Second Quarter 2019 Financial Results

August 5, 2019

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 factors, 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 results of any clinical trial may not be predictive of the results or success of other clinical trials of the same product candidate, that the development of the Company's compounds will take longer and/or cost more than planned, that the Company will be unable to successfully complete the clinical development of the Company's compounds, that the Company 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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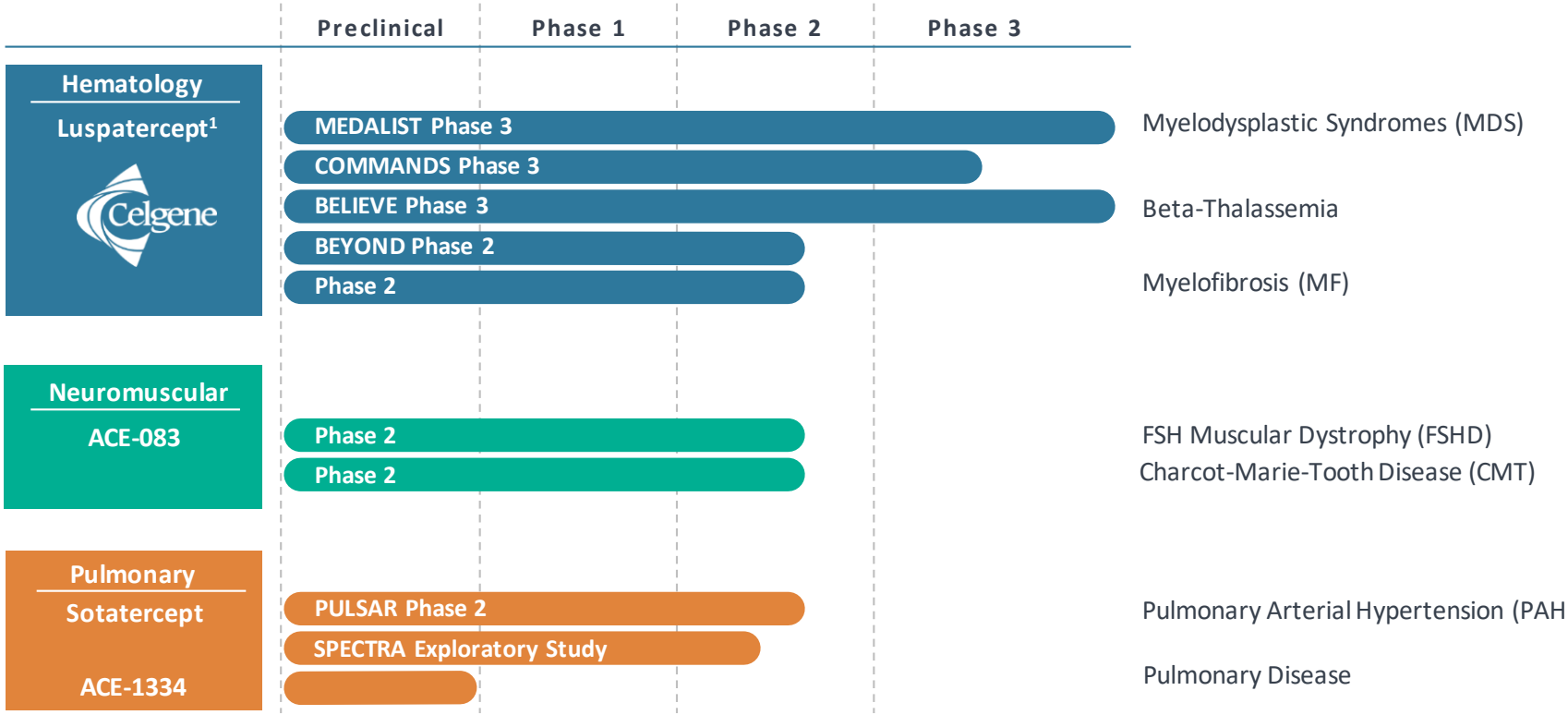
Habib Dable
Chief Executive Officer

ACCELERON

Building Therapeutic Area Leadership



1. Luspatercept clinical trials in collaboration with Celgene

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US and EU Marketing Applications Accepted

BELIEVE

Phase 3

Beta-Thalassemia, Transfusion-Dependent

December 4, 2019
FDA PDUFA Target Action Date

MEDALIST

Phase 3

Lower-Risk MDS, RS+

April 4, 2020
FDA PDUFA Target Action Date

EMA decision on MAA expected in 2H 2020

All luspatercept regulatory activities are in collaboration with Celgene

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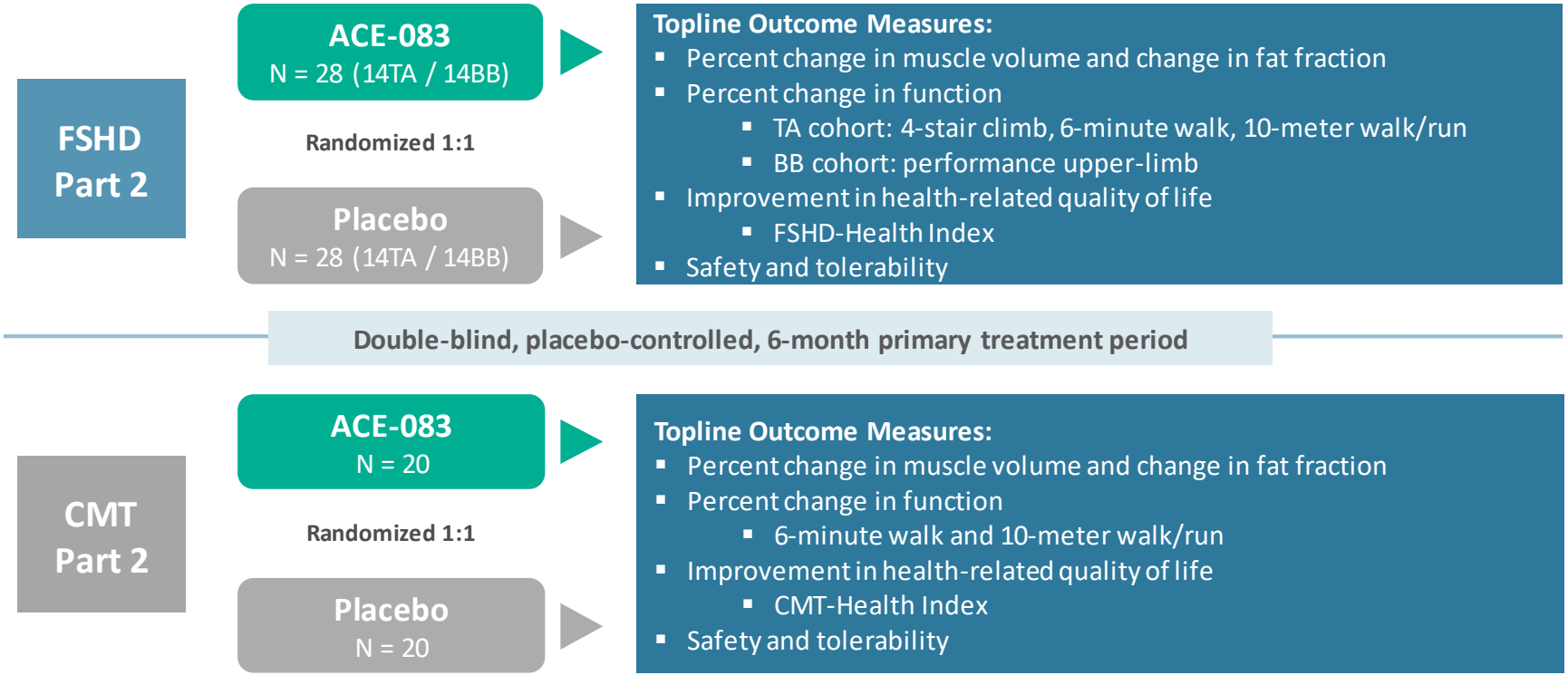
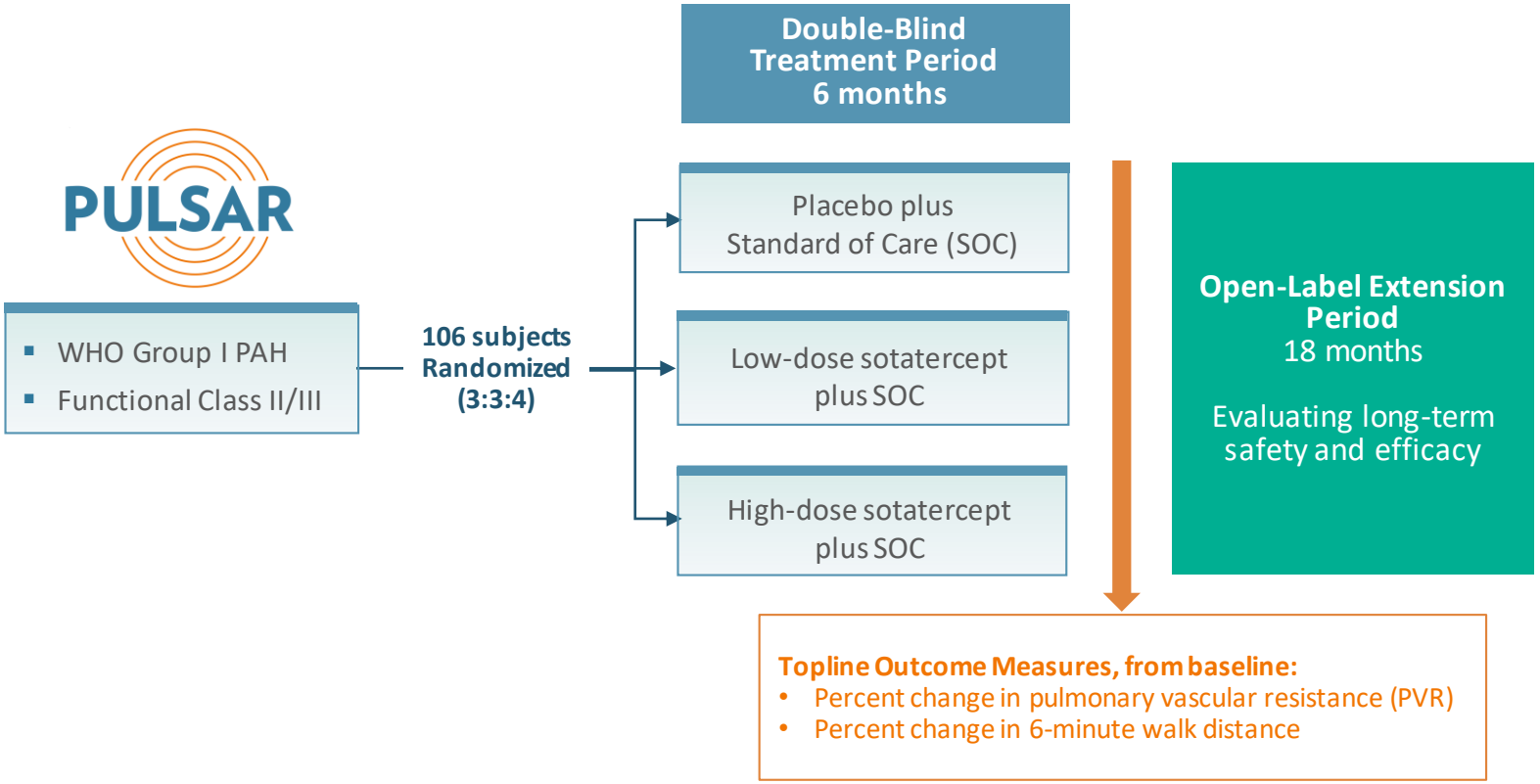
ACE-083 Part 2 of Phase 2 Trials Fully Enrolled



* TA:Tibialis Anterior; BB:Biceps Brachii

Sotatercept PULSAR Phase 2 Trial Fully Enrolled



Kevin McLaughlin
Chief Financial Officer

ACCELERON

Q2 2019 Financial Results

Cash	
Cash, cash equivalents and investments	$500.9M
Revenue	
Collaboration Revenue (includes regulatory milestone)	$27.7M
Costs and Expenses	
Total Costs and Expenses	$48.8M
R&D Expenses	$34.8M
G&A Expenses	$14.0M
Net Loss	
Net Loss	$17.9M

Note: Numbers may not foot due to rounding

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Upcoming Corporate Priorities

HEMATOLOGY

- **Luspatercept**
  - FDA PDUFA target action dates:
    - Beta-thalassemia expected December 2019 and MDS expected April 2020
  - EMA decision on the MAA expected in **2H 2020**
  - MEDALIST and BELIEVE Phase 3 trial results planned to be submitted for publication in **2019**
  - Myelofibrosis Phase 2 trial results expected by **YE 2019**
  - BEYOND Phase 2 trial topline results expected by **YE 2020**, COMMANDS Phase 3 trial patient enrollment
  - Potential expansion of clinical program into other indications in **2019**

NEUROMUSCULAR

- **ACE-083**
  - FSHD Part 2 of the Phase 2 trials topline results expected in **2H 2019**
  - CMT Part 2 of the Phase 2 trials topline results expected in **Q1 2020**

PULMONARY

- **Sotatercept**
  - PULSAR Phase 2 trial topline results now expected in **Q1 2020**
  - SPECTRA exploratory study preliminary results expected in **2020**

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Q2 2019: Financial Results Q&A Session

Habib Dable	Chief Executive Officer
Kevin McLaughlin	Chief Financial Officer
John Quisel, Ph.D., J.D.	Chief Business Officer
Sujay Kango	Chief Commercial Officer
Todd James, IRC	VP, Investor Relations and Corp. Comm.

THANK YOU

www.acceleronpharma.com
NASDAQ: XLRN