patients. PUR0200 is under development as a substitutable product for Spiriva® HandiHaler® in the European Union (EU) and as a branded alternative to Spiriva HandiHaler in the US.

In Europe, development follows the hybrid pathway for orally inhaled products based on PK bioequivalence with a targeted pivotal trial in 2018. In the US, PUR0200 is following a 505(b)(2) path.

PUR1900: Inhaled Anti-Fungal for Asthma and CF

PUR1900 is a proprietary inhaled anti-fungal compound being developed to treat fungal infections for patients with lung disease like severe asthma and cystic fibrosis.

PUR1900 is an iSPERSE formulation of Itraconazole, an oral antifungal approved for treatment of pulmonary fungal infections. PUR1900 iSPERSE formulation allows for a high therapeutic dose delivery directly to the lung while minimizing the systemic side effects and drug to drug interactions that are common among oral Itraconazole and other oral azoles therapies.

Patients with severe asthma and CF are afflicted with ABPA, a complex hypersensitivity reaction that occurs in response to colonization of the airways with *Aspergillus fumigatus*. It is estimated that 2.5% of asthmatics and nearly 15% of patients with cystic fibrosis CF suffer from ABPA, which is associated with severe exacerbations and poor long term outcomes. PUR1900 is the first inhaled 505(b)(2) anti-fungal product candidate, targeting the high unmet medical need for severe asthma and CF.

PUR1800: Inhaled Narrow-Spectrum Kinase Inhibitor

PUR1800 is a narrow-spectrum kinase inhibitor (NSKI) recently in-licensed from Respivert, a subsidiary of Janssen Pharmaceuticals. NSKIs inhibit steroid resistant inflammatory processes induced by a variety of stimuli including cytokines, pathogens and free radical stressors such as cigarette smoke. PUR1800 has completed a Phase 2a clinical trial in COPD patients and will be reformulated into an iSPERSE formulation that can be used as a treatment for acute exacerbations of COPD (AECOPD). Acute exacerbations cause significant morbidity and mortality in COPD and are currently poorly managed with existing therapies.

PUR5700: Inhaled Narrow-Spectrum Kinase Inhibitor

PUR5700 is a second NSKI in preclinical development. Preclinical data demonstrate the potential of PUR5700 as a novel anti-inflammatory for IPF that could also have therapeutic potential in COPD to prevent or treat AECOPD and to treat severe asthma.

Development Pipeline

Product	Class	Indication	Development Phase	Addressable Market
PUR0200-US	LAMA	COPD	Phase 2	60M patients WW
PUR0200-EU	LAMA	COPD	Pivotal PK Bioequivalence	
PUR1900	Anti-fungal	ABPA Asthma	Phase 1	5M patients
		ABPA Cystic Fibrosis		>20K patients
PUR1800	Kinase Inhibitor	COPD	Phase 2	60M patients WW
PUR5700	Kinase Inhibitor	IPF, COPD, & Asthma	Preclinical	IPF – 200K US COPD – 60M WW Asthma – 235M WW

iSPERSE® Technology Platform

Our iSPERSE technology is able to solve significant limitations of other inhaled technologies available today, such as nebulizers, metered dose inhalers, and conventional lactose blend dry powder inhalers. iSPERSE particles are engineered to be small, dense, and easily dispersible upon inhalation, thereby delivering the drugs more efficiently to the airways. Importantly, unlike other traditional inhalation technologies, iSPERSE™ is also flow rate independent, which should provide reliable dose delivery across patient populations regardless of the status of patient lung function.

iSPERSE has been shown to enable a broad range of potential inhaled therapies that lactose blend dry powders can't support. The iSPERSE technology is applicable across a broad range of therapeutic approaches; small molecules including multi-drug combos, peptides, proteins, and antibodies can all be formulated in iSPERSE. Therefore Pulmatrix can consider a myriad of in- and out-license opportunities to add to our pipeline.

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