Boosting the Innate Immune System To Treat Respiratory Infections

Corporate Overview
October 2017
Company Summary

Clinical stage respiratory disease therapeutics company

Lead program: PUL-042
- Inhaled, broad-spectrum compound shown to have superior efficacy in animal models, safety & convenience
- Well-tolerated in two Phase 1 trials (n=49 subjects)
- Composition, method of use patent claims issued on combination of TLR 2/6 & 9 agonists

Respiratory pipeline across multiple indications
- Reduction of exacerbations in COPD, treatment of influenza and treatment of pneumonia in neutropenic subjects

Experienced team in pulmonary/immunology drug development and business management

Currently raising Series B funds to advance through Phase 2a/POC
Poised for Clinical Proof of Concept

Next Step: Proof-of-Concept Human Viral Challenge

Phase I Completed

49 Subjects
Single and Multiple Doses
Well Tolerated

Clear value inflexion point
Fully funded by $12M Series B
Success would create optionality:
• Enable multiple programs
• Position for strategic partnership/exit
• Potential path to IPO

POC Will Support Clinical Development Opportunities:

- COPD exacerbations
- Pneumonia in Cancer
- Influenza
Led by Team With Deep Domain Expertise …

**Dr. Nestor Molfino**, CEO
Dr. Molfino is a board certified Respiratory Medicine Specialist and scientist with over 20 years development experience. Past executive roles included VP and Respiratory Therapeutic Head at MedImmune Inc. (AstraZeneca Biologics) and CMO, at KaloBios, publicly listed biotech company. Dr. Molfino received a Master’s degree in Molecular and Cell Biology from the University of Toronto. He holds a Medical degree from Universidad Nacional de Rosario in Argentina. After completing his clinical training, he went to University of Toronto for a postdoctoral fellow and stayed as Assistant Professor.

**Dr. Brenton Scott**, President & COO
Dr. Scott is a co-founder of the company. His academic experience has focused on vesicular traffic, airway inflammation and infection. He serves as the PI on multiple grant awards, including the CPRIT and TETF awards from the State of Texas and seven SBIR awards. He received his PhD in Biochemistry and Cell Biology from Rice University and his MBA from University of Houston.

**Dr. John Schaumberg**, Head, Clinical Operations
Dr. Schaumberg has more than 30 years of drug development expertise, including experience with global pharmaceutical organizations, biotechnology companies and clinical research organizations. His past roles include Vice President level positions in Biotech as Senior Vice President, Clinical Operations of Agennix AG as well as Vice President level positions in the clinical research organizations PRA International and Inveresk.

**Dr. Diane Markesich**, Director of Preclinical Research
Dr. Markesich PhD joined Pulmotect in March 2013. She has extensive experience in directing discovery and translational research for drug development including as Associate Director of Target Validation at Lexicon Pharmaceuticals. Dr. Markesich received her Ph.D. Rice University and did her postdoctoral fellowship at the Baylor College of Medicine.
… And Supported By Experienced Board and Advisory Board

<table>
<thead>
<tr>
<th>BOARD OF DIRECTORS</th>
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<tbody>
<tr>
<td>Leo Linbeck, III</td>
<td>Chairman; CEO, Aquinas Companies, LLC</td>
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<tr>
<td>Mark Benedyk, PhD</td>
<td>CEO, Telephus</td>
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<tr>
<td>Bruce D. Given, MD</td>
<td>CEO, Leonardo Biosystems; COO, Arrowhead Research</td>
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<tr>
<td>Magnus Höök, PhD</td>
<td>Regents Professor, Texas A&amp;M, &amp; Founder</td>
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<tr>
<td>Atul Varadhachary, MD, PhD</td>
<td>Managing Partner, Fannin Innovation Studio</td>
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<tr>
<td>Mark Worscheh</td>
<td>EVP, Aquinas Companies, LLC</td>
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<tr>
<th>SCIENTIFIC ADVISORY BOARD</th>
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<tbody>
<tr>
<td>Burton Dickey, MD</td>
<td>Founder; Chair of Pulmonary at MD Anderson</td>
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<tr>
<td>Gerard J. Criner, MD</td>
<td>Chair &amp; Professor, Thoracic Medicine, Temple University</td>
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<tr>
<td>Steven Reed, PhD</td>
<td>President, CEO &amp; Founder, IDRI</td>
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<tr>
<td>Sebastian Johnston, PhD</td>
<td>Professor of Respiratory Medicine, NHLI</td>
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<tr>
<td>Tim Higenbottam, MD</td>
<td>VP of Pharma Medicine, Royal College of Physicians</td>
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<tr>
<td>Scott E. Evans, MD</td>
<td>Associate Professor, Pulmonary Medicine, MD Anderson</td>
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The molecule
- PUL-042 is a patented combination of Pam2 & ODN, TLR 2/6 & 9 agonists

Our approach
- TLRs recognize pathogens and activate the body’s innate immune system
- By boosting lung epithelial cell immunity, PUL-042 better protects the host from infections
- This single therapeutic has demonstrated protection against each major class of pathogen (bacterial, fungal & viral), even in the presence of immunosuppression

Evans SE, Annu Rev Physiol 72:413, 2010
PUL-042 Prevents Infections

Hosts do not die... ...but the pathogen does

S. Pnuemoniae Challenged Mice

Duggan JM, J Immunol 186:5916, 2011
**Broad Spectrum Activity**

**H3N2 Influenza Challenge**
- Mouse Survival
- Survival (%)
- Vehicle Only
- PUL-042 -72 h
- PUL-042 +24 h
- PUL-042 +24 h, +72 h
- PUL-042 +48 h

**P. aeruginosa Challenge**
- Mouse Survival
- Survival (%)
- PUL-042 Day +1
- PUL-042 +24 h, +72 h
- PUL-042 +48 h

**H1N1 Influenza Challenge**
- Mouse Survival
- Vehicle Only
- PUL-042 -72 h
- PUL-042 -12 h
- PUL-042 +12 h

**Parainfluenza Virus Replication**
- Guinea Pig Lung Titers
- Tracheal
- Nasal
- PBS
- PUL-042 -24 h
- PUL-042 -24 h

**RSV in vitro Expression**
- RSV N Gene Expression Level
- MOI 0.1
- MOI 1.0
- 16X
- 8X
- 4X
- Vehicle

**H7N9 Pandemic Influenza**
- Mouse Survival
- Survival (%)
- Vehicle Only
- PUL-042 -12 h
- PUL-042 +12 h

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Drake, MG, AJRCMB 48:6, 2013
Duggan JM, J Immunol 186:5916, 2011
## Preclinical Activity Summary

### Prophylaxis

<table>
<thead>
<tr>
<th>Infection</th>
<th>Species and dosing</th>
<th>Survival</th>
</tr>
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<tbody>
<tr>
<td>Anthrax spores</td>
<td>Mice (n=10) Rabbits (n=6)</td>
<td>100% vs nil</td>
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<tr>
<td></td>
<td></td>
<td>30% vs. nil</td>
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<tr>
<td>SARS-CoV</td>
<td>Mice (n=10)</td>
<td>100% vs nil</td>
</tr>
<tr>
<td>Influenza A (H1N1 CA/2009)</td>
<td>Mice (n=15) SD and MD</td>
<td>100% vs nil</td>
</tr>
<tr>
<td>Influenza B (Lee)</td>
<td>Mice (n = 15)</td>
<td>100% vs nil</td>
</tr>
<tr>
<td>S. Pneumoniae</td>
<td>Mice (n= 10)</td>
<td>100% vs 15%</td>
</tr>
<tr>
<td>P. aeruginosa</td>
<td>Mice (n=8)</td>
<td>100% vs 25%</td>
</tr>
<tr>
<td>HSV-1 orofacial</td>
<td>Mice (n= 10)</td>
<td>40% vs 10%</td>
</tr>
<tr>
<td>HSV-2 vaginal</td>
<td>Mice (n= 10)</td>
<td>88% vs 63%</td>
</tr>
<tr>
<td>Sendai virus (PIV)</td>
<td>Guinea pigs, mice</td>
<td>Decreased viral loads</td>
</tr>
<tr>
<td>Influenza H7N9 (pandemic model)</td>
<td>Mice (nose only exposure to aerosol)</td>
<td>80% vs 20%</td>
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### Treatment

<table>
<thead>
<tr>
<th>Infection</th>
<th>Species and dosing</th>
<th>Survival</th>
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<tbody>
<tr>
<td>Influenza A (H3N2)</td>
<td>Mice (n= 15) w/ ribavirin</td>
<td>95% vs. nil</td>
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<td></td>
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<td>D1 vs D2 vs D3 =~ 50% Vs. nil</td>
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<tr>
<td>Influenza A (H3N2)</td>
<td>Mice (n=45) SD w/oseltamivir</td>
<td>D1+3= 85%, D2+5 = 75%, D4+66 = 45% vs. nil</td>
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<td>D1 +D3 70% vs. 5%</td>
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<tr>
<td>Influenza A (H3N2)</td>
<td>Mice (n=45) MD w/oseltamivir</td>
<td>D1+D3 70% vs. nil</td>
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<td></td>
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<td>100% vs. nil</td>
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<tr>
<td>Influenza A (H1N1 CA/4/2009)</td>
<td>Mice (n=15) MD w/oseltamivir</td>
<td>D1+D3 70% vs. nil</td>
</tr>
<tr>
<td>Influenza A (H1N1 A/PR/8/34)</td>
<td>Mice (n=15) MD w/oseltamivir</td>
<td>100% vs. nil</td>
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<tr>
<td>Influenza B (Lee)</td>
<td>Mice (n=15) w/oseltamivir</td>
<td>60% vs 20%</td>
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<td></td>
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<td>D1</td>
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<td>86% vs 12%</td>
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<td>D2</td>
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<td>78% vs 12%</td>
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<td>D1+D3</td>
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<td>92% vs 20%</td>
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<td>90% vs. 30%</td>
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Two Phase 1 Studies Show Safety & Tolerability

Single and multiple dose trials, 49 subjects dosed

Safety findings

- Sporadic mild respiratory AEs - cough, increased secretions and/or irritations
- Two subjects administered albuterol sulfate as treatment for mild respiratory symptoms

No changes in pulse oximetry

Forced Expiratory Volume in 1 second (FEV$_1$) shows a small dose-related decrease

Circulating neutrophils show a small dose-related increase, within normal range

Maximum tolerated dose (MTD) determined
Pulmotect Has Achieved A Number of Critical Milestones

**Completed Milestones**
- ✓ Novel IP published in 8+ countries
- ✓ Favorable “drug-like” properties
- ✓ Mass producible compound development complete and stable (3 yr. stability)
- ✓ Acceptable tolerability in phase 1 studies
- ✓ Human PK consistent with 2x/week inhaled administration
- ✓ Finalized next-stage study designs with Scientific Advisory Board

**Next Steps**
- ✗ Phase 2a dose-ranging in 2018 - viral challenge PoC in 2019
- ✗ File CF orphan indication
- ✗ Continue development of follow-on compound(s)
- ✗ Consider pneumonia in cancer patients and/or influenza indications, if government funded
Entering Clinical POC Study

2017
Dose-ranging in smokers

2018
Viral challenge in smokers

2019
PUL-043 lead optimization and new inhaled combination

2020
Potential Exit:
- Strategic Partner
- IPO
- Series C

Phase Ib in BMT/leukemia

Phase II in neutropenic patients

Phase II Severe Influenza

Pneumonia

COPD

Influenza

Influenza

COPD