Lexeo Therapeutics
Q3’24 Earnings Update

November 13, 2024

Forward-Looking Statements

This presentation contains “forward-looking statements” within the meaning of the federal securities laws, including, but not limited to, statements regarding Lexeo’s expectations and plans regarding its current product candidates and programs, including statements regarding the timing, progress and results of preclinical and clinical trials of Lexeo’s gene therapy product candidates, the anticipated benefits of its current product candidates, the timing and likelihood of regulatory approval and expected cash runway. Words such as “may,” “might,” “will,” “objective,” “intend,” “should,” “could,” “can,” “would,” “expect,” “believe,” “design,” “estimate,” “predict,” “potential,” “develop,” “plan” or the negative of these terms, and similar expressions, or statements regarding intent, belief, or current expectations, are forward-looking statements. While Lexeo believes these forward-looking statements are reasonable, undue reliance should not be placed on any such forward-looking statements. These forward-looking statements are based upon current information available to the company as well as certain estimates and assumptions and are subject to various risks and uncertainties (including, without limitation, those set forth in Lexeo’s filings with the U.S. Securities and Exchange Commission (SEC)), many of which are beyond the company’s control and subject to change. Actual results could be materially different from those indicated by such forward looking statements as a result of many factors, including but not limited to: risks and uncertainties related to expectations regarding the initiation, progress, and expected results of Lexeo’s preclinical studies, clinical trials and research and development programs; the unpredictable relationship between preclinical study results and clinical study results; delays in submission of regulatory filings or failure to receive regulatory approval; liquidity and capital resources; and other risks and uncertainties identified in Lexeo’s Annual Report on Form 10-K for the year ended December 31, 2023, filed with the SEC on March 11, 2024, Quarterly Report on Form 10-Q for the quarter ended June 30, 2024, filed with the SEC on August 12, 2024, and subsequent future filings Lexeo may make with the SEC. New risks and uncertainties may emerge from time to time, and it is not possible to predict all risks and uncertainties. Lexeo claims the protection of the Safe Harbor contained in the Private Securities Litigation Reform Act of 1995 for forward-looking statements. Lexeo expressly disclaims any obligation to update or alter any statements whether as a result of new information, future events or otherwise, except as required by law.

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Significant Progress Across Cardiac Portfolio; Setting up Multiple Catalysts in 2025

LX2006 (FA-CM)

- ✓ Reached alignment with FDA on key elements of registrational development plan for LX2006
  - Including accelerated approval pathway with LVMI and frataxin protein expression as co-primary registrational endpoints
- ✓ Received RMAT designation, potentially enabling expedited development and increased interaction with FDA
- ✓ Completed enrollment of SUNRISE-FA, with four participants treated in cohort 3
  - Total of 16 participants dosed with LX2006 across SUNRISE-FA and Weill Cornell studies
- ✓ Additional cardiac biopsy from cohort 2 and functional scales from SUNRISE-FA, including KCCQ and mFARS to be presented at ICAR on November 15th

LX2020 (PKP2-ACM)

- ✓ Completed enrollment of cohort 1 of HEROIC-PKP2 (n=3)
  - Initial clinical data including safety and biodistribution on track for late first quarter or early second quarter of 2025

LVMI, Left Ventricular Mass Index; mFARS, modified Friedreich ataxia rating scale; KCCQ-12, Kansas City Cardiomyopathy Questionnaire.

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LX2006 Regulatory Update Following Type C Meeting Focused on Surrogate Endpoints

Key Registrational Trial Design Element	FDA Alignment
• Increase in frataxin expression and reduction in LVMI as co-primary registrational endpoints to support accelerated approval	✓ Alignment
• Agreed upon target levels, including 10% reduction in LVMI and 40% frataxin positive area as measured by immunohistochemistry	✓ Alignment
• Histology-based measurement of frataxin and cardiac MRI as acceptable measurement tools	✓ Alignment
• Use of secondary endpoints including left ventricular wall thickness and troponin as supportive measures of efficacy	✓ Alignment
• Enrollment of patients with elevated LVMI at baseline in registrational trial	✓ Alignment
• Final dose selection and size of registrational trial guided by cohort 3 biopsy results	Alignment Expected in 2025

LVMI, Left Ventricular Mass Index; MRI magnetic resonance imaging.

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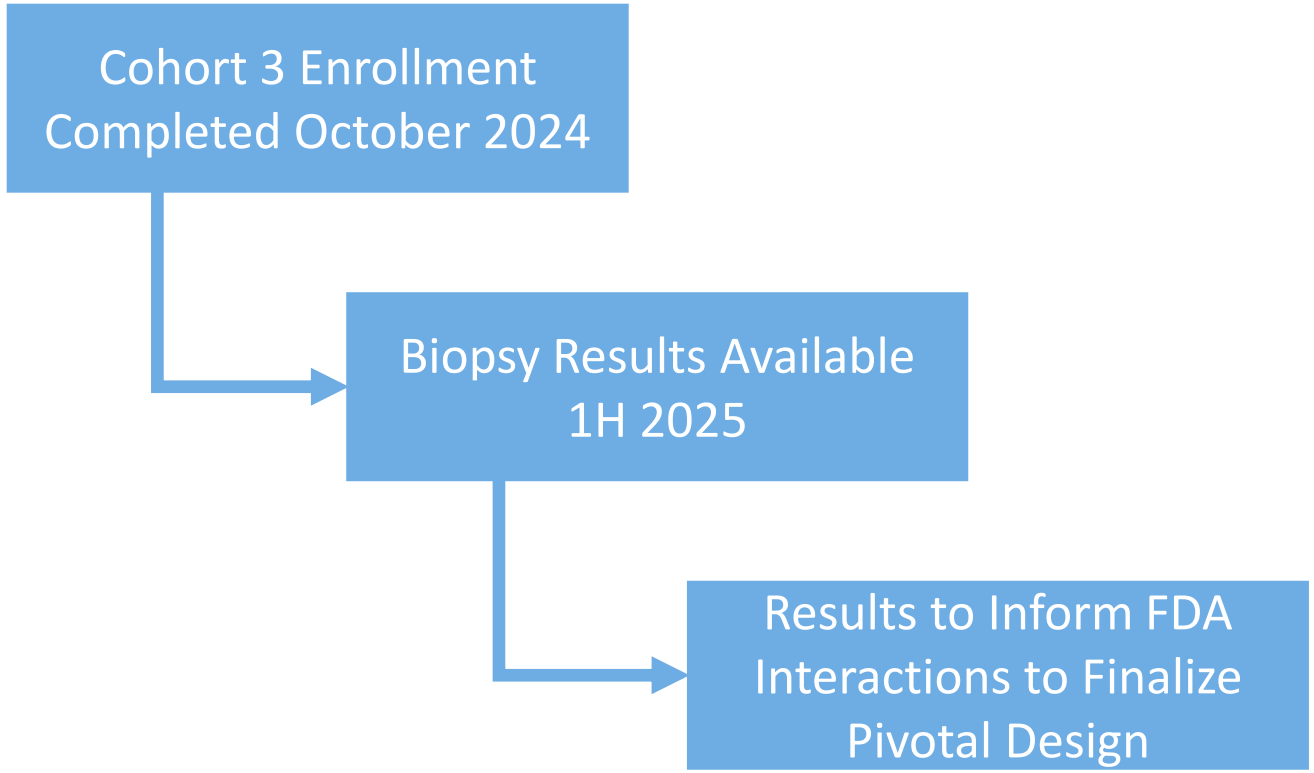
Cohort 3 Cardiac Biopsy Results to Guide Final Alignment on Registrational Trial Design Elements

Additional Registrational Trial Design Elements

- Additional FDA interactions to focus on remaining elements of registrational study design, including:
  - Final dose selection
  - Registrational trial size
- Outcomes guided by cohort 3 biopsy results to determine dose selection and powering for trial size



July 2024 Data Update Served as Evidence Package for Initial Engagement; Cohort 3 Biopsy Results to Guide Final Alignment on Pivotal Trial Design in 2025

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Enrollment Update Across SUNRISE-FA and Weill Cornell Investigator Initiated Trial

Lexeo Sponsored SUNRISE-FA

Dose Cohort	Participant #	Cardiac Biopsy	Months of Follow-up in July'24 Update
Cohort 1 ($1.8x10^{11}$ vg/kg)	Participant 6	✓	12 months
Cohort 2 ($5.6x10^{11}$ vg/kg)	Participant 9	✓	12 months
	Participant 10	✓	6 months
	Participant 11	✓	Not included
Cohort 3 ($1.2x10^{12}$ vg/kg)	Participant 12	✓	Not included
	Participant 14	✓	Not included
	Participant 15	✓	Not included
	Participant 16	✓	Not included

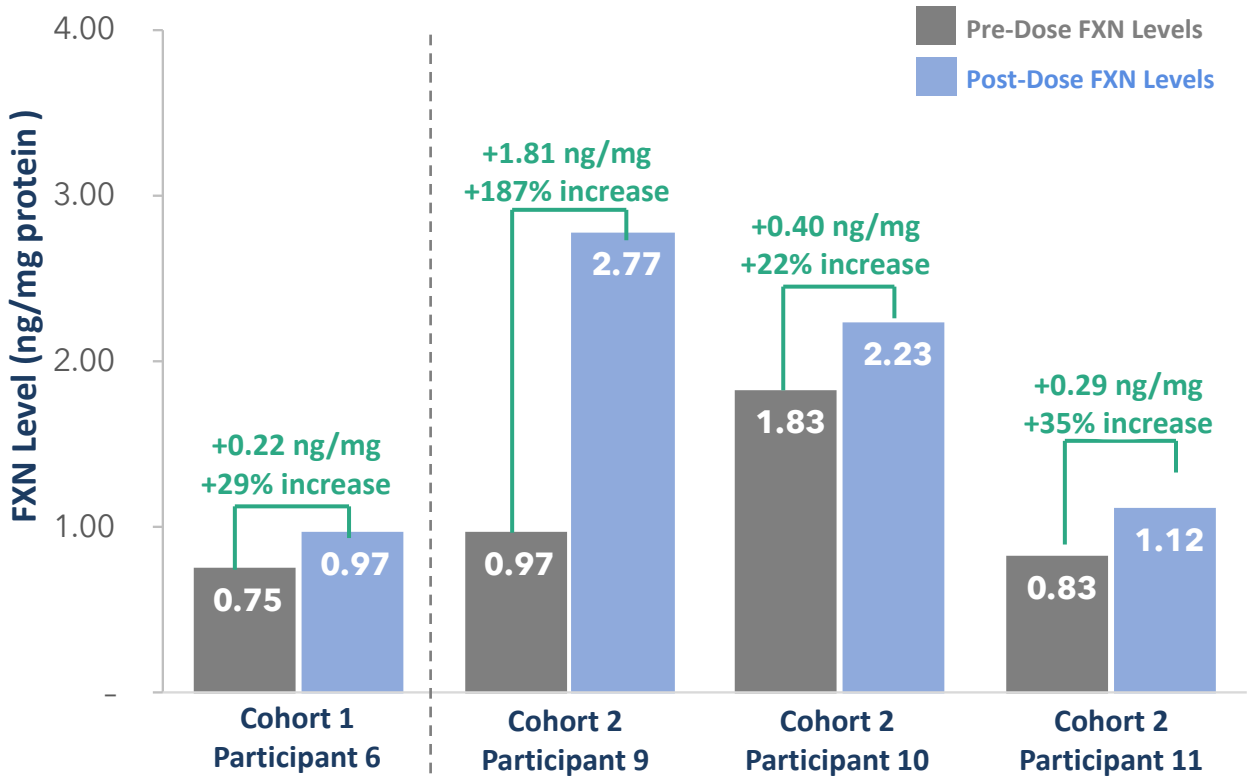
Weill Cornell Investigator Initiated

Dose Cohort	Participant #	Cardiac Biopsy	Months of Follow-up in July'24 Update
Cohort 1 ($1.8x10^{11}$ vg/kg)	Participant 1	✗	18 months
	Participant 2	✗	18 months
	Participant 3	✗	12 months
	Participant 4	✗	12 months
	Participant 5	✗	6 months
Cohort 2 ($5.6x10^{11}$ vg/kg)	Participant 7	✗	Not included
	Participant 8	✗	Not included
	Participant 13	✗	Not included
	Participant 17: Not yet enrolled		
	Participant 18: not yet enrolled		

- November 15, 2024 ICAR presentation includes SUNRISE-FA patients (cohorts 1 and 2) from same data cut as July 2024 interim readout
- Presentation to highlight protein expression and change in functional scores (including KCCQ and mFARS)
  - Includes previously guided final Cohort 2 biopsy from participant 11
- Indicates patient data to be included in ICAR presentation

Cardiac Biopsies Have Demonstrated Increased Frataxin Expression in Heart in All Participants Evaluated to Date Utilizing Two Measurement Techniques

Pre- and Post-Treatment FXN Levels (LCMS)

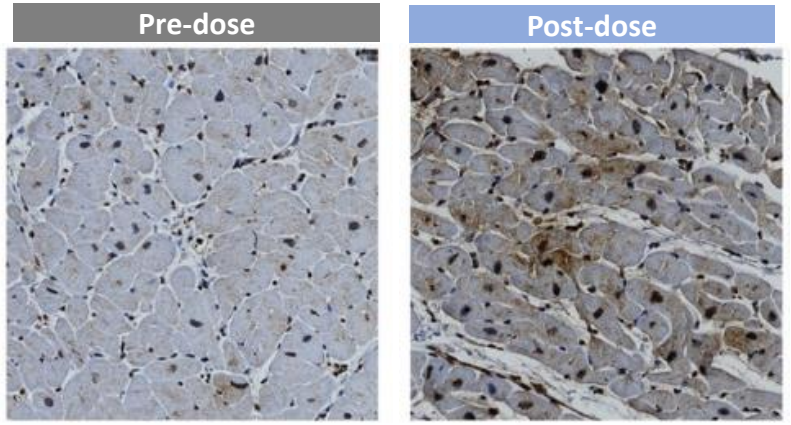


Quantified IHC (FXN % Positive Area[(1)])

	Pre-Dose	Post-Dose	% Increase
(C1) Participant 6	31%	51%	+65%
(C2) Participant 10	18%	54%	+209%
(C2) Participant 11	7%	26%	+279%

Average Post-Dose IHC of 44%

IHC images from Participant 10



LCMS, Liquid chromatography mass spectrometry; FXN, Frataxin; IHC, Immunohistochemistry. Note: Participant 9 IHC data could not be interpreted reliably due to technical issues due to sample quality.
(1) Area measurement in square microns, FXN area as a percentage of total tissue showing FXN expression.

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Significant Progress in 2024 Across Lead Programs Supported by Strong Balance Sheet

Program	Upcoming Milestones	US Prevalence
LX2006 FA Cardiomyopathy	• Mid 2024: Interim Data Readout ✓ • Year End 2024: Update on ongoing regulatory engagements ✓	~5K
LX2020 PKP2-ACM	• Late Q1/Early Q2 2025: Interim Data Readout (Cohort 1)	~60K
LX1001 Alzheimer's: APOE4	• October 2024: Interim Phase 1/2 Data Readout ✓	~900K
LX2021 DSP Cardiomyopathy	• 2024: Initiate IND-enabling Studies	~35K

Upcoming Program Milestones to be Announced at 2025 JPMorgan Healthcare Conference

Cash and marketable securities[1]	Projected runway into	Shares of common stock outstanding[2]
~$157M	2027	33.1M
Balance sheet as of September 30, 2024	Significant runway following key catalysts	Shares outstanding as of November 11, 2024

(1) Cash, cash equivalents and investments in marketable securities as of September 30, 2024.
(2) Shares outstanding as of November 11, 2024.

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