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Global Leader in Allogeneic Cellular Medicines for Inflammatory Diseases

ASX Investor Day

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ASX: MSB; Nasdaq: MESO

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FY2026: Highlights for the Year and Delivery of Major Milestones

Successful first year for U.S. commercial launch of RYONCIL

- FY2026 net revenue US$115M
- Gross profit on total sales, excluding amortization expense, was US$110M



Major milestones achieved

- ✓ Completed 350 patients treated in the Phase 3 trial for the blockbuster chronic low back pain (CLBP) indication
- ✓ Alignment with FDA on filing for approval in end-stage heart failure indication
- ✓ Registration trial for label extension of RYONCIL into adults with SR-aGvHD has commenced and is currently enrolling patients, targeting 40 sites across the U.S.
- ✓ Pediatric Duchenne's Phase 3 IND cleared by FDA
- ✓ Entered into a US$125.0 million five-year non-dilutive credit-line facility, consolidating and retiring two higher cost facilities

SR-aGvHD = Steroid-Refractory Acute Graft versus Host Disease IND = Investigational New Drug | MSC = Mesenchymal Stromal Cell | FDA = United States Food & Drug Administration

Our ‘MOAT’ – Our Market Leadership Position

- ✓ Global IP portfolio >1,100 patents and patent applications provide protection through >2044
- ✓ Dominant IP underpins a scalable commercial business model for cell therapy products
- ✓ First mover advantage – RYONCIL is the first and only MSC approved by FDA
- ✓ Leverage FDA Guidance to obtain label extensions for RYONCIL in other indications
- ✓ Completed large, US-based, randomized clinical trials which provide evidence of efficacy across multiple platforms
- ✓ Leader in cell manufacturing with IP protection, significant know-how advantage, demonstrated FDA alignment, scale-up capacity, and ability to leverage across many products
- ✓ Next gen technology leadership to enhance tissue-homing characteristics and achieve even greater efficacy in inflammatory diseases
- ✓ Executive leadership with proven capability to bring cutting-edge cell therapy technology to market

IP = Intellectual Property | MSC = Mesenchymal Stromal Cell | FDA = United States Food & Drug Administration

Mesoblast First-In-Class Leader in Allogeneic Cellular Therapies



Ryoncil® Only FDA Approved MSC, Successful First US Launch

Net revenue US$115M in FY2026 – first full year post launch

Highly profitable single product on stand-alone basis

Opportunities in adult aGvHD and other severe pediatric inflammatory diseases, such as Duchenne muscular dystrophy, with similar MOA



Commercial Capability

Infrastructure to support product launches across multiple indications

Sales & market access team focused on transplant centers and specialists

- >50 centers onboarded
- 98% US lives covered
- J-code obtained



Rexlemesteocel-L the Engine for Blockbuster Opportunities

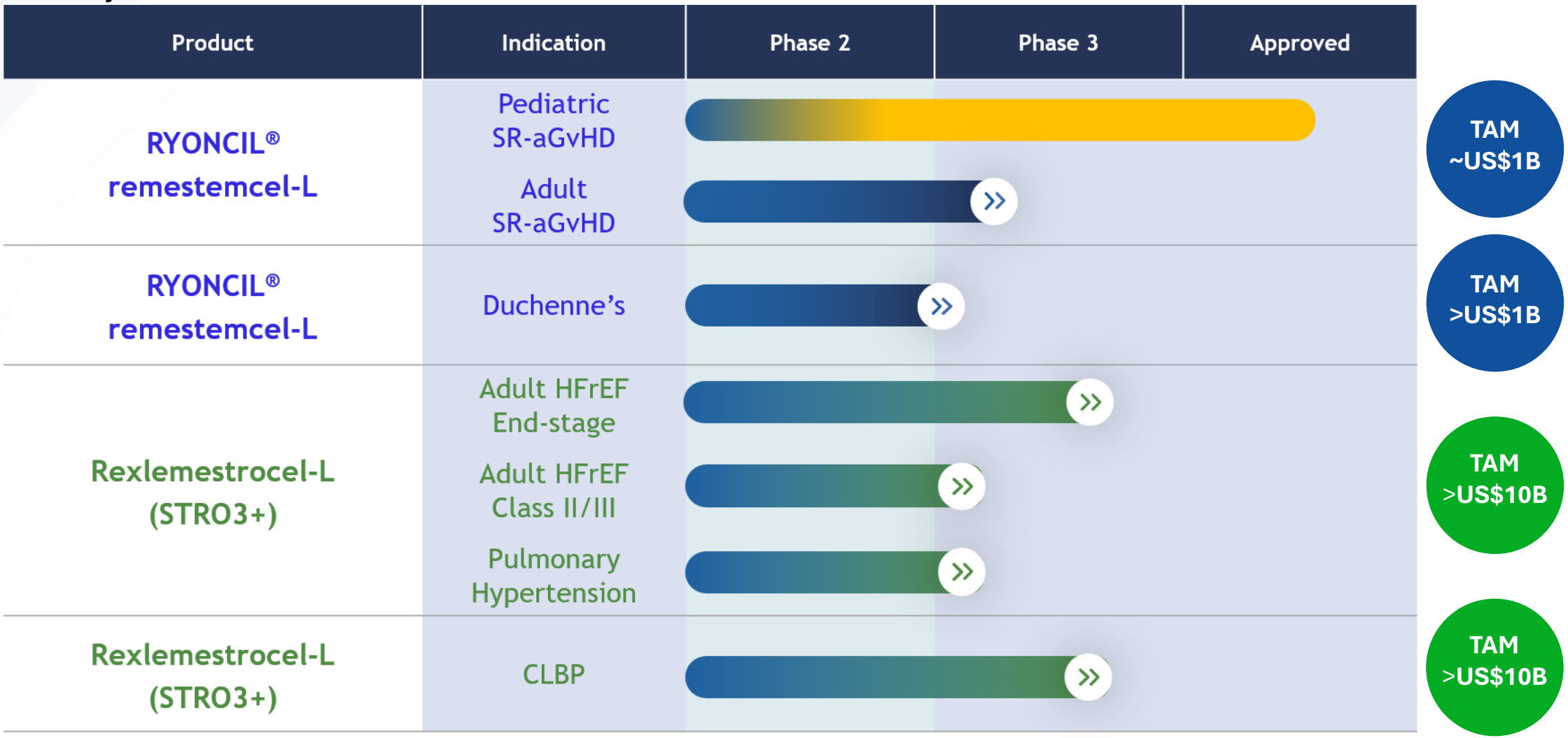
Rexlemestrocel-L provides late-stage opportunities to disrupt massive pain and cardiovascular markets with substantial unmet medical needs

- Chronic low back pain
- Pulmonary hypertension in left heart failure

aGvHD = Acute Graft-versus–Host Disease | MSC = Mesenchymal Stromal Cell | FDA = United States Food & Drug Administration | MOA = Mechanism of Action

Mesoblast Worldwide Leader Allogeneic Mesenchymal Stromal Cell Portfolio

Assets Wholly Owned and Unencumbered in U.S. Markets



This chart is figurative and does not purport to show individual trial progress within a clinical program

Notes:

- JCR Pharmaceuticals Co., Ltd. (JCR), has the right to develop mesenchymal stromal cells (MSCs) in certain fields for the Japanese market, including for the treatment of hematological malignancies, such as Graft vs Host Disease, and for hypoxic ischemic encephalopathy (HIE).
- Grünenthal has an exclusive license to develop and commercialize rexlemestrocel-L for chronic low back pain in Europe and Latin America/Caribbean.
- Tasly Pharmaceuticals has exclusive rights for rexlemestrocel-L for the treatment or prevention of chronic heart failure in China.

SR-aGvHD = Steroid-Refractory Acute Graft versus Host Disease | HFrEF = Heart Failure with Reduced Ejection Fraction | CLBP = Chronic Low Back Pain | TAM = Total Addressable Market



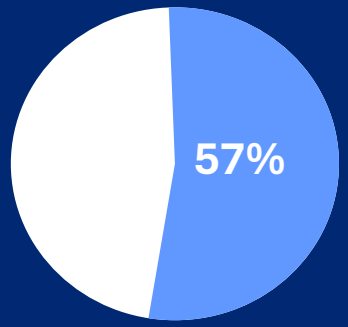
RYONCIL®

Steroid-Refractory Acute Graft Versus Host Disease (SR-aGVHD)

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Potential Market for RYONCIL Label Extension as Part of Second-line Regimen Combined with Ruxolitinib in Adults with Grade III/IV aGvHD

- >2,000 adults annually in U.S. with SR-aGvHD of which ~50% have Grade III/IV disease
- Registration trial: 180 Grade III/IV SR-aGvHD adults randomized 1:1 to ruxolitinib vs ruxolitinib + RYONCIL
- Primary endpoint Day 28 overall response; secondary endpoint Day 180 overall survival
- Targeting ~40 U.S. centers, representing >50% of annual allo transplants performed
- Expected duration 18-24 months, with interim analysis for potential early success



Interim analysis planned for early success when first 102 patients (57% enrolled) have reached Day 28 (primary endpoint)

Analysis expected Q4 CY2027

SR-aGvHD = Steroid-Refractory Acute Graft versus Host Disease



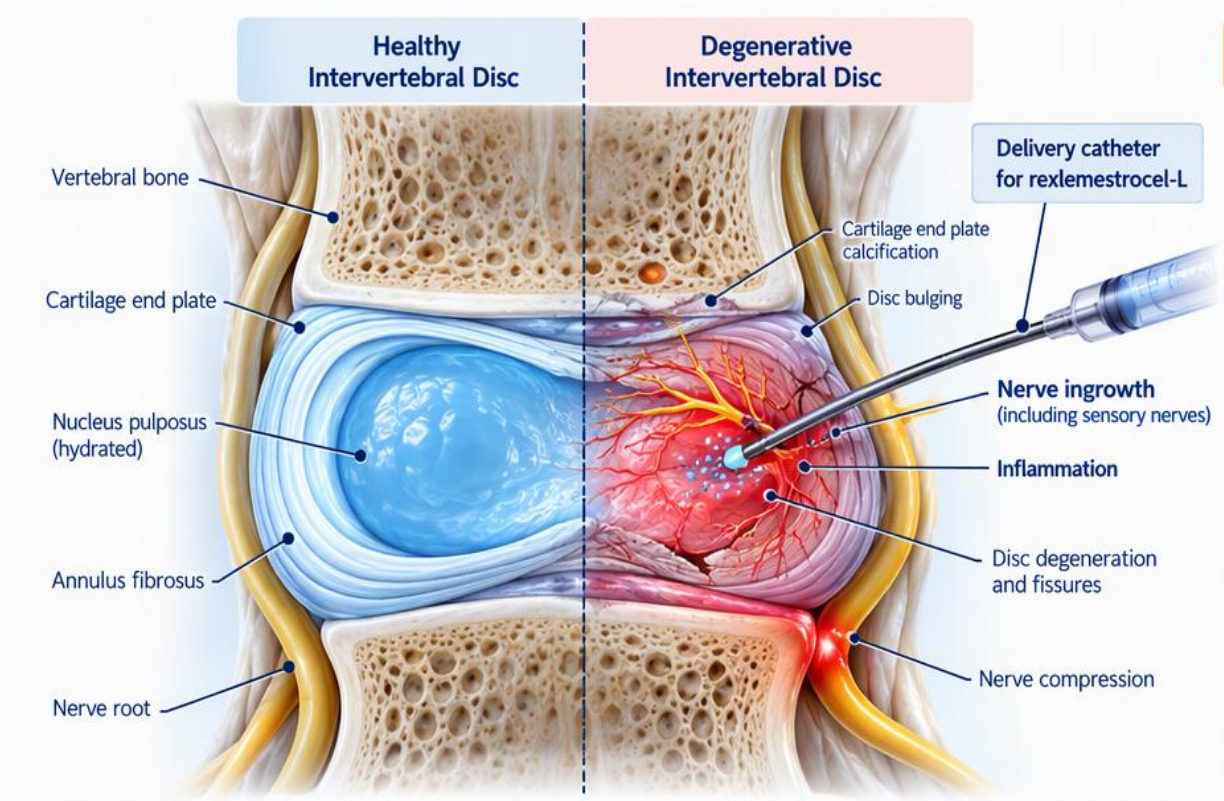
Rexlemestrocel-L

Chronic Low Back Pain due to Degenerative Disc Disease (CLBP)

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Phase 3 trial to Reduce Inflammation & Pain in Degenerative Disc Disease

Targeted, minimally invasive delivery of rexlemestrocel-L to the degenerated disc



Healthy disc
- Hydrated nucleus
- Intact annulus
- Minimal nerve ingrowth

Degenerated disc
- Loss of disc height & hydration
- Inflammation
- Nerve & blood vessel ingrowth
- Associated with chronic pain

Major Milestones to Commercial Launch

1. P3 trial 350 patients fully enrolled
2. Primary endpoint: 12-month pain reduction
   Secondary endpoint: improved function
3. Trial readout H2 CY2027followed by BLA filing
4. Potential approval CY2028

McCann MR and Seguin CA. J. Dev. Biol. 2016, 4(1), 3.

P3 = Phase 3 | BLA = Biologics License Application

The Patient Treatment Journey

~7M US patients have moderate / severe DDD within 5 years of diagnosis that is refractory to medical therapies including opioids

Rexlemestrocel-L targeting moderate-to-severe CLBP

Conservative Treatments

- NSAIDs
- Physical therapy
- Chiropractic treatments
- Acupuncture
- Anticonvulsants (e.g., gabapentin)

Opioid Analgesics

- Weak opioid analgesics (e.g., tramadol)
- Strong opioid analgesics (e.g., oxycodone)

Interventional Therapies

- Epidural steroid injections (off-label)
- Radio frequency ablation
- Spinal cord stimulation
- Intrathecal pumps

Surgery

- Spinal fusion
- Disc replacement

CLBP = Chronic Low Back Pain | DDD = Degenerative Disc Disease



Rexlemestrocel-L

Heart Failure

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Cardiopulmonary Indications Leveraging Rexlemestrocel-L Mechanism

LVAD BLA approval for rexlemestrocel-L can open label extension potential in two additional blockbuster indications with same mechanism of action

End-Stage HFrEF with LVAD

End-stage HFrEF with inflammation

LVAD 159 Patient trial: Reduction in major GI bleeding and RV dysfunction

NYHA Class II/III HFrEF

NYHA class II/III HFrEF with inflammation

DREAM-HF 565 patient trial: Reduction in cardiac death, MI, stroke

Group 2 Pulmonary Hypertension (HFrEF, HFpEF)

PH with inflammation in HFrEF

DREAM-HF 565 patient trial: Improved diastolic function, pulmonary hypertension and survival

Intra-Myocardial Rexlemestrocel-L Reduces Inflammation And Reverses Endothelial Dysfunction

Reduces M1 Macrophage and T Cell Burden (IL-1β, IL-6, IL-12 and IFN-γ)
Improves endothelial dysfunction / NO signaling
Improves Left Ventricular Function
Improves Pulmonary Arterial Hypertension And Right Ventricular Function

LVAD = Left Ventricular Assist Device | BLA = Biologics License Application | HFrEF = Heart Failure reduced Ejection Fraction | HFpEF = Heart Failure preserved Ejection Fraction | NYHA = New York Heart Association | GI = Gastrointestinal | MACE = Major Adverse Cardiac Event | MI = Myocardial Infarction | PH = Pulmonary Hypertension | NO = Nitric Oxide

Rexlemestrocel-L Reduces GI Bleeding in End-stage HFrEF Patients with LVADs by Reversing Endothelial Dysfunction of GI Blood Vessels Due to Inflammation

LVAD II: 6-Month Rate of Major Mucosal Bleeding Events (MMBE)

Subjects from LVAD II Study	Control (MMBE rate/100 patient months)	Rexlemestrocel-L (MMBE rate/100 patient months)	Nominal p value
All subjects (N=159)	15.6	3.8	<0.0001
Destination Therapy (n=59)	20.4	2.5	0.0007
Bridge to Transplant (n=100)	12.9	4.6	0.0172

- File with FDA for full approval for rexlemestrocel-L in patients with LVADs
- Major GI Bleeding is an FDA-acknowledged indication with rexlemestrocel-L having received Orphan Drug designation
- FDA has confirmed at a recent meeting that the BLA filing may proceed for patients with life-threatening major gastrointestinal bleeding

GI = Gastrointestinal | HFrEF = Heart Failure reduced Ejection Fraction | LVAD = Left Ventricular Assist Device | MMBE = Major Mucosal Bleeding Events | ITT = Intention to Treat

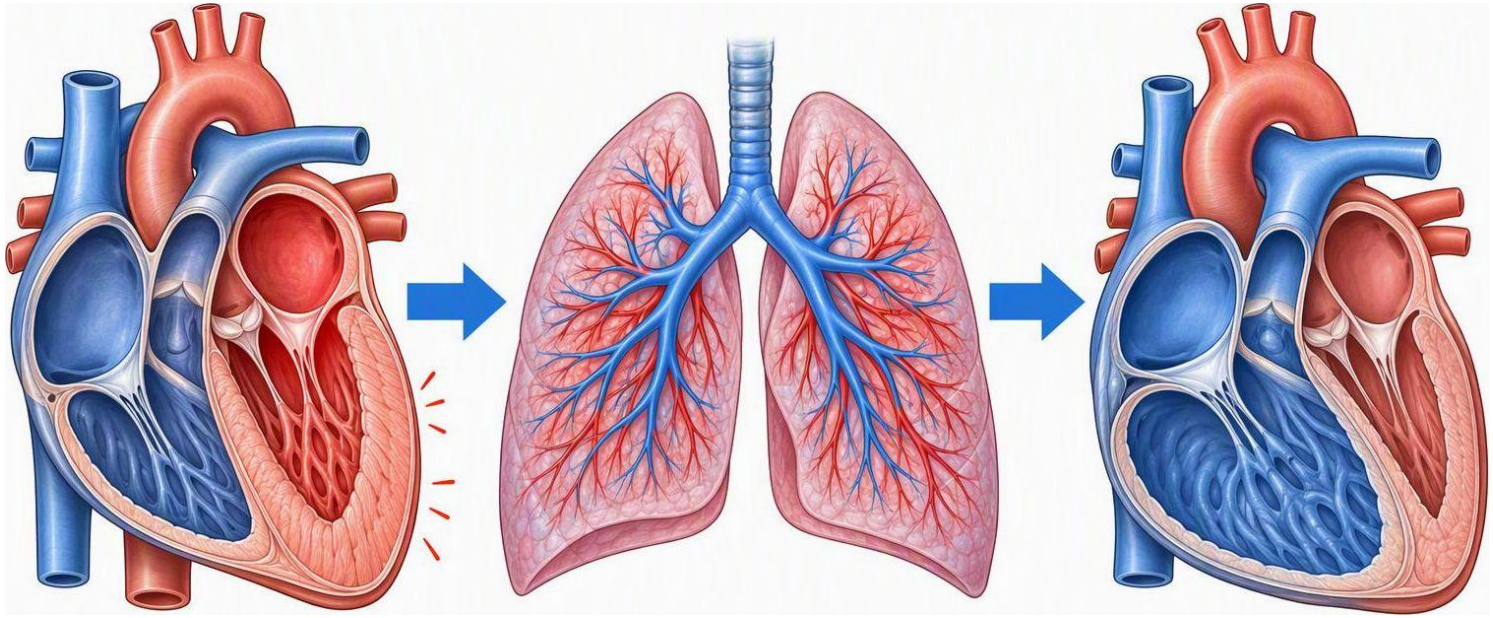
Group 2 Pulmonary Hypertension (Due to LV Dysfunction)

Left-heart disease raises pulmonary pressure and right ventricular load

Left-heart disease

Pulmonary venous hypertension

Right ventricular strain



LV or valve disease raises left atrial pressure

Pressure backs up into lung veins and capillaries

Higher pulmonary pressure increases RV afterload

Rexlemestrocel-L Improved Survival in HFrEF with Group 2 Pulmonary Hypertension in DREAM-HF Trial

- In the DREAM-HF population with HFrEF, 219 patients had established Group 2 Pulmonary Hypertension, defined by pulmonary artery systolic pressure (PASP) >35 mmHg,
- Across all 219 patients, a single intra-cardiac injection of rexlemestrocel-L improved left ventricular diastolic function as measured by Doppler echocardiography
- A single intra-cardiac injection of rexlemestrocel-L reduced Left Atrial Volume Index (LAVI) over 36 months, a major risk factor for mortality related to Pulmonary Hypertension in both HFrEF and HFpEF
- A single intra-cardiac injection of rexlemestrocel-L reduced cardiac mortality by 53% in HFrEF patients with Type 2 Pulmonary Hypertension and active inflammation defined by CRP >2 mg/L (p=0.036)

Group 2 PH: A Large Unmet Need with No Approved Drugs

Left heart disease is the most common cause of pulmonary hypertension, creating a substantial addressable population

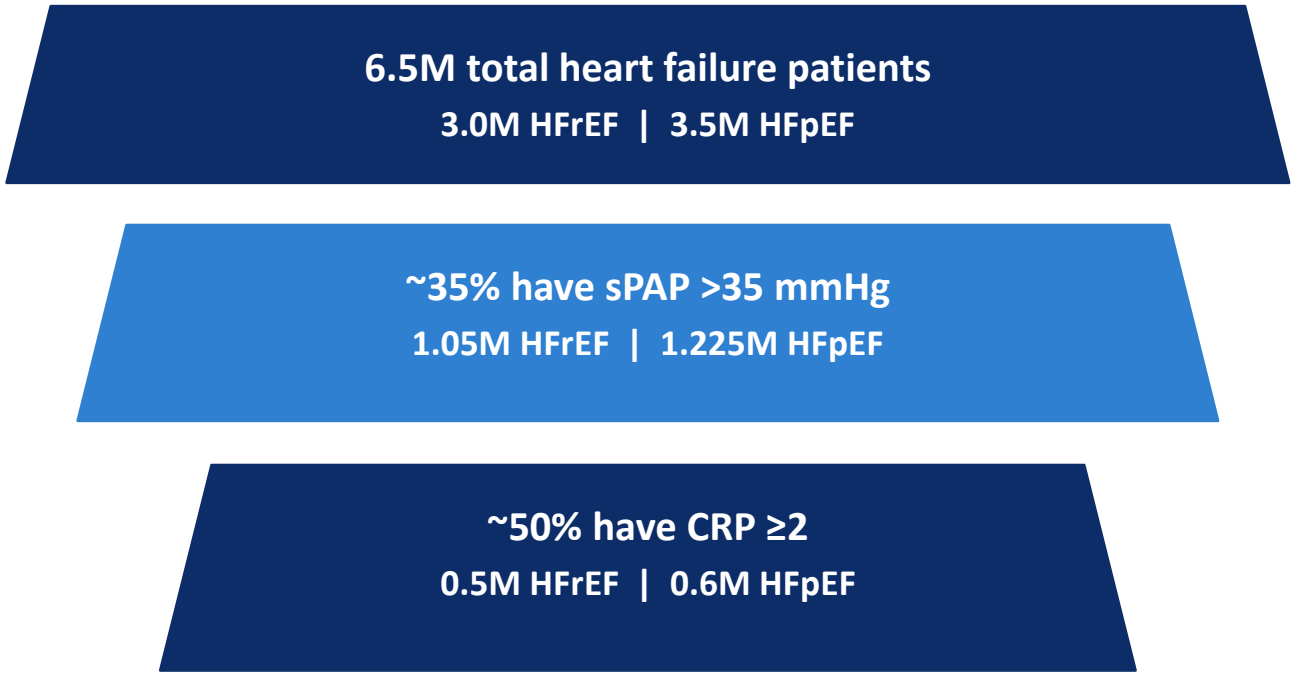
GROUP 2 PH - CLINICAL CONTEXT

★ **Most common PH group**
Approximately 40% of left-sided heart failure

★ **No approved drug therapy**
No drugs currently used for HFrEF or HFpEF have any effect on Group 2 PH, nor do any approved drugs for other forms of PH

Total Addressable Market for Rexlemestrocel-L

Illustrative patient funnel | United States



Potential target population:
~1.1M patients

PH = Pulmonary Hypertension | HFrEF = Heart Failure reduced Ejection Fraction | CRP = C-reactive Protein | HFpEF = Heart Failure preserved Ejection Fraction | sPAP = Systolic Pulmonary Artery Pressure



In Summary

Summary of Major Milestones

Commercial growth and label expansion for RYONCIL, alongside advancement of rexlemestrocel-L blockbuster programs

1 COMMERCIAL + LABEL EXPANSION

RYONCIL® (remestemcel-L-rknd)

GROW Strongly expand the revenue base and increase penetration of pediatric SR-aGvHD

EXPAND Complete adult SR-aGvHD registrational trial in second-line Grade III/IV

EXTEND Advance pediatric inflammatory rare diseases, including Duchenne, and pursue partnerships

Adult SR-aGvHD market is ~3× the pediatric market

2 BLOCKBUSTER PROGRAM

Chronic low back pain (CLBP)

COMPLETED Patient treatment completed in the pivotal Phase 3 trial in August

READOUT Continue patient follow-up through 12 months

FILE Trial completion targeted for mid-CY2027, followed by BLA filing

Pivotal Phase 3 program progressing toward BLA

3 BLOCKBUSTER PROGRAM

Advanced & End-stage heart failure (CHF)

FILE Complete BLA filing for end-stage heart failure patients on LVADs

EXTEND Facilitate label extensions into Pulmonary Hypertension and NYHA II/III HFrEF

PARTNER Pursue cardiopulmonary strategic alliance

LVAD filing can establish the regulatory foundation

SR-aGvHD = Steroid-refractory Acute Graft-versus-Host Disease | BLA = Biologics License Application | LVAD = Left Ventricular Assist Device | HFrEF = Heart Failure reduced Ejection Fraction | NYHA = New York Heart Association



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Thank You