First Quarter 2018
Financial and Operational Results

May 8, 2018

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Acceleron Forward-Looking Statements

THIS PRESENTATION CONTAINS FORWARD-LOOKING STATEMENTS ABOUT THE COMPANY'S STRATEGY, FUTURE PLANS and prospects, including statements regarding the development of the Company's compounds, the timeline for clinical development and regulatory approval of the Company's compounds and the expected timing for reporting of data from ongoing clinical trials. The words "anticipate," "believe," "could," "estimate," "expect," "goal," "intend," "may," "plan," "potential," "project," "should," "target," "will," "would," and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

ACTUAL RESULTS COULD DIFFER MATERIALLY FROM THOSE INCLUDED IN THE FORWARD-LOOKING STATEMENTS DUE to various risks and uncertainties, including, but not limited to, that preclinical testing of the Company's compounds and data from clinical trials may not be predictive of the results or success of ongoing or later clinical trials, that the development of the Company's compounds will take longer and/or cost more than planned, that the Company or its collaboration partner, Celgene, will be unable to successfully complete the clinical development of the Company's compounds, that the Company or Celgene may be delayed in initiating, enrolling or completing any clinical trials, and that the Company's compounds will not receive regulatory approval or become commercially successful products. These and other risks and uncertainties are identified under the heading "Risk Factors" included in the Company's most recent Annual Report on Form 10-K, and other filings that the Company has made and may make with the SEC in the future.

THE FORWARD-LOOKING STATEMENTS CONTAINED IN THIS PRESENTATION ARE BASED ON MANAGEMENT'S CURRENT views, plans, estimates, assumptions and projections with respect to future events, and the Company does not undertake and specifically disclaims any obligation to update any forward-looking statements.

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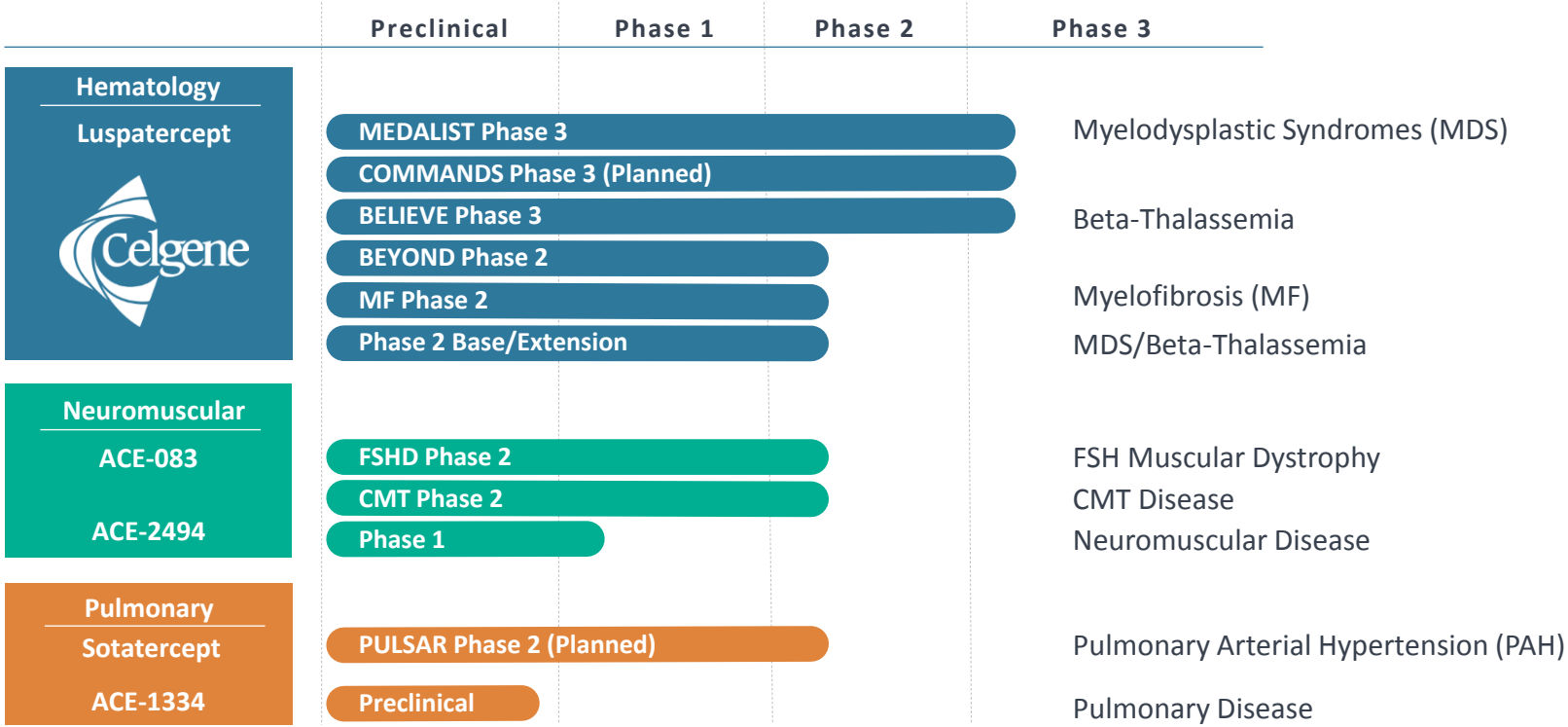
Habib Dable
Chief Executive Officer

ACCELERON

Building Therapeutic Area Leadership



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Luspatercept: Potential Multi-Billion-Dollar Opportunity

		U.S./EU Addressable Patient Population	
MEDALIST	Lower-risk MDS Second-line (RS+)	>40,000	Phase 3 Top-line Results Expected Mid-Year
BELIEVE	Beta-thalassemia Transfusion-dependent	>20,000	
COMMANDS	Lower-risk MDS First-line	>20,000	Phase 3 Trial Planned
BEYOND	Beta-thalassemia Non-transfusion-dependent	>20,000	Phase 2 Trials Initiated
NEW DISEASE INDICATION	Myelofibrosis	>15,000	

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Upcoming Luspatercept Phase 2 Congress Presentations

2018 ASCO®
ANNUAL MEETING

June 1-5, 2018
McCormick Place | Chicago, IL | #ASCO18

Abstracts Available: May 16, 2018

STOCKHOLM
23RD CONGRESS
JUNE 14 - 17 | 2018
European Hematology Association

Abstracts Available: May 17, 2018

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Neuromuscular Disease: Highlights and Priorities

ACE-083

MUSCLE & NERVE

AAN 2018 Annual Meeting

FDA FAST TRACK DESIGNATION

- **FSHD Phase 2 Trial**
  - Preliminary Part 1 Results Presented at AAN (final dose-escalation results **2H 2018)**
  - Initiated Part 2 of Phase 2 trial in FSHD (preliminary results **2H 2019**)
- **CMT Phase 2 Trial**
  - Part 1 of Phase 2 in CMT disease ongoing (preliminary results **2H 2018**)
  - Initiate CMT Part 2 of Phase 2 trial **YE 2018**

ACE-2494

- Phase 1 trial in healthy volunteers ongoing (preliminary results **1H 2019**)

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Phase 2 Trial with Sotatercept in PAH

PAH Phase 2 Trial

6-Month Primary Treatment Period

- Sotatercept 0.3 mg/kg plus SOC N=30
- Sotatercept 0.7 mg/kg plus SOC N=30
- Placebo (PBO) plus Standard of Care (SOC) N=30

Recent Highlights

- Hosted educational webinar

Corporate Priorities

- PULSAR Phase 2 trial
  - Initiate trial in **Q2 2018**
  - Preliminary results in **1H 2020**

Kevin McLaughlin
Chief Financial Officer

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Q1 2018 Financial Results

Cash	
Cash, cash equivalents and investments	$353.3M
Revenue	
Collaboration Revenue	$3.2M
Costs, Expenses and Other Income	
Total Costs and Expenses	$30.8M
R&D Expenses	$23.4M
G&A Expenses	$7.4M
Net Loss	
Net Loss	$26.2M

Current cash, cash equivalents and investments provide sufficient funding into **2021**

Note: Numbers may not foot due to rounding

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Q1 2018: Financial Results Q&A Session

Habib Dable	Chief Executive Officer
Kevin McLaughlin	Chief Financial Officer
Sujay Kango	Chief Commercial Officer
Matthew Sherman, M.D.	Chief Medical Officer
John Quisel, Ph.D., J.D.	SVP, Corporate Development
Chris Rovaldi	SVP, Operations and Program Management
Todd James, IRC	VP, Investor Relations and Corp. Comm.

THANK YOU

www.acceleronpharma.com
NASDAQ: XLRN