Forward Looking Statements

This presentation contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, including statements regarding the therapeutic potential of our programs for the modulation of adult stem cells to treat orphan diseases, and our preclinical and clinical development plans, including the timing and availability of both interim and full data in our Phase 2 clinical trial of PROHEMA® for hematologic malignancies in adults, our ability to advance and the timing for the development of PROHEMA® for the treatment of pediatric patients, the ability of PROHEMA® to enhance, and the potential therapeutic benefits of enhancing, the survival and immunological properties of T cells, the timing of and our ability to advance a Wnt7a protein analog into clinical trials, the therapeutic potential of a Wnt7a protein analog for the treatment of muscle damage and trauma, and the impact of our hiPSC platform technology. These and any other forward-looking statements in this presentation are based on management's current expectations of future events and are subject to a number of risks and uncertainties that could cause actual results to differ materially and adversely from those set forth in or implied by such forward-looking statements. These risks and uncertainties include, but are not limited to, the risks that the results observed in prior clinical development may not be replicated in our ongoing and subsequent clinical trials of PROHEMA®, PROHEMA® may not produce the therapeutic benefits suggested by the results observed in our prior clinical development or may cause other unanticipated adverse effects in subsequent clinical trials, the risk of cessation or delay of any ongoing or planned preclinical or clinical development activities for a variety of reasons, including additional information that may be requested or additional obligations that may be imposed by the FDA as a condition to our initiation of new clinical trials or continuation of clinical trials with PROHEMA®, any delays in enrollment of clinical trials with PROHEMA®, any negative results following resumption of clinical trials with PROHEMA®, any inability to complete the cell-line development, in vivo studies, and pharmacokinetic and toxicology assessments necessary to advance our Wnt7a analog program into clinical development, and any inability to develop hiPSC-derived cells suitable for therapeutic applications. For a discussion of other risks and uncertainties, and other important factors, any of which could cause our actual results to differ from those contained in the forward-looking statements, see the risks and uncertainties detailed in the company’s periodic filings with the Securities and Exchange Commission, including but not limited to the company’s Form 10-Q for the first quarter ended March 31, 2014, and from time to time the company’s other investor communications. Fate Therapeutics is providing the information in this press presentation as of this date and does not undertake any obligation to update any forward-looking statements contained in this presentation as a result of new information, future events or otherwise.
Fate Therapeutics:
Stem Cell Therapeutics for Rare, Life-Threatening Diseases

Pioneer in the Modulation and Programming of Adult Stem Cells

Clinical Proof-of-Concept Established: Ex vivo modulation of HSCs and T-cells

Lead Candidate in Phase 2: PROHEMA®
Capital-efficient Path to BLA

Pipeline Poised for Clinical Data Read Outs In Multiple Rare Genetic Disorders

Strong Fundamentals: Science, Team, IP Estate, Balance Sheet
The Promise of Stem Cells

Stem Cell Therapeutics → Transform Patient Outcomes

Groundbreaking Science
- 1990 Nobel prize
- 2012 Nobel prize

Transformative Potential
- Oncology, rare diseases
- Degenerative disorders

Pathways to Product Approval
- >300 clinical trials
- Regulatory guidances

Fate Therapeutics
Guiding cells to improve life
The Future of Stem Cell Therapeutics

- Optimized Stem Cells for Cellular Replacement & Repair
  - Ex Vivo Modulation
  - Stem Cell Therapeutics

- Activation of Resident Stem Cells for Tissue Regeneration
  - In Vivo Modulation
  - Protein Therapeutics

- Programming of Stem Cell Fate for Regenerative Medicine
  - iPSC Programming
  - Differentiated Cell
  - iPSC-derived Therapeutic
PROHEMA® Franchise
Ex Vivo Modulation
Creating Optimized Cell Therapeutics to Improve Outcomes in Life-Threatening Disorders

Therapeutic Paradigm

Unmodulated Cell
- Bone marrow
- Mobilized PB
- Cord blood
- Isolated HSCs
- Isolated T-cells

Optimized Cell Therapeutic
- Cure of leukemia and lymphoma
- Correct rare genetic disorders
- Achieve remission
- Survival of MI or stroke
- Control of inflammatory disorders

Fate Platform
- Foundational IP estate
- HSC biology
- Screening and in-vitro assays
- Preclinical models
- Clinical translation

Ex vivo modulation

Prostaglandin E2 regulates vertebrate haematopoietic stem cell homeostasis
Tinsa E. North,1,2,4 Wolfram Gueseling,1,2 Carl R. Walkley,1,2 Claudia Lengfelder,1,2 Karsten R. Kruse,1,2 Allogna M. Lord,1,2 Gerhard J. Walter,1,2 Teresa V. Biewener,1,2,5,6 H-Hao Jiang,7,8 The Grosser,1,2,7,8 Garrett A. Fitzgerald,1,2,7,8 George Q. Daley,1,9,10 Stuart H. Orkin,1,9,10 & Leonard I. Zon1,2,4

Prostaglandin-modulated umbilical cord blood hematopoietic stem cell transplantation
Optimized Cell Therapeutics
Potential to Improve Patient Outcomes Through Diverse In vivo Effects

HSC engraftment in the bone marrow

Cellular enzyme replacement in the CNS

Immune-modulation (T-cell)

Cellular repair of ischemic injury

- HSC (per 10^6 BM) 12w
- Vehicle
- ProHema

- Modulated
- Unmodulated

- No Cells
- No Treatment
- ProHema

- IDUA
- Hu CE IDUA (CD34+)/Million mouse

- dmPGE2 pathway activation in T-cell

- Reduced functional impairment in rat stroke model
Optimized HSC Therapeutics

A Paradigm-changing Approach to Improving Patient Outcomes in Allogeneic HSCT

Hematologic Malignancies  ↔  Allogeneic HSCT  ↔  Rare Genetic Disorders

20-30% Transplant Related Mortality

- HLA Matching Conditioning
- Graft Failure Infections
- GvHD Viral Reactivation
- Durable Engraftment Relapse

Pre-HSCT  Engraftment  Immune Function  Long-Term

HSC source  HSCs  T-cells

Approach: Modulate Cells from Different HSC Sources to Improve Patient Outcomes and the Risk/Benefit of HSCT

Fate Therapeutics
Guiding cells to improve life
PROHEMA® Clinical Proof-of-Concept with Prototype
Enhanced Neutrophil Engraftment in Patients with Hematologic Malignancies

24% of control subjects
0% of PROHEMA® subjects

Death or graft failure by Day 100

% of Patients – Neutrophil Engraftment

Days after HSCT

PROHEMA® Cohort (n = 12)

Historical Control Group (n = 53)

• **Recent publication from Harvard Medical School**
  - Molecular and functional T-cell response to dmPGE2
  - Skewing towards CD8+ naïve T-cells in PROHEMA® cohort

• **Low rates of viral reactivation in PROHEMA® cohort**
  - CMV: 2/12 patients (16%) (36-56% literature)
  - EBV-PTLD: 0/12 patients (0%) (~4-16% literature)

* CMV: Cytomegalovirus; EBV: Epstein Barr virus; PTLD: Post-transplant Lymphoproliferative disorder

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**PROHEMA® Clinical Proof-of-Concept with Prototype**

**Emerging Evidence of T-cell-related Immunomodulatory Effects**

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**CD8+ Naïve T-cells**

**CD4+ Naïve T-cells**

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* CMV: Cytomegalovirus; EBV: Epstein Barr virus; PTLD: Post-transplant Lymphoproliferative disorder
PROHEMA®

Ex-vivo Modulation of Cord Blood as an Initial Product Opportunity

PROHEMA®
- Cord blood-derived, pharmacologically optimized HSC therapeutic
- Regulated by FDA as a cell therapy (CBER)
- Manufactured at center of care on day of transplant
- Combines the multiple advantages of cord blood with those of ex-vivo modulation
PROHEMA®: Optimized for Clinical Development

Manufacturing Optimization
— Use of proprietary new media
— More potent dmPGE2 pathway activation
— Enhanced efficacy in preclinical models

Phase 2 PUMA Study Initiated
— Randomized, controlled, multicenter
— 60 adult patients; 2:1 randomization
— Powered for neutrophil engraftment

Pathway Activation

Engraftment

Planned interim (2H14)
- Data from first 12 PROHEMA subjects
- Review by data monitoring committee

Full results expected in mid 2015

Phase 1b PROMPT Study Cleared
— Enrollment to begin in mid-2014
— 18 pediatric patients, 3 top U.S. centers
PROHEMA®: Capital-Efficient Path to BLA

- **Phase 1b PoC**
  - Adults, dUCBT

- **Phase 1b**
  - Pediatrics, sUCBT

- **Phase 2**
  - Adults, dUCBT

- **Phase 3**
  - Adult and pediatric patients
  - sUCBT and dUCBT
  - Potential for engraftment as 1st endpoint

- BLA

**✓ Potential for expedited regulatory pathway**
- Orphan designation granted
- Eligible for fast-track designation

**✓ Capital-efficient development**
- Potential for a single Phase 3 trial
- On-site manufacturing model leverages existing infrastructure
PROHEMA® Franchise Commercialization Considerations

- Addressable market growing at ~10% YoY
- Centers of excellence model

- Procedures concentrated at top US centers
- Addressable with small sales force
PROHEMA® in Lysosomal Storage Disorders
Opportunity for Franchise Expansion into Rare Genetic Disorders

- **Demyelinating LSDs**
  - CNS enzyme deficiencies lead to early death
  - Cord blood HSCs correct CNS enzyme deficiencies

- **Potential of PROHEMA®**
  - Improve engraftment outcomes
  - Enhance donor-HSC enzyme delivery to the CNS

![Graphs showing CNS engraftment, microglia in CNS, and enzyme mRNA in CNS](image)

*Human Specific DNA Sequence*

*Human Microglia (CD11b+)*

*Human Iduronidase mRNA*
Muscle Regeneration Franchise
Targeting Satellite Stem Cells for Skeletal Muscle Regeneration

In vivo activation with Wnt7a analog

Transplant of iPSC-derived Progenitors

Muscle Satellite Cell
(able to self-renew)

Muscular Dystrophies
Other Rare Genetic Disorders of Muscle
Sarcopenia Cancer Cachexia
Trauma SUI

Tedesco et al JCI 2010
Wnt7a Protein Therapeutics for Muscle Regeneration

**Therapeutic Paradigm**

Proprietary Wnt7a Protein Therapeutics

- Satellite Stem Cell Division
- Muscle Regeneration
- Muscle Function

In vivo modulation

Potential to regenerate muscle regardless of etiology or underlying genetic defect

**Fate Platform**

- Muscle satellite stem cell biology
- Wnt biology
- Wnt protein engineering
- Strong IP portfolio
- Preclinical models

**Fate Therapeutics**

Guiding cells to improve life
Preclinical Proof-of-Concept in Muscular Dystrophy Model

**Increase in Muscle Strength**

- **Mean Specific Force** (N/cm²)
  - WT: 30
  - Formulation Control: 20
  - MDX: 25
  - MDX: 27
  - MDX: 28

  *+17.6%  +18.7%***

**Reduced Inflammation of Muscle**

- Reduction in CD11b (marker of infiltrating monocytes, macrophages and granulocytes)

**Reduced Muscle Fiber Necrosis**

- Median fiber area (μm²/Animal)

  - Formulation: 100
  - wtWnt7a: 150
  - Pre-lead Analog: 200

  *N=5/7 in MDX Mice, *P<0.001*

**N=12 MDX Mice, ***P<0.0005**
Proprietary hiPSC Platform:
Enabling hiPSC-Derived Cellular Therapeutics
Therapeutic Paradigm

Somatic cell
from patient or healthy donor

- High programming efficiency
- Transgene-/xeno-free conditions

iPSC Derivation

HiPSC

HiPSC Differentiation

- Scalable, cost-effective media systems
- Homogenous and efficient differentiation

Muscle Stem Cells
Hematopoietic Cells
Other Cell Types

Patient

Fate Platform

- Industrialized iPSC generation
- iPSC differentiation
- Strong IP portfolio
- Preclinical models
## Therapeutic Pipeline

### HEMATOLOGIC MALIGNANCIES

<table>
<thead>
<tr>
<th>Program</th>
<th>Preclinical</th>
<th>Phase 1 - 2a PoC</th>
<th>Phase 2 - 3</th>
<th>Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td><em><em>PROHEMA</em> Adult hematologic malignancies</em>*</td>
<td></td>
<td>2H14 Interim</td>
<td></td>
<td>Worldwide</td>
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<tr>
<td><em><em>PROHEMA</em> Pediatric hematologic malignancies</em>*</td>
<td></td>
<td>Mid-2014 Clinical Study Initiation</td>
<td></td>
<td>Worldwide</td>
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### RARE GENETIC DISORDERS

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<th>Phase 2 - 3</th>
<th>Rights</th>
</tr>
</thead>
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<tr>
<td><em><em>PROHEMA</em> Lysosomal Storage Disorders</em>*</td>
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<td>2H14 Clinical Study Initiation</td>
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<td>Worldwide</td>
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<tr>
<td><strong>Next Generation HSC Therapeutics</strong></td>
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<td>2H14 Candidate</td>
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<td>Worldwide</td>
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<tr>
<td><em>Target indication(s) to be selected</em></td>
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</table>

### MUSCULAR DYSTROPHIES / MUSCLE DISORDERS

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<tr>
<th>Program</th>
<th>Preclinical</th>
<th>Phase 1 - 2a PoC</th>
<th>Phase 2 - 3</th>
<th>Rights</th>
</tr>
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<tbody>
<tr>
<td><strong>Wnt7a-based Protein Therapeutics</strong></td>
<td></td>
<td>2014 IND-Enablement</td>
<td></td>
<td>Worldwide</td>
</tr>
<tr>
<td><em>Muscular dystrophies and other muscle disorders</em></td>
<td></td>
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</table>

### IPSC- DERIVED CELLULAR THERAPEUTICS

<table>
<thead>
<tr>
<th>Program</th>
<th>Preclinical</th>
<th>Phase 1 - 2a PoC</th>
<th>Phase 2 - 3</th>
<th>Rights</th>
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</thead>
<tbody>
<tr>
<td><strong>iPSC-derived Cellular Therapeutics</strong></td>
<td></td>
<td>2014 Preclinical Proof-of-Concept</td>
<td></td>
<td>Worldwide</td>
</tr>
<tr>
<td><em>Myogenic and Hematologic Applications</em></td>
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</tbody>
</table>

*Ex vivo modulation* | *In vivo modulation* | *Ex vivo reprogramming*
## Leadership Team and Financial Highlights

### Leadership Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christian Weyer, MD</td>
<td>President and CEO</td>
</tr>
<tr>
<td>Scott Wolchko</td>
<td>CFO and COO</td>
</tr>
<tr>
<td>Pratik Multani, MD</td>
<td>CMO</td>
</tr>
<tr>
<td>Dan Shoemaker, PhD</td>
<td>CTO</td>
</tr>
<tr>
<td>Peter Flynn, PhD</td>
<td>SVP, Early Program Development</td>
</tr>
<tr>
<td>Moya Daniels, MS</td>
<td>VP, Regulatory Affairs and Quality Assurance</td>
</tr>
<tr>
<td>Cindy Tahl, Esq</td>
<td>VP, IP &amp; Senior Corporate Counsel</td>
</tr>
</tbody>
</table>

### Financial Highlights

- **Publicly-Traded**
  - FATE (NASDAQ)

- **Total Shares Outstanding**
  - 20.5 million

- **Cash & Cash Equivalents**
  - $47.9 million as of 1QE14

- **Operating Expense**
  - $5.7 million for 1Q14 \(^1\)

- **Employees**
  - 46

- **Headquarters**
  - San Diego, CA

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\(^1\) After adjusting for stock-based compensation expense and non-cash charges
Fate Therapeutics

*Stem Cell Therapeutics for Rare, Life-Threatening Diseases*