INVESTMENT HIGHLIGHTS

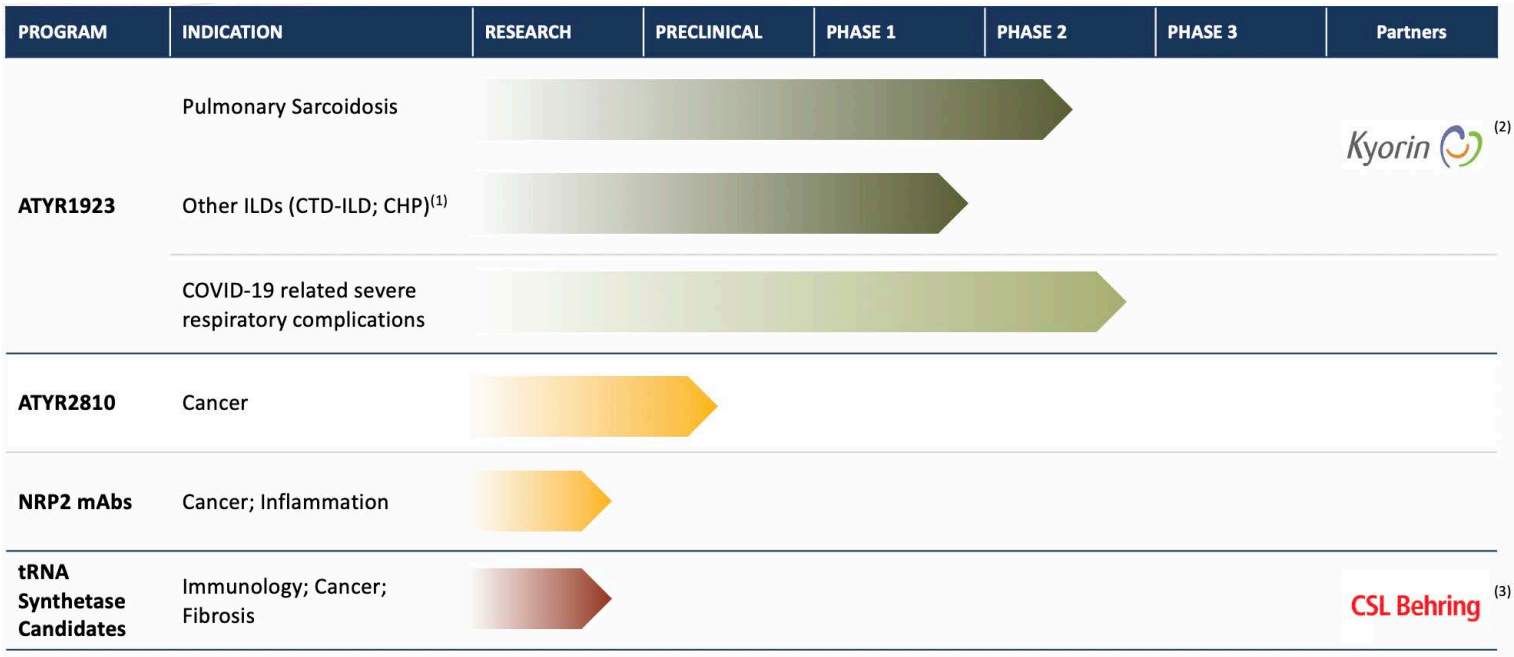
- Mission: develop a new class of medicine based on proprietary biology
- Lead product candidate, ATYR1923, is a potential first-in-class immunomodulator for the treatment of severe inflammatory lung disease
  - Phase 2 trial of ATYR1923 in COVID-19 patients with severe respiratory complications
  - Phase 1b/2a trial of ATYR1923 in pulmonary sarcoidosis, a major form of interstitial lung disease (ILD)
  - Phase 1 trial of ATYR1923 in healthy volunteers in Japan
  - Collaboration with Kyorin Pharmaceutical for ILDs in Japan with total deal value of up to $175m
- Lead IND candidate, ATYR2810, is fully humanized monoclonal antibody targeting distinct and specific domains of NRP2 in preclinical development for cancer
- Discovery pipeline focused on NRP2 antibodies for cancer and inflammation and new tRNA synthetase candidates for immunology, cancer and inflammation
  - Ongoing research collaborations with leading biopharmaceutical companies (CSL Behring) and academia (Boston Children's, Medical University of South Carolina, University of Massachusetts, University of Nebraska Medical Center)

Ticker	LIFE (NASDAQ)
Cash[1]	$36.1 million
Common Shares[1]	9,990,962
Headquarters	San Diego
Year-end	December 31st

[1]As of September 30, 2020

For more information contact
investorrelations@atyrpharma.com

PIPELINE

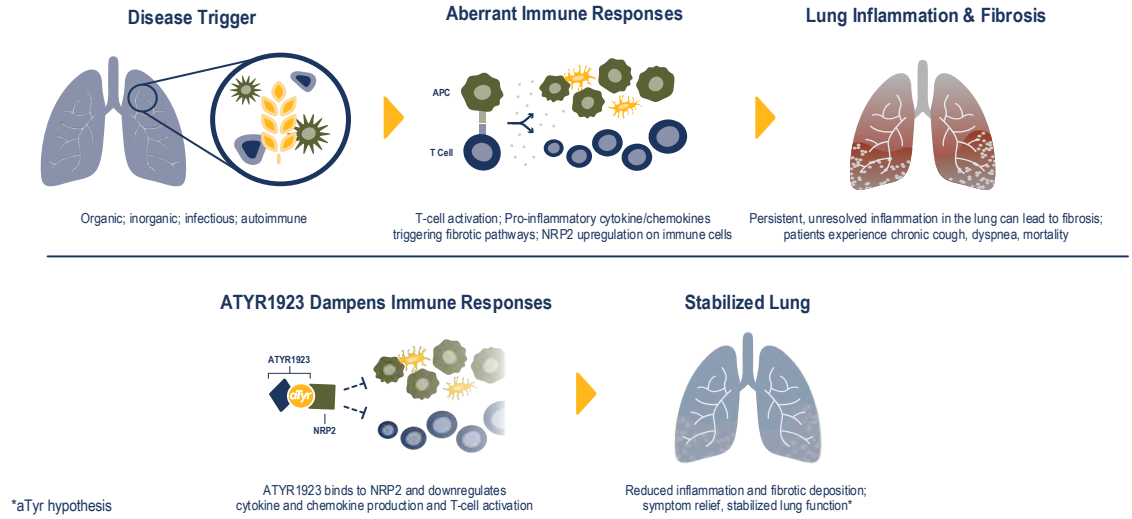


(1) CTD-ILD: connective tissue disease-related ILD (e.g. Scleroderma-related ILD); CHP: chronic hypersensitivity pneumonitis
(2) Kyorin partnership for ILD in Japan; Phase 1 study in Japanese healthy volunteers enrolling
(3) CSL partnership for up to 4 tRNA synthetases

ATYR1923: POTENTIAL FIRST-IN-CLASS CANDIDATE FOR INFLAMMATORY LUNG DISEASE

- Downregulates inflammatory and pro-fibrotic cytokines and chemokines via NRP2 receptor
- Demonstrated anti-inflammatory and anti-fibrotic effect in multiple animal models of ILD
- Completed Phase 1 study in 36 healthy volunteers, generally well-tolerated with PK supporting once-monthly dosing; safety profile consistent in interim analysis from Phase 1b/2a study in pulmonary sarcoidosis patients and Phase 2 study in COVID-19 patients
- Completed enrollment in Phase 2 study in 32 COVID-19 patients with severe respiratory complications receiving a single dose of either 1.0 mg/kg or 3.0 mg/kg ATYR1923 or placebo
- Currently enrolling Phase 1b/2a study in 36 patients with pulmonary sarcoidosis dosed at levels of 1.0 mg/kg, 3.0 mg/kg, and 5.0 mg/kg ATYR1923 or placebo dosed every month for six months
- Currently enrolling Phase 1 study to evaluate the safety, pharmacokinetics and immunogenicity of ATYR1923 in 32 Japanese healthy volunteers

ATYR1923 MOA IN INFLAMMATORY LUNG DISEASE



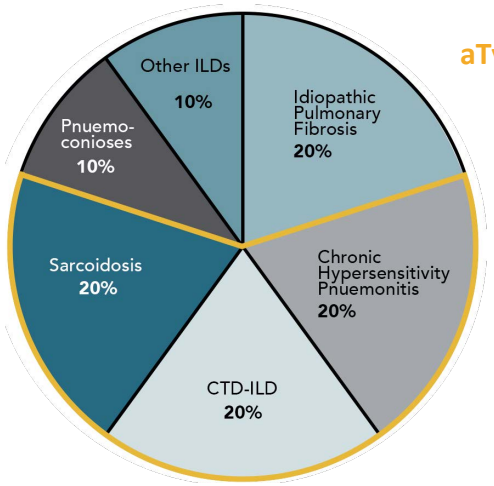
FIRST INDICATION: PULMONARY SARCOIDOSIS

- Inflammatory disease of unknown etiology characterized by the formulation of granulomas (clumps of immune cells), primarily T-cell driven
- Pulmonary sarcoidosis and occurs in ~90% of patients
- Treatment options are limited with associated toxicity: Corticosteroids, cytotoxic immunosuppressants, TNF inhibitors

MARKET OPPORTUNITY IN ILD

- >200 types of ILD; 4 major types comprise 80% of patients
- Limited standard of care with substantial morbidity and mortality
- aTyr focused on 3 most inflammatory types: 500-600k U.S. patients[2]; ~3m globally
- $2-3b global market opportunity[3]

Relative Distribution of ILDs in the U.S. [1]



(1) Lederer/Martinez. NEJM 2018
(2) All ILDs individually have potential for orphan status
(3) aTyr estimates for ATYR1923 in Pulmonary Sarcoidosis, CHP, CTD-ILD; excludes IPF