Fate Therapeutics (FATE)
Rating: Buy

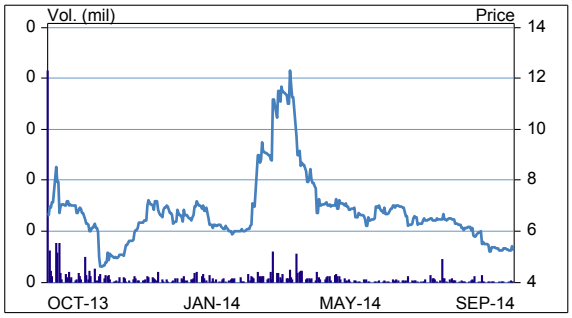
Reni Benjamin, Ph.D.
212-356-0542
rbenjamin@hcwresearch.com

FATE: Small Molecules with Regenerative Potential - Initiating with Buy Rating

Stock Data	09/05/2014
Price	$5.28
Exchange	NASDAQ
Price Target	$9.00
52-Week High	$13.55
52-Week Low	$4.30
Enterprise Value (MM)	$67
Market Cap (MM)	$109
Public Market Float (MM)	10.0
Shares Outstanding (MM)	20.6
3 Month Avg Volume	18,525
Balance Sheet Metrics	
Cash (MM)	$42.0
Total Debt (MM)	$0.7

EPS Diluted			
Full Year - Dec	2013A	2014E	2015E
1Q	--	(0.34)A	(0.34)
2Q	--	(0.30)A	(0.34)
3Q	--	(0.32)	(0.29)
4Q	--	(0.32)	(0.33)
FY	(3.54)	(1.27)	(1.30)
FY P/E	NM	NM	NM

Revenue ($M) Diluted			
Full Year - Dec	2013A	2014E	2015E
1Q	--	0.00	0.00
2Q	--	0.00	0.00
3Q	--	0.00	0.00
4Q	--	0.00	0.00
FY	0.97	0.00	0.00



Investment Opinion. We are initiating coverage of Fate Therapeutics, Inc. with a Buy rating and a target price of $9 based on a discounted earnings per share and revenue multiple analysis. Fate's core biotechnology franchise is based on pharmacological modulators of stem cells. The company's lead therapeutic candidate, PROHEMA, utilizes umbilical cord blood that has been treated with dimethyl-prostaglandin E2 (dmPGE2) to enhance the engraftment potency of hematopoietic stem cells (HSCs) prior to transplantation in pediatric and adult patients. The company's pipeline is further bolstered by Wnt7a protein analogs and induced Pluripotent Stem Cell (iPSC)-derived myogenic progenitor cells (iMPCs) for muscle regeneration. With a diverse pipeline of small molecule modulators targeting both hematological malignancies and orphan diseases and a cash position of $42.0 MM ($2.05 per share at the end of 2Q14 which does not include a recent $10 MM in debt financing), we believe Fate Therapeutics represents an undervalued player with significant upside for the long-term investor.

Making Transplants More Efficient. According to the CIBMTR, cord blood accounted for 26% of allogeneic HSC transplants in patients under the age of 20. PROHEMA, the company's flagship product candidate is designed to improve cord blood transplants and has demonstrated statistically significant improvements in neutrophil engraftment rate. In addition, transplant patients demonstrated significantly lower levels of viral reactivation, which could lead to lower 100-day mortality rates and improved survival. Taken together, we believe PROHEMA could garner significant market share in the growing $1.4 billion cord blood transplant market.

Targeting Muscle Dystrophy. Wnt7a has been shown to be a modulator of satellite stem cells that drive muscle regeneration. Fate has created proprietary Wnt7a analogs that have demonstrated proof-of-concept in animal models of muscular regeneration, resulting in significant increases in muscle hypertrophy and muscle strength.

Platform Harnessing the Power of iPSCs. Fate Therapeutics is also developing a platform for the rapid generation, selection, and expansion of human iPSCs using small molecules. The platform generates iPSCs that have the ability to be manufactured commercially, and maintain a genetically stable cell population. The first therapeutic candidate to emerge from the iPSC platform could target degenerative muscle diseases and enter the clinic in 2016.

Valuation. In our opinion, the company's potential revenue stream justifies a premium to the current market capitalization. By applying both an 8X revenue and 28X earnings multiple analyses to our risk-adjusted 2022 revenues of $235 MM and EPS of $1.80 and using a discount rate of 30%, we derive a 12-month target price of $9.

Investment Summary

Fate Therapeutics, Inc., founded in 2007 and based in San Diego, California, is a regenerative medicine biotechnology company specializing in the development and commercialization of regenerative therapeutics for patients with life-threatening orphan diseases. The company's main platform technology employs a pharmacologic modulator of hematopoietic stem cells (HSCs). The flagship product, PROHEMA, utilizes umbilical cord blood that has been treated with dimethyl-prostaglandin E2 (dmPGE2) to increase potency of HSCs prior to transplant into patients who have undergone chemotherapy and/or radiation therapy for cancer. With PROHEMA, Fate Therapeutics has conducted two Phase 1 trials to evaluate the safety and preliminary efficacy of restoring hematopoiesis in patients who received reduced-intensity, non-myeloablative therapy. In published Phase 1 results, patients have demonstrated successful, durable engraftments with PROHEMA dmPGE2-modulated umbilical cord blood and accelerated neutrophil recovery relative to historical control groups. Fate is currently enrolling patients in the Phase 2 PUMA trial to gather additional safety and efficacy data for PROHEMA in adults. The Phase 1b PROMPT trial in pediatric patients is pending initiation. PROHEMA is also being explored in non-cancer indications, including demyelinating lysosomal storage disorders such as Hurler's syndrome and Krabbe's disease.

An additional preclinical program is exploring the use of Wnt7a as a protein therapy for muscular dystrophy, based on the preclinical observation that Wnt7a stimulates the expansion of endogenous, adult stem cells present in muscle tissue, leading to increased myocyte production. Further, Fate's iPSC platform centers on the use of small molecule modulators for inducing pluripotency in somatic cells that can subsequently be differentiated into a variety of cell types. Fate Therapeutics is currently developing iPSC-derived myogenic progenitor cells and assessing their therapeutic potential in models of degenerative muscle disease.

Valuation

We value Fate Therapeutics using a discounted earnings per share and revenue multiple analysis. Applying an 8x multiple to our risk (50%) adjusted 2022 revenues of approximately $235 MM and discounting by 30% over 7.5 periods, we obtain a $5.56 target price. Applying a 28x multiple to our 2022 earnings per share of $1.80 and discounting by 30% over 7.5 periods, we obtain a price target of $7.04. Averaging the results from these two methods and adding the projected cash per share in 12 months, we obtain a 12-month price target of $9.21, which we round to $9.

Newsworthy Events and Milestones For 2014-2015

PROHEMA in hematological maligancies:
- ✓ IND amendment approved for Phase 1b PROMPT trial in pediatric hematologic malignancies (2Q14)
- Potential to enroll first pediatric patient in Phase 1 PROMPT trial (3Q14)
- Potential for second iDMC review of PUMA (4Q14)
- Potential to present Phase 2 PUMA results (mid-2015)
- Potential to present Phase 1b PROMPT results (mid-2015)

PROHEMA in lysosomal storage disorders:
- ✓ IND approved for clinical development of rare metabolic disorders (2Q14)
- Potential to enroll first pediatric patient in a Phase 1b trial (4Q14)

Wnt7a protein therapy in muscular dystrophies:
- Potential to file IND for Wnt7a in muscular dystrophies (2015)

Risk Analysis

In addition to development, manufacturing, marketing, and financial risks associated with emerging regenerative medicine companies, specific additional risk factors to be considered are as follows:

Clinical/Regulatory Risk

Given its use, Fate Therapeutics will likely follow a standard BLA approval pathway for its lead therapeutic candidate of *ex vivo* manipulated allogeneic cells sourced from umbilical tissue. Currently, no randomized, placebo-controlled study has been completed with lead therapeutic candidate PROHEMA. Transplants using manipulated HSCs derived from umbilical cord tissue have never been approved by the FDA for any indication.

Commercial Risk

Fate Therapeutics' products may not obtain the market penetration and sales forecasted by our estimates or those of the company given the competitive marketplace and pricing dynamics in place in the US and EU. If approved for use in hematologic malignancies, treatment with PROHEMA may not be indicated for all patients requiring hematopoietic stem cell transplants.

Financing Risk

Fate Therapeutics has approximately $42.0MM ($52 MM pro forma if one accounts for the first tranche of the $10 MM Silicon Valley Bank tranche) in cash and cash equivalents at the end of 2Q14. In our opinion, the company has sufficient resources to fund operations until 2016. Assuming the company accesses a second $10 MM Silicon Valley Bank tranche in 4Q14, we believe the cash position is sufficient to fund operations through mid-2016. In the event that a partner cannot be found to offset operational costs, the company will likely need to seek additional dilutive financing options via the capital markets.

Market Risk

Transplants using unmanipulated stem cells present in cord blood have become a standard procedure for treating blood cell lineage disorders including leukemia, lymphoma, and anemia. Yet, clinical research substantiating the utility of cord blood stem cells for use in treating other diseases or injury has been minimal, leaving claims of broad clinical utility of cord blood stem cells by cord blood banks largely unsubstantiated. Lack of demonstrated clinical utility of cord blood derived stem cells beyond hematopoietic transplantation may result in a decline in demand for cord blood banking services, adversely affecting available source material for the PROHEMA treatment. The low utilization rate of banked cord blood samples coupled with the lack of demonstrated clinical results for multiple treatment indications has led to consumer skepticism regarding the benefits of cord blood banking and in turn, a significant reduction in collection rates in a number of geographies in Europe and the US. A continued lack of investment in the research and development of supporting clinical data for additional applications may lead to greater skepticism globally, thereby further adversely affecting demand for cord blood banking services.

Investment Highlights

Influencing the FATE of Hematopoietic Regeneration

- Fate Therapeutics is developing PROHEMA to boost the engraftment potency of HSCs in umbilical cord blood, potentially making the umbilical cord blood a better source of HSCs for restoring hematopoiesis in patients who have received myeloablative or reduced intensity (non-myeloablative) treatments. HLA-typed, cryopreserved cord blood is available globally in tissue banks, but untreated cord blood units lack sufficient HSCs to successfully restore hematopoiesis in most patients. PROHEMA involves an *ex vivo* treatment of ≥4/6 HLA-matched cord blood units with dmPGE2, potentially increasing the ability of HSCs to successfully engraft into a recipient.

- Final Phase 1 (FT1050-01) results utilizing a historical control group were published in 4Q13. In this trial, reduced-intensity chemotherapy patients received PROHEMA in addition to an untreated cord blood backup unit. After establishing safety and optimizing dmPGE2 incubation protocols, 10 of the 12 patients in a Phase 1 cohort displayed successful, durable engraftment of the PROHEMA cord blood unit with a 100% survival rate at Day 100. The remaining two had successful primary grafts, but the graft originated from the untreated cord blood. The cohort's median neutrophil recovery time was accelerated relative to a historical control group (17.5 days vs. 21 days, p=0.045). Further, the median time to platelet engraftment was 43 days and 11 of the 12 patients had engrafted platelets by day 60.

- Additional analysis of the FT1050-01 results indicates the PROHEMA may offer beneficial effects on T-cell populations. Specifically, patients receiving PROHEMA had a two-fold increase in naïve and early memory T cells within the $CD8^+$ T-cell compartment relative to patients who received untreated cord blood transplants. Naïve and early memory T-cells populations are believed to promote immune reconstitution and viral immunity following transplantation, and patients receiving PROHEMA displayed low rates of viral reactivation relative to historical controls (e.g. 16% cytomegalovirus reactivation rate vs. 36-56% literature values).

Ongoing Clinical Studies to Drive Value

- In 1Q14, Fate began enrollment in its adult, Phase 2 PUMA clinical trial of PROHEMA in patients with hematological malignances at ten different sites. The 2:1 randomized, open-label study is designed to assess the efficacy and safety of transplants including PROHEMA relative to untreated cord blood. The trial is being run at ten major HSC transplant centers in the US, and targets to enroll up to 60 patients. The primary endpoint is time to neutrophil engraftment, assessed within 60 days of treatment. Fate expects to report efficacy data on this endpoint mid-2015.

- In 3Q14, an independent data monitoring committee (iDMC) conducted the first of two scheduled interim reviews of the PUMA trial to assess safety, time to engraftment, rates of graft failure, early mortality, infection, and graft versus host disease (GvHD). The review included seven patients that received PROHEMA plus an unmanipulated cord blood unit and three control patients that received two unmanipulated cord blood units. The iDMC did not identify any safety signals and based on its consideration of the data available on the first ten patients, supported continuation of the PUMA study. A second data review by the iDMC is expected after the first 12 patients have received PROHEMA treated blood, and is likely to occur before the end of 2014.

- Fate plans to begin enrollment of the pediatric Phase 1b PROMPT study, which targets to enroll up to 18 patients, between the ages of 1 and 18, at three leading US pediatric transplant centers in 3Q14.

PROHEMA Moving Towards Orphan Genetic Disorders

- At the end of 2Q14, Fate submitted an IND application to evaluate PROHEMA in rare, hereditary metabolic disorders. The IND has been cleared by the FDA, and the company plans to initiate a Phase 1b trial of PROHEMA in pediatric patients where enzyme replacement therapy is not a viable therapeutic option.

Therapeutic Candidate Emerges from iPSC and Wnt7a Platforms

- The company is currently preclinically optimizing the generation of iMPCs, which have the potential to complement its Wnt7a protein analogs program for muscle regeneration. Induced pluripotency has attracted considerable excitement in the scientific community, and a 2012 Nobel Prize in Medicine was awarded for the discovery that mature cells can be reprogrammed into a pluripotent state.

Strong Intellectual Property Portfolio and Loans Help to Protect the Franchise

- Fate has a strong IP portfolio that currently includes 70 issued patents and 200 patent applications licensed from academic and research institutions. Fate owns 50 patents and patent applications, bestowing the company with the rights to develop product candidates in the US and worldwide. Fate's IP portfolio protects all therapeutic candidates currently in clinical development, in addition to much of Fate's preclinical pipeline.

- In 3Q14, the company entered into an Amended and Restated Loan and Security Agreement with Silicon Valley Bank (SVB), under which SVB agreed to loan up to $20 MM to Fate Therapeutics, of which $10 MM was immediately available. The first $10 MM tranche of the debt facility yielded net proceeds of $8.8 MM. The second $10 MM tranche is tied to advancement of the PUMA trial and is expected upon the second data review by the iDMC, likely to occur before the end of 2014.

FATE THERAPEUTICS PORTFOLIO

Treatment	Phase	Potential Indications	Rights
PROHEMA	Phase 2	Hematologic Malignancies (US)	FATE
	Phase 1	Rare Metabolic Disorders (US)	FATE
Wnt7a analogs	Preclinical	Muscular Dystrophies (US)	FATE
iMPCs	Preclinical	Muscle regeneration (US)	FATE

Source: Company Reports; H.C. Wainwright

INVESTMENT PROS AND CONS

The major investment pros and cons, as we see them, are summarized in the following table:

POSITIVES
Lead product potentially addresses unmet global medical needs
Orphan drug status in secondary indications
Pipeline with multiple products in various stages of early clinical development
Encouraging Phase 1 efficacy data

NEGATIVES
No FDA approved product
Small consumer base and market potential for secondary indications
No late stage products or source of revenue
No randomized, placebo-controlled studies completed

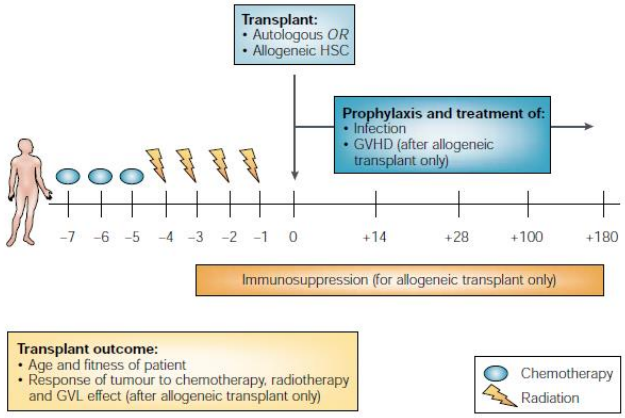
Source: H.C. Wainwright

Scientific Overview and Background

Scientific Background on Bone Marrow Transplant for Hematologic Malignancies

Bone marrow transplantation is standard therapy for providing new hematopoietic stem cells to patients with leukemia. Prior to transplantation, patients receive myeloablative or non-myeloablative, reduced intensity chemotherapy and/or radiation treatment to kill both cancer cells and by default, hematopoetic cells. This procedure is followed by an infusion of HSCs to reconstitute the patient's bone marrow and immune system (see Figure 1). Generally, HSCs (with stemness defined by surface markers $CD34^{+}$, $CD59^{+}$, $Thy1^{+}$, $CD38^{low/-}$, c-$kit^{-/low}$, and lin^{-})[1] can be sourced autologously or allogeneically, but in cancer patients, autologous transplantations are often avoided due to stem cell damage from previous chemotherapy and the potential contamination with malignant cells. Unlike allogeneic transplants, leukocytes derived from autologous HSCs are unlikely to contribute to a beneficial "Graft vs. Tumor" immune response against cancer cells which can lower the risk of relapse. Therefore, in many patients with hematological malignancies, congenital disorders and bone marrow failure, allogeneic HSCs are the only curative option.

Figure 1: A Typical Timeline for HSC Transplant Following Chemoradiation Treatment



Source: Nat Rev Cancer. 2003; 3(7):526-532

[1] http://stemcells.nih.gov/info/scireport/pages/chapter5.aspx

Currently, mobilized peripheral blood (mPB) is the predominant source of HSCs for use in transplants. Importantly, HSCs can be found in different tissue sources besides mPB, including bone marrow and umbilical cord blood. Adult peripheral blood and blood derived from umbilical cord and placental tissue also contains HSCs. Relative to mPB, bone marrow and umbilical cord blood contain relatively few HSCs, and while readily available, is not always ideal for restoring hematopoiesis. Cord blood, also relatively deficient in HSCs, offers several advantages over mPB and bone marrow. Cord blood has relatively high availability because it can be easily collected at the time of childbirth, characterized for relevant antigens, and cryopreserved in cord blood banks until needed. Interestingly, transplantation of cord blood is associated with reduced incidence of Graft vs. Host Diseases (GvHD), a common complication of allogeneic cell tissue transplants (see Figure 2). The reason for reduced GvHD incidence is not fully understood, but is likely attributable to differences in cell phenotypes in cord blood relative to those found in bone marrow, including differences in proliferative and cytotoxic responses of T-cells, and differences in NK T-cell and dendritic-cell biology.[2]

Figure 2: Cord Blood HSC Transplants Cause Fewer GvHD Cases

Comparison of umbilical-cord blood transplantation with bone-marrow transplantation

Type of stem cell	Days to neutrophil recovery	Neutrophil recovery % by day 60	Platelet recovery % by day 180	% of patients develop grade II–IV acute GVHD by day 100	% of patients who have chronic GVHD by 3 years	% surviving patients after 3 years
UCB cells (n = 113)	26 days	89%	86%	14%	6%	64%
BM cells (n = 2,052)	18 days	98%	96%	24%	15%	66%

BM cells, bone-marrow cells; GVHD, graft-versus-host disease; UCB cells, umbilical-cord blood cells.

Source: Nat Rev Cancer. 2003; 3(7):526-532

HLA Typing

Human Leukocyte Antigen (HLA) typing is a standard practice for identifying a suitable donor with minimal risk of causing immune complications in an allogeneic tissue transplant scenario. HLA matching is also critical for the engraftment success. Differences in histocompatibility antigens, especially the HLAs, between donor and recipient can lead to a potentially serious complication called GvHD. GvHD is a highly dangerous complication following an allogeneic tissue transplant and the consequences of this immunogenic attack on the implanted tissue include severe skin rash, liver enzyme elevation, jaundice, difficulty breathing, gastrointestinal ailments, and compromised joint movement.[3]

HLA genes are highly polymorphic and are inherited as a haplotype unit from each parent. Each haplotype contains four HLA loci: HLA-A, HLA-B, HLA-C, and HLA-DRB1. HLA typing of the recipient and donor is accomplished by characterizing HLAs through a combination of methods. HLA-A, HLA-B, HLA-C antigens may be categorized by relatively "low-resolution" serological techniques, whereas the HLA-DRB1 antigens are more often assessed by "high resolution" techniques such as sequencing. Within a family, siblings have a one in four chance of inheriting the same HLA haplotypes. Unfortunately, unrelated individuals are extremely unlikely to have significant sequence identity at HLA loci. A donor with high levels of sequence identity for all eight HLA loci (two loci from each haplotypes) would be considered a perfect 8/8 match to the patient. Donors with mismatching HLAs at one or two loci would be considered a 7/8 match or a 6/8 match, respectively. Most transplant centers require a minimum of a 7/8 match for adult bone marrow transplants, and some require a 8/8 match. Due to these stringency requirements, some patients are unable to locate a suitable donor in the timeframe dictated by the progression of their cancer.

[2] Boxmeyer. In Boxmeyer, ed. *Cellular Characteristics of Cord Blood and Cord Blood Transplantation.* Bethesda, MD: AABB Press; 1998:67–81

[3] *The Lancet*. 2009;373(9674): 1550-1561

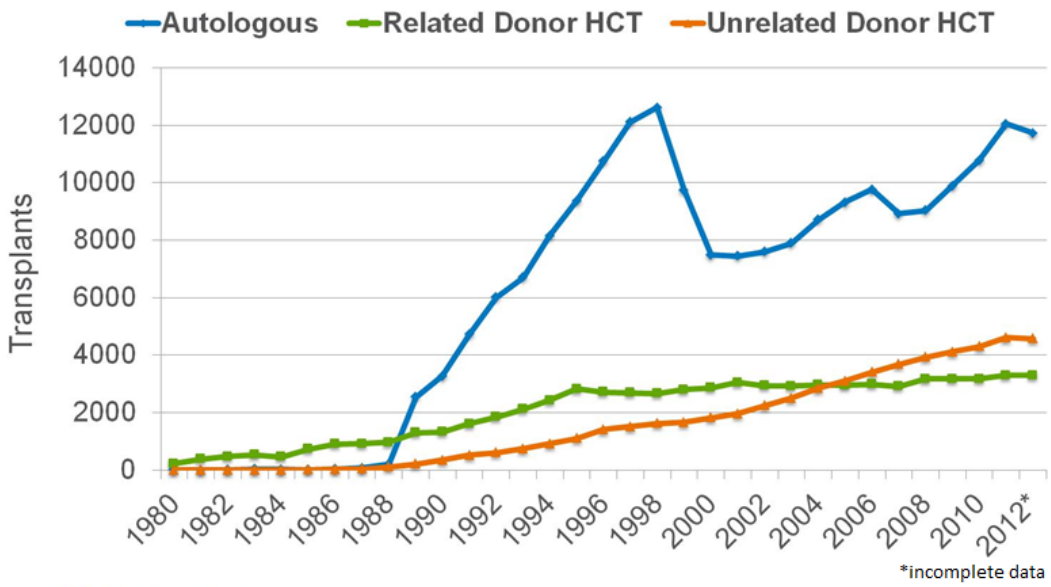
Notably, cord blood displays less alloreactivity than bone marrow, HLA typing in cord blood usually uses only 6 markers—the two HLA-C loci are not included.[4] Typically, cord blood units that are 4/6 matches or better are considered suitable for transplant, meaning a patient is considerably more likely to find a HLA matched cord blood unit than an adult marrow donor. Transplants with cord blood units have seen the greatest success in pediatric patients who do not require more than one unit of blood; adult patients typically require multiple units to successfully restore hematopoiesis, potentially compounding the difficulty of locating suitable HLA matches.

US HSC Transplant Activity

The Center for International Blood and Marrow Transplant Research (CIBMTR) compiles data on the number of allogeneic HSC transplants performed in the US (see Figure 3). While autologous transplant data are reported on a voluntary basis, the CIBMTR numbers for allogeneic transplants are likely reflective of actual US transplant activity. Likely stemming from improvements in HLA-typing methodology, allogeneic transplants from unrelated donors surpassed the number of allogeneic transplants from related donors after 2006 and continue to gain "market share" in the US.

Globally, CIBMTR estimates approximately 25,000 HSC transplants are performed annually, with nearly 50% of these procedures resulting in acute GvHD,[5] and approximately 5% of acute GvHD cases progressing to severe GvHD which is refractory to treatment with steroids.[6] Currently, no approved therapies are specifically indicated for GvHD, and the standard of care is corticosteroids. In cases where GvHD does not respond to corticosteroids, the mortality rate exceeds 90%. In cases of imperfect HLA matching, the immunosuppressant cyclosporine is a commonly prescribed prophylactic.

Figure 3: Hematopoietic Transplants in the US

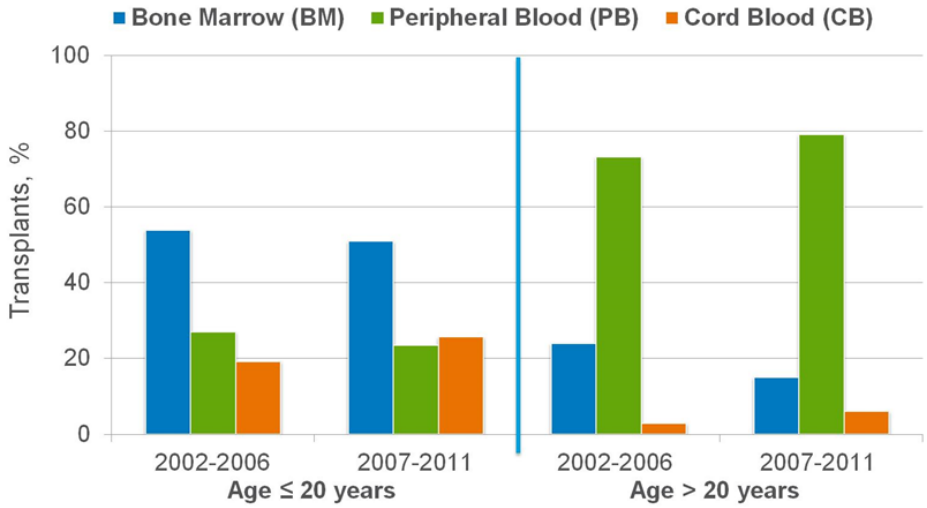


Source: Center for International Blood & Marrow Transplant Research

[4] http://bethematch.org/For-Patients-and-Families/Finding-a-donor/HLA-matching/
[5] http://www.cibmtr.org/ReferenceCenter/SlidesReports/SummarySlides/pages/index.aspx
[6] *Adv Hematol*. 2011; doi: 10.1155/2011/601953

Cord blood transplantations, first pioneered in 1988, have steadily increased in popularity. According to the CIBMTR, from the period of 2007-2011, cord blood accounted for 26% of allogeneic HSC transplants in patients under the age of 20. Between 2002 and 2011, cord blood use in patients more than 20 years old doubled from 3% to 6%. A breakdown of the relative use of the three major HSC source tissues is shown in Figure 4.

Figure 4: Use of Bone Marrow, Peripheral Blood, and Cord Blood in Allogeneic Transplants



Source: Center for International Blood & Marrow Transplant Research

Approved Therapies

As previously discussed, allogeneic HSC transplantation is often the only therapeutic option for patients with blood cancers, congenital defects, and bone marrow failure arising from other conditions. Unmanipulated HCSs present in bone marrow, peripheral blood, and umbilical cord blood are approved for use in restoring hematopoiesis. While mPB and bone marrow are the primary sources of HSCs used today in HSC transplants, these sources are frequently limited by donor unavailability, and can be subject to serious complications including GvHD and opportunistic infections.

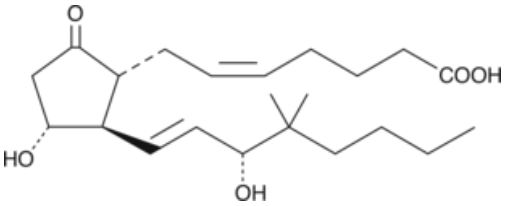
Relative to adult peripheral blood or bone marrow, unmodified cord blood actually contains a greater proportion of highly proliferative HSCs, possibly due to placental production of growth factors such as granulocyte colony-stimulating factor. However, relative to other sources of HSCs, cord blood contains 10-100 fold fewer nucleated cells/kg. A standard bone marrow transplant procedure utilizes approximately $3x10^8$ nucleated cells/kg, including $2.5x10^6$ $CD34^+$ cells/kg and $35x10^6$ $CD3^+$ T-cells/kg. In contrast, a pediatric cord blood transplant typically utilizes only $0.35x10^8$ nucleated cells/kg, including $0.35x10^6$ $CD34^+$ cells/kg and $8x10^6$ $CD3^+$ T-cells/kg.[7] Despite low cell counts, myeloid and lymphoid reconstitution occurs because the cord blood is a potent source of HSCs. In terms of absolute cell count, unmodified cord blood units typically contain only about 10% of the $CD34^+$ cells relative to bone marrow preparations. To partially compensate for fewer HSCs, two umbilical cord blood units are routinely used in adult transplant procedures, while pediatric patients typically receive one unit. Even so, successful engraftment following cord blood transplantation remains less frequent than for bone marrow transplants (see Figure 2). In an effort to improve engraftment success rates with cord blood, Fate Therapeutics is developing a novel approach for boosting HSC potency in cord blood prior to transplant.

[7] *Nat Rev Cancer.* 2003.;3(7):526-532

PROHEMA

Fate's PROHEMA program is based on the empirical observation that the exposure of umbilical cord blood to a small molecule, 16,16-dimethy prostaglandin E2 (dmPGE2, Figure 5), influences HSC homeostasis and increases cord blood engraftment potency *in vivo*.[8,9] Originally identified as a small molecule that dramatically increases HSC levels in zebra fish embryos, dmPGE2 was also shown to enhance cord blood engraftment in multiple animal models.[10,11] Mechanistically, dmPGE2 is believed to enhance HSC potency by activating GPCRs including PTGER2 and PTGER4, which increases the expression of genes involved in homing, proliferation, and survival.[12]

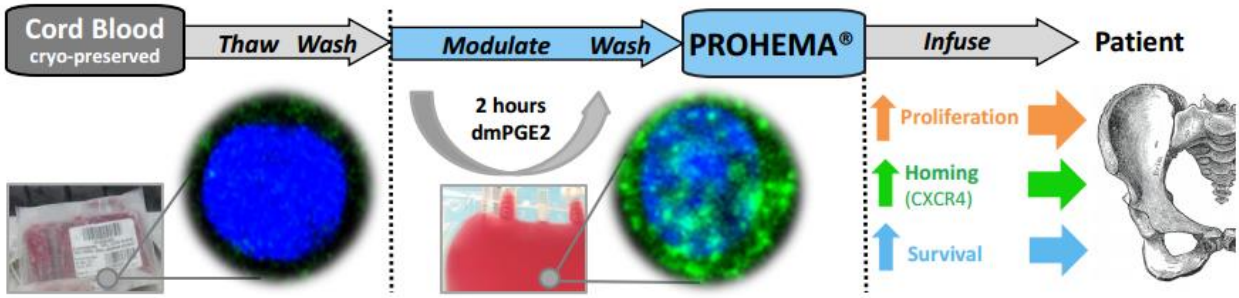
Figure 5: Chemical Structure of dmPGE2



Source: Cayman Chemical, Inc.

The PROHEMA process, depicted in Figure 6, involves a two hour incubation of HLA-matched cord blood units with dmPGE2 prior to transplantation.

Figure 6: Overview of PROHEMA Treatment



Source: Fate Therapeutics, Inc.

PROHEMA Clinical Trials for Hematologic Malignancies

PROHEMA is in Phase 2 clinical development in patients with hematological malignancies. Fate has completed two Phase 1 studies in patients receiving cord blood transplantation, is conducting a Phase 2 study in adults, and expects to initiate a Phase 1b study in pediatric patients later this year. Final data from the first Phase 1 trial, summarized below, suggests efficacy.

[8] *Nature* 2007; 447: 1007–1011
[9] *Blood Cancer Journal* 2014; 4:e178
[10] *Cell Stem Cell*. 2011;8(4):445-458
[11] *Blood Cells Mol Dis.* 2014;53(1-2):34-38
[12] *Blood.*2009;113(22):5444-5455

Summary of Phase 1 FT1050-01 Trial

Final published results[13,14] are available from a 21-patient, adult, open-label, non-randomized Phase 1 trial (Clinicaltrials.gov #NCT00890500). The study was conducted to determine the safety and efficacy of a two-unit umbilical cord blood transplantation with one of the cord blood units subjected to the PROHEMA procedure. Patients included were those who had hematological malignancies and received reduced-intensity, non-myeloablative therapy but could not find a matched donor. Patients were divided into two study arms—each receiving the same chemotherapy regimen. The major difference between the arms was the PROHEMA protocol used; in the first cohort, a shorter and colder (60 min at 4°C) dmPGE2 incubation was used, whereas patients in the second cohort used a modified incubation procedure (120 min at 37°C). The first six patients enrolled in the trial (all in cohort 1) had the smaller of two cord blood units modified with the PROHEMA treatment, while the remaining 15 patients had the larger of the two units modified, based on total nucleated cell count before cryopreservation. The trial's primary endpoint was safety at two years, with engraftment success, time-to-engraftment, fractional chimerism, and incidence of GvHD serving as secondary endpoints. Patient demographics and characterizations of cord blood units included in the trial are summarized in Figure 7. The two cohorts were compared against a historical control group, consisting of similar patients treated with two unmodified cord blood units.

Figure 7: Patient and Cord Blood Characteristics from FT1050-01 Trial

Patient characteristics	Cohort 1			Cohort 2		
Sample size (n)	9			12		
Median age, y (range)	43.0 (29-64)			57.5 (19-66)		
Male gender, n (%)	4 (44.4)			8 (66.7)		
Median weight (kg, range)	73.8 (44.7-126)			78.7 (48.7-149.6)		
Primary malignancy, n (%)						
AML	3 (33.3)			5 (41.7)		
MDS	2 (22.2)			4 (33.3)		
NHL/CLL	2 (22.2)			3 (25.0)		
ALL	2 (22.2)			0		
Prior autologous transplant, n (%)	2 (22.2)			2 (16.7)		
CMV seropositive, n (%)	7 (77.8)			7 (58.3)		
UCB unit characteristics	**$dmPGE_2$-UCB**	**Untreated UCB**	***P***	**$dmPGE_2$-UCB**	**Untreated UCB**	***P***
HLA match						
4/6	8	8	NS	10	8	.64
5/6	1	1		2	4	
Precryopreservation						
TNC ($\times 10^7$/kg)	3.03	2.53	.43	2.64	1.95	.02
$CD34^+$ ($\times 10^5$/kg)	1.58	1.54	.79	1.21	1.01	.69

ALL, acute lymphoblastic leukemia; AML, acute myeloblastic leukemia; CMV, cytomegalovirus; GM, granulocyte-macrophages (in CFUs); MDS, myelodysplastic syndrome; NHL/CLL, non-Hodgkin lymphoma/chronic lymphocytic leukemia.

Source: Blood. 2013; 122(17):3074-3081

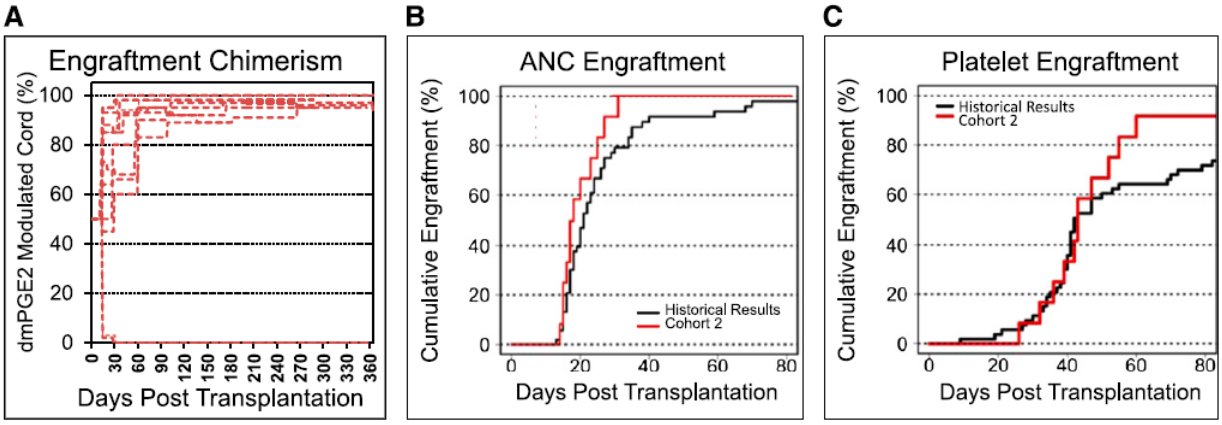
In the first cohort, only seven of nine patients displayed successful primary engraftments. In this cohort, the PROHEMA treatment offered no improvement in median time to neutrophil or platelet recovery relative to the historical control group, and the seven successful engraftments displayed no skew toward the PROHEMA-treated unit, based on graft chimerism analysis. The median times to neutrophil and platelet engraftment were 24 and 72.5 days, respectively.

[13] *Blood*. 2013;122 (17): 3074-3081
[14] *Blood Cancer Journal*. 2014;4:e178

The 12 patients in the second cohort were treated according to the optimized *ex vivo* dmPGE2 modulation protocol (10 µM of dmPGE2, 120 min exposure at 37°C in LMD/HSA media). Like cohort one, the majority of cohort two patients received two cord blood that were 4/6 HLA matched to each other and the patient. Treatment-related adverse events (chills, flushing, abdominal pain, and cough) were observed in four patients, and one patient with pre-existing coronary artery disease displayed transient, grade 4 ST-elevation after infusion and evidence of myocardial ischemia, based on cardiac troponin levels.

Notably, patients in cohort 2 exhibited encouraging efficacy data, summarized in Figure 8. All 12 patients in this cohort had successful primary engraftments, with 10 of 12 grafts attributable to the PROHEMA treated unit, based on graft chimerism assessment. The median time to neutrophil engraftment was significantly shorter than the historical control group (17.5 days vs. 21 days, p=0.045). The median time to platelet engraftment was 43 days, with 11 of the 12 patients showing platelet recovery by day 60.

Figure 8: Summary of PROHEMA Efficacy Data in Cohort 2



Source: Blood. 2013; 122(17):3074-3081

Interestingly, further analysis of the Phase 1 data revealed that *ex vivo* dmPGE2 treatment improves the survival and immunological properties of T-cells in a Wnt/β-catenin signaling dependent manner.[15] Specifically, patients who received PROHEMA-treated cord blood had an approximate two-fold fractional increase in the subpopulations of naïve and early memory T cell fractions within their $CD8^+$ T-cell compartments. These subpopulations are believed to play a central role in promoting immune reconstitution and viral immunity following cord blood transplantation. This is supported by the observation that patients receiving PROHEMA-treated cord blood had low rates of viral reactivation relative to historical controls (e.g. 17% cytomegalovirus reactivation rate vs. 36-56% literature values; and there were no observed cases of Epstein-Barr virus-associated post-transplant lymphoproliferative disorders compared to a literature rate of 16%).

During the course of the study, three participants relapsed and subsequently died. A total of six patients developed GvHD in varying degrees of severity and a total of four patients died of transplant related complications. Additionally, one patient committed suicide. With a 24.6 month median follow-up time amongst survivors, one and two year PFS rates were 61.7% and 31.3%, respectively. The corresponding one and two year OS rates were 75% and 38.9%, respectively. As a reminder, participants in this trial received reduced intensity, non-myeloablative chemotherapy prior to transplant.

[15] *Blood Cancer Journal.* 2014;4: e178

Phase 2 PUMA Trial Summary

Fate is currently conducting a Phase 2 PUMA trial in adults (Clinicaltrials.gov #NCT01627314), with a targeted enrollment of 60 patients. The open-label, randomized study is designed to include patients who are receiving both fully myeloablative and reduced intensity conditioning. Again, the trial is using a two-unit procedure, including a single PROHEMA-treated cord blood unit and an unmodified unit. The study is being conducted at approximately 10 transplant centers in the US, and approximately 40 subjects will receive mixed PROHEMA/unmodified units as part of a double transplant, while an additional 20 subjects will receive unmodified units only, according to the study protocol. The primary endpoint is predefined as time to neutrophil engraftment. Secondary endpoints include measures of engraftment success at 180 days, in addition to graft failure rates, serious adverse event such as GvHD, PFS, and OS. Final data from the PUMA trial are expected in mid-2015.

Phase 1b PROMPT Trial in Pediatric Hematological Malignances

Fate has announced an upcoming Phase 1b "PROMPT" trial for PROHEMA in pediatric patients. The study targets an enrollment of up to 18 patients, all less than 18 years of age. The PROMPT study uses an open-label design involving single cord blood units transplanted into patients following myeloablative conditioning. The company indicates PROMPT's primary endpoint will be safety as assessed by neutrophil engraftment, and several secondary endpoints include additional measures of neutrophil engraftment, platelet engraftment, rates of graft failure, adverse events, PFS, and OS. Enrollment of the first patient is expected in 3Q14.

Competitive Landscape: Investigational Therapies for Bone Marrow Regeneration

Cesca Therapeutics

Cesca Therapeutics (KOOL; Buy) is developing technology to allow patients who are unable to find suitable HLA-matched donors to receive HSC transplants from a parent or sibling, who would not otherwise be considered an acceptable match. Cesca's haploidentical program involves removing unwanted cells from donor tissue through a GMP process. Utilizing a GMP facility in a hospital run by partner Fortis Healthcare, Cesca is developing a cell selection process that can be optimized for creating a transferable standard methodology co-packaged with Cesca's cell processing hardware and software.

In the case of blood type (ABO) mismatches, donor/recipient compatibility can be sometimes increased by removing erythrocytes cells from donor tissue. Under standard protocols, this process also inadvertently depletes HSCs from the donor tissue. With a reduced HSC count, transplant patients take longer to recover hematopoiesis and are at increased risk of illness and potential death. Cesca's system for erythrocyte depletion systems may effectively address the inadvertent stem cell loss, with HSC yields (between) 30% to 40% higher than achievable with conventional methods, potentially leading to enhanced engraftment rates. Additionally, depletion of the T-cell receptor alpha beta cells, commonly referred to as TCR depletion, can reduce the incidence of GvHD imperfectly matched transplant recipients. Cesca is currently evaluating its cell processing technology for improving donor tissue compatibility in two, ten-patient pilot studies. Additionally, Cesca is a major supplier in the cord blood processing space.

Gamida Cell

A direct competitor to Fate, Gamida Cell (private) is developing two investigational therapies: NiCord and StemEx, which utilize umbilical cord cells that have been expanded *ex vivo* using different proprietary technologies.

StemEx is being developed with partner Amgen (AMGN; not rated), and involves HSCs expanded from portion of a single cord blood unit. The expanded cells are transplanted into patients in combination with non-expanded cells from the same blood unit. In the StemEx process, *ex vivo* expansion is dependent on Gamida's copper chelator technology. Results from a 101 patient Phase 2/3 trial of StemEx in patients with hematological malignancies were reported in 2013, indicating statistically significant improvements relative to a historical control group in 100-day mortality (15.8% vs. 24.5%, p=0.035), median time-to-neutrophil engraftment (21 days vs. 28 days, p<0.0001), and median time to platelet engraftment (54 days vs. 105 days, p=0.008). However, the study failed to achieve statistical significance in other endpoints including graft failure rates (8.1% vs. 14.5%, p=0.086), 180-day mortality (32.7% vs. 34.7%, p=0.39), and incidence of acute GvHD (19.4% vs. 16.9%, p=0.11). The FDA has advised Gamida and Amgen that it will require a randomized, experimentally controlled Phase 3 trial before it can consider approval of StemEx.

Gamida's other therapeutic candidate, NiCord, uses nicotinamide in the *ex vivo* expansion procedure, and is currently being evaluated for use in dual- and single-unit transplants. At the 2013 American Society of Blood and Marrow Transplantation Meeting, Gamida presented Phase 1/2 interim results from an 11 patient, uncontrolled trial in patients who received myeloablative conditioning. Patients received two units of umbilical cord blood including one expanded with the NiCord methodology, along with a second unmanipulated unit. A total of eight patients successfully engrafted with the NiCord unit, two engrafted with the unmodified unit, and one patient had a chimeric graft. One patient experienced primary graft failure. The median time to neutrophil engraftment was 12.5 days for the entire cohort, and 10.5 days for the subset engrafting with NiCord. The estimated 100-day treatment-related mortality was 10%. PFS and OS at eight months were both 90%, and three patients developed acute GvHD. Gamida has initiated another Phase 1/2 trial to evaluate the safety and efficacy of the NiCord treatment in single unit transplants.

Novartis/Regenerex

In 3Q13, Novartis (NVS; not rated) entered into a licensing and research collaboration with Regenerex LLC (private), for use of Regenerex's Facilitating Cell Therapy (FCRx) platform. Using Regenerex technology, Novartis is developing HSC-835, a treatment involving expanded cord blood HSCs, as a therapeutic candidate for patients with hematological malignancies requiring HSC transplants. Novartis has announced a first-in-human, Phase 1/2 trial with a single arm, open-label design to evaluate the safety of HSC-835. The trial targets an enrollment of 18 patients, with measures of infusional toxicity and graft failure rate serving as primary endpoints. Additional endpoints include neutrophil and platelet recovery rates, 100-day mortality, GvHD incidence, OS, and disease free survival at 100 days.

Pluristem

Pluristem Therapeutics' (PSTI; Buy) PLacental eXpanded (PLX) platform is currently in preclinical development as a therapeutic option for patients with hematological malignancies.

Analysis of Competitive Landscape

We believe PROHEMA is well positioned take advantage of existing cord blood banking infrastructure and could potentially make the cord blood banks a more widely used resource. In our opinion, Fate Therapeutics and PROHEMA have distinct advantages overs competing investigational therapies utilizing umbilical cord blood such as StemEx, NiCord, and HSC-835. Importantly, PROHEMA is a fast treatment that does not require *ex vivo* expansion of cells. Further, we believe Fate can streamline and optimize its clinical trial design using the lessons learned from the 101-patient trial of StemEx, which failed to achieve statistical significance in graft failure rate and 180-day mortality endpoints. Based on the above data, we believe PROHEMA is further along in clinical development than NiCord or HSC-835, and could potentially reach commercialization before the competition.

However, we acknowledge that several companies are pursuing development of specific therapies to address GvHD. Successful development of effective GvHD treatments may mitigate the demand for alternative sources of HSCs, including PROHEMA. Candidate therapies currently in late stage clinical development include Mesoblast's (MSB; not rated) mesenchymal stem cells and Jazz Pharmaceuticals' (JAZZ; not rated) defibrotide.

Financials

Revenues

Based on the current stage of development of PROHEMA in hematopoietic regeneration, we project commercial launch could potentially occur in 2019. Based on statistics compiled by the CIBMTR on the number of allogeneic HSC transplants in the US and published estimates of worldwide HSC transplants (*JAMA*. 2010; 303(16):1617-1624), we estimate over 22,000 patients in the US and EU with hematological malignancies that could be suitable for treatment with PROHEMA cord blood. Assuming a treatment price of $40,000, comparable to the cost of a four-day treatment course of the peripheral blood stem cell mobilizer plerixafor (a small molecule used in autologous HSC transplants), the market size for PROHEMA in the US and EU could potentially exceed $900 MM by 2019. Assuming a robust peak market penetration for an effective alternative to conventional allogeneic bone marrow transplants, we estimate a peak market of $700 MM, yielding risk adjusted (50%) revenues of $56 MM in 2019, $101.5 MM in 2020, $163.1 MM in 2021, and $235.2 MM in 2022, as shown in the table below:

	2014	2015	2016	2017	2018	2019	2020	2021	2022
Hematopoietic Stem Cell Transplants from unrelated donors									
US Population ('000)	319,668	322,366	325,063	327,756	330,444	333,127	335,820	338,513	341,206
EU-25 population ('000)	466,660	467,300	467,700	468,100	468,500	468,900	469,400	469,900	470,400
Combinded EU+US population ('000)	786,328	789,666	792,763	795,856	798,944	802,027	805,220	808,413	811,606
EU+US Patients receiving allogeneic HSCTs (related+unrelated donors)	22,211	22,306	22,397	22,485	22,572	22,660	22,748	22,839	22,929
EU+US Patients receiving HSCTs from unreated donors	8,306	8,341	8,376	8,408	8,441	8,474	8,507	8,541	8,574
Market Size ($'s)	888,445,275	892,222,882	895,898,550	899,401,117	902,898,711	906,390,712	909,930,232	913,544,337	917,158,486
% Market penetration						16%	25%	39%	56%
Risk Adjusted Sales ($'000)						56,000	101,500	163,100	235,200

Source: HC Wainwright Research

Operating Expenses

Based on the R&D expenses reported for 2Q14, we are introducing the R&D estimates of $17.3 MM, $22.1 MM, $30.2 MM, $34.7 MM, $42.1 MM, $52.5 MM, $58.6 MM, $60.1 MM, and $63.5 MM for 2014-2022, respectively. The R&D assumptions from 2014-2022 take into account continued expenditure for Phase 2 and Phase 3 development of PROHEMA in hematological malignancies and rare genetic disorders, and continued development of Wn7a analogs and iMPC programs. We speculate that a 350 patient Phase 3 trial of PROHEMA in hematological malignancies could initiate in 2H15, potentially completing by 1H18.

Based on the SG&A expenses reported for 2Q14, we are introducing the SG&A estimates of $8.7 MM, $8.9 MM, $9.6 MM, $10.4 MM, $11.7 MM, $16.2 MM, $19.7 MM, $27.0 MM, and $39.6 MM for 2014-2022, respectively. These estimates include an increase associated with hiring a salesforce ahead of potential launch of PROHEMA in 2019.

Net Income and EPS

For 2Q14, Fate Therapeutics reported a net income (loss) of ($6.1) MM or ($0.30) per share. Going forward, we are introducing net income (loss) estimates of ($26.1) MM or ($1.27) per share, ($31.1) MM or ($1.30) per share, ($39.9) MM or ($1.45) per share, ($45.2) MM or ($1.19) per share, ($53.9) MM or ($1.40) per share, ($24.0) MM or ($0.62) per share, $2.8 MM or $0.06 per share, $42.3 MM or $0.90 per share, and $85.0 MM or $1.80 per share for 2014-2022, respectively, with the company potentially achieving profitability in 2020.

Cash

Fate Therapeutics concluded 2Q14 with approximately $42.0 MM in cash, cash equivalents (does not include the first tranche of $10 mm in debt financing), and marketable securities. Assuming the company accesses a second $10 MM SVB tranche in 4Q14, we believe the current cash position is sufficient to fund operations through mid-2016. We have included two dilutive cash raises in our model, including a $50 MM raise in 2H15, and a $100 MM raise in 1H17, which could sustain operations until the company potentially achieves profitability in 2020.

Valuation

Profitable biotechnology companies have historically traded in a multiple range of 6-10X revenues. We value Fate Therapeutics using a revenue multiple analysis. Applying an 8x multiple to our risk (50%) adjusted 2022 revenues of approximately $235 MM and discounting by 30% over 7.5 periods, we obtain a $5.56 target price.

Profitable biotechnology companies have historically traded in a multiple range of 26-30X EPS. We also value Fate Therapeutics using an earnings multiple analysis. Applying a 28x multiple to our 2022 earnings per share of $1.80 and discounting by 30% over 7.5 periods, we obtain a price target of $7.04.

Averaging the results from these two methods, we obtain an average target price of $6.30. Based on our projections, the company will likely require additional financing to sustain operations beyond mid-2016, and therefore have modeled a $50 MM raise in 3Q15 (adding an additional 6.25 MM in shares). Adding the projected cash per share in 12 months, we obtain a 12-month price target of $9.21, which we round to $9.

		Discount Rate							
		10%	15%	20%	25%	30%	35%	40%	45%
P/E Multiple	24	$21.11	$15.12	$10.99	$8.09	$6.03	$4.54	$3.46	$2.66
	26	$22.87	$16.39	$11.91	$8.77	$6.53	$4.92	$3.75	$2.88
	28	$24.63	$17.65	$12.82	$9.44	$7.04	$5.30	$4.04	$3.10
	30	$26.39	$18.91	$13.74	$10.12	$7.54	$5.68	$4.32	$3.32
	35	$30.78	$22.06	$16.03	$11.80	$8.79	$6.63	$5.04	$3.88
		10%	15%	20%	25%	30%	35%	40%	45%
Revenue Multiple	4.0	$9.74	$6.98	$5.07	$3.73	$2.78	$2.10	$1.60	$1.23
	6.0	$14.60	$10.46	$7.60	$5.60	$4.17	$3.14	$2.39	$1.84
	8.0	$19.47	$13.95	$10.14	$7.46	$5.56	$4.19	$3.19	$2.45
	10.0	$24.34	$17.44	$12.67	$9.33	$6.95	$5.24	$3.99	$3.07
	12.0	$29.21	$20.93	$15.21	$11.20	$8.34	$6.29	$4.79	$3.68
	14.0	$34.08	$24.41	$17.74	$13.06	$9.73	$7.33	$5.58	$4.29
	16.0	$38.94	$27.90	$20.28	$14.93	$11.13	$8.38	$6.38	$4.90
	18.0	$43.81	$31.39	$22.81	$16.80	$12.52	$9.43	$7.18	$5.52
	20.0	$48.68	$34.88	$25.35	$18.66	$13.91	$10.48	$7.98	$6.13

Discounted Earnings Analysis		
Estimated 2022 EPS	$	1.80
Year		2015
Periods (years)		7.5
Price target		**$7.04**

Discounted Revenue Analysis		
Estimated 2022 Revenues (000s)	$	235,200
Year		2015
Periods (years)		7.5
Shares outstanding (000s):		47,280
Price target		**$5.56**

Average Price Target Combining Both Methods	**$6.30**
Average Price Target Including Cash Per Share	**$9.21**

Source: HC Wainwright Research

Summary of Executives

CHRISTIAN WEYER, M.D., M.A.S.
President and Chief Executive Officer

Dr. Weyer is the President and Chief Executive Officer at Fate Therapeutics, and a member of the company's Board of Directors. Chris joined Fate in 2012 after a 12-year tenure with Amylin Pharmaceuticals, Inc., where he most recently served as Senior Vice President of Research and Development until the completion of Amylin's acquisition by Bristol-Myers Squibb in August 2012. During his tenure with Amylin, Chris contributed to the development, approval, and commercialization of several first-in-class diabetes medicines. In addition, he was instrumental in establishing multiple development programs and global strategic partnerships in diabetes, obesity and lipodystrophy, working in different leadership positions in research, clinical development, medical affairs, and corporate development. Prior to joining Amylin, he spent three years with the National Institutes of Health, NIDDK, in Phoenix, Arizona, where he conducted clinical research on the pathogenesis of obesity and type 2 diabetes. Chris earned his M.D. from the University of Düsseldorf, Germany, and holds a postdoctoral master's degree in clinical research from the University of California, San Diego. He has authored numerous original publications, review articles, and book chapters in the field of endocrinology and metabolism, and has served as a reviewer for multiple scientific journals.

PRATIK MULTANI, M.D., M.S.
Chief Medical Officer

Dr. Multani is the Chief Medical Officer at Fate Therapeutics. Prior to joining Fate Therapeutics in 2009, Dr. Multani had been Vice President of translational medicine at Kalypsys, Inc. since 2007, where he advanced the development of multiple compounds in the therapeutic areas of pain and inflammation and metabolic diseases. From 2005 to 2007 as Senior Vice President of Clinical Development and then Chief Medical Officer at Kanisa Pharmaceuticals, Dr. Multani led the clinical development of zosuquidar as well as a companion diagnostic for the treatment of acute myeloid leukemia. From 2004 to 2005 as Vice President of Clinical Development at Salmedix, he led three clinical development programs in hematologic malignancies and solid tumors. From 1999 to 2004, advancing from Associate Director of Oncology and Hematology to Senior Director of Medical Research at Biogen-Idec, Dr. Multani led or provided strategic direction for multiple drug development programs from pre-IND to Phase 4 clinical trials, including Zevalin and Rituxan. Pratik received his undergraduate degree from Yale University, his M.D. from Harvard Medical School and received post-doctoral training in epidemiology at the Harvard School of Public Health. He completed his Internal Medicine residency at the Massachusetts General Hospital followed by a medical oncology fellowship at the Dana Farber/Partners joint program, after which he was a member of the transplant unit at Massachusetts General Hospital.

SCOTT WOLCHKO
Chief Financial Officer and Chief Operating Officer

Mr. Wolchko has been the Chief Financial Officer and Chief Operating Officer of Fate Therapeutics since 2007 and is responsible for financial, business development, intellectual property and administration activities. Mr. Wolchko began his career as an investment banker with Morgan Stanley & Co., where he served for six years in the firm's New York City and Menlo Park, California offices. As a member of the firm's Investment Banking Health Care Group, he assisted emerging growth companies in the health care technology sector complete capital-raising and M&A transactions. Prior to joining Fate Therapeutics, Mr. Wolchko served as the Chief Financial Officer of Bocada, Inc., where he oversaw all corporate service-related operations, and was previously the Senior Director of Corporate Development at drugstore.com, where he was responsible for sourcing, evaluating and executing financial and business development opportunities. Mr. Wolchko holds an M.S. in biochemical engineering from the University of Virginia, and a B.S. in biomedical engineering from the University of Vermont.

DAN SHOEMAKER, PH.D.
Chief Technology Officer

Since 2009, Dr. Shoemaker has been Fate's Chief Technology Officer and is leading the company's drug discovery efforts. Dr. Shoemaker was previously Chief Scientific Officer of ICx Biosystems, which develops advanced detection technologies for use in biodefense, cancer and prenatal diagnostics. He led the technology team in establishing molecular tools to enrich and analyze rare cell populations. From 2003 to 2005, he was Chief Scientific Officer of GHC Technologies and led the research and development of rapid ultrasensitive detection assays for biodefense and clinical point-of-care diagnostics. From 1998 to 2003, Dr. Shoemaker held several positions at Merck Research Laboratories, including Director of Target Discovery, Senior Director at Rosetta Inpharmatics and Research Fellow in the Department of Molecular Neurosciences, where his main focus was on target identification and biomarker discovery. Dr. Shoemaker's research at Merck achieved publications in top journals, including Nature, Science, and Nature Biotechnology. Dr. Shoemaker received his Ph.D. in biochemistry from Stanford University and his B.S. in biochemistry from University of California, Santa Barbara.

PETER FLYNN, PH.D.
Senior Vice President of Early Program Development

Since 2009, Dr. Flynn has been the Senior Vice President of Early Program Development at Fate Therapeutics. He manages the *in vivo* protein therapeutics pipeline and preclinical development and the iPSC technology group, including the collaboration with Becton Dickinson (BD). Peter has been involved in biotechnology start-ups with a focus on biologic therapeutics for over ten years. Prior to joining Fate Therapeutics, he was Vice President of Research for Ren Pharmaceuticals, where he led the R&D effort to identify biologic therapeutics to treat renal disease and hypertension. Prior to Ren, Peter was Director of Biochemistry Research at KaloBios Pharmaceuticals, an antibody therapeutics company. Peter was a member of the KaloBios team from incorporation and was integral in the development of the platform antibody HumaneeringTM technology. Peter played a major role in the identification and preclinical development of KaloBios' three initial therapeutic antibodies for the treatment of infectious disease, inflammation, and cancer. Prior to the formation of KaloBios, Peter was a researcher at UCSF Comprehensive Cancer Center. He gained a Ph.D. from the ICRF London (Cancer Research UK) and a B.Sc. in molecular biology from University College London. He is the author of many publications and patents in the areas of cellular signal transduction, antibody engineering, and induced pluripotency.

CINDY TAHL, J.D.
Vice President of Intellectual Property and Senior Corporate Counsel

Since 2009, Cindy Tahl has been the Vice President of Intellectual Property and Senior Corporate Counsel at Fate Therapeutics. Ms. Tahl manages the company's intellectual property and is responsible for building and maintaining a robust patent portfolio. Prior to joining Fate Therapeutics, Ms. Tahl was an associate in the San Diego office of Wilson Sonsini Goodrich & Rosati, P.C. As a member of the firm's technology transactions group, she worked extensively with early stage biotechnology companies to implement strategies for the protection, management and licensing of intellectual property assets, and represented clients in corporate transactions relating to the acquisition, transfer and use of intellectual property rights. Earlier in her career, Ms. Tahl was an associate in the New York office of Kenyon & Kenyon, LLP, where she managed the patent portfolios of biotechnology and pharmaceutical companies, including preparing and prosecuting U.S. and PCT patent applications and directing prosecution of foreign counterparts and executing prosecution strategy. She also advised clients on the scope, infringement, validity and enforceability of U.S. patents, assisting in risk assessment, enforcement of IP rights, and the defense of claims of infringement of third party IP rights. Ms. Tahl earned a J.D. from Boston College Law School and a B.S. in biology from the University of California, San Diego. She is admitted to the California and New York Bars, and is registered to practice as a patent attorney before the U.S. Patent and Trademark Office.

MOYA M. DANIELS, MS, CCRP
Vice President of Regulatory Affairs and Quality Assurance

Moya Daniels joined Fate in 2014 and is the Vice President of Regulatory Affairs and Quality Assurance at Fate and is leading the company's global regulatory and quality development. Ms. Daniels was previously Vice President of Regulatory Affairs for Macrocure, Ltd., a regenerative medicine company focused on the development of CureXcell for the treatment of chronic wounds. She led the global regulatory affairs strategy development in support of future licensure in the US and Europe. From 2000 to 2013, she held several positions with Osiris Therapeutics, Inc., including director of the Prochymal business unit, and later Senior Director of Regulatory Affairs and Quality Assurance, where her main focus was clinical and regulatory development of the adult mesenchymal stem cell for the treatment of graft versus host disease and various other indications. Ms. Daniels led the team responsible for the Health Canada approval of Prochymal, the world's first approved allogeneic stem cell product, for the treatment of pediatric steroid refractory acute graft versus host disease. Ms. Daniels received her M.S. in healthcare administration from the University of Maryland and her B.S. in biology from Saint Augustine's University.

Fate Therapeutics (FATE) – Historical Income Statement and Financial Projections

Figures in $ thousands except per share data	*2013A*	*1Q14A*	*2Q14A*	*3Q14E*	*4Q14E*	*2014E*	*1Q15E*	*2Q15E*	*3Q15E*	*4Q15E*	*2015E*	*2016E*	*2017E*	*2018E*	*2019E*	*2020E*	*2021E*	*2022E*
Revenues																		
ProHema-HSCT sales															56,000	101,500	163,100	235,200
Collaboration revenue	626																	
Grant revenue	345																	
Total Revenue	971														56,000	101,500	163,100	235,200
Operating expenses:																		
Cost of goods sold (COGS)															11,200	20,300	32,620	47,040
Research & development	12,007	4,522	3,968	4,365	4,408	17,263	4,849	4,898	5,632	6,759	22,138	30,188	34,667	42,138	52,480	58,595	60,975	63,450
General & administrative	6,639	2,415	2,072	2,093	2,114	8,693	2,156	2,199	2,243	2,288	8,886	9,618	10,411	11,639	16,215	19,710	27,025	39,567
Total operating expenses	18,646	6,937	6,040	6,458	6,522	25,957	7,005	7,097	7,875	9,047	31,024	39,807	45,078	53,777	79,895	98,605	120,619	150,057
Loss from operations	(17,675)	(6,937)	(6,040)	(6,458)	(6,522)	(25,957)	(7,005)	(7,097)	(7,875)	(9,047)	(31,024)	(39,807)	(45,078)	(53,777)	(23,895)	2,895	42,481	85,143
Other income (expense)																		
Interest income	6	1	1	1	1	4	1	1	1	1	4	4	5	5	5	5	5	6
Interest expense	(796)	(43)	(28)	(28)	(29)	(128)	(29)	(29)	(29)	(30)	(117)	(122)	(127)	(132)	(137)	(143)	(149)	(155)
Income from 48D tax credit																		
Loss on extinguishment of debt																		
Change in fair value of warrant liability	(8)																	
Change in fair value of exchangeable shares	(2,421)																	
Total other income (expense)	(3,219)	(42)	(27)	(27)	(28)	(124)	(28)	(28)	(28)	(29)	(113)	(118)	(122)	(127)	(132)	(138)	(143)	(149)
Net profit or loss	(20,894)	(6,979)	(6,067)	(6,485)	(6,550)	(26,080)	(7,033)	(7,125)	(7,904)	(9,075)	(31,137)	(39,924)	(45,200)	(53,904)	(24,028)	2,757	42,337	84,993
Income tax expense																		
Provision for income tax																		
Net profit or loss attribuable to common stock	(20,894)	(6,979)	(6,067)	(6,485)	(6,550)	(26,080)	(7,033)	(7,125)	(7,904)	(9,075)	(31,137)	(39,924)	(45,200)	(53,904)	(24,028)	2,757	42,337	84,993
Earnings per share:																		
Basic	(3.54)	(0.34)	(0.30)	(0.32)	(0.32)	(1.27)	(0.34)	(0.34)	(0.29)	(0.33)	(1.30)	(1.45)	(1.19)	(1.40)	(0.62)	0.07	1.07	2.13
Diluted	(3.54)	(0.34)	(0.30)	(0.32)	(0.32)	(1.27)	(0.34)	(0.34)	(0.29)	(0.33)	(1.30)	(1.45)	(1.19)	(1.40)	(0.62)	0.06	0.90	1.80
Average shares outstanding																		
Basic	5,896	20,347	20,468	20,568	20,668	20,513	20,768	20,868	27,218	27,318	24,043	27,568	37,968	38,368	38,768	39,168	39,568	39,968
Diluted	5,896	20,347	20,468	20,568	20,668	20,513	20,768	20,868	27,218	27,318	24,043	27,568	37,968	38,368	38,768	46,480	46,880	47,280

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212-356-0542

Source: Company Reports and H.C. Wainwright Research

Fate Therapeutics (FATE) – Balance Sheet

Figures in $ thousands except per share data	3Q13	FY2013	1Q14	2Q14
ASSETS				
Cash and cash equivalents	19,082	54,036	47,881	42,012
Prepaid expenses and other current assets	304	615	382	233
TOTAL current assets	19,386	54,651	48,263	42,245
Property and equipment, net	789	810	1,264	1,159
Restricted cash	122	122	122	122
Other assets	2,743			25
TOTAL non-current assets	3,654	932	1,386	1,306
TOTAL assets	23,040	55,583	49,649	43,551
LIABILITIES				
Accounts payable	3,725	682	1,330	980
Accrued expenses		2,039	1,641	1,948
Current portion of deferred revenue				
Current portion of deferred rent	45	53	61	69
Convertible notes, net of discount	3,481			
Repurchase liability for unvested equity awards	106	94	82	69
Preferred stock warrant liability	163			
Long-term debt, current portion	1,971	1,732	1,240	746
TOTAL current liabilities	9,491	4,600	4,354	3,812
Deferred rent	153	135	118	101
Accrued expenses	137			
Exchangeable share liability	2,885			
Long-term debt, less current portion	250			
Long-term convertible notes	20,000			
Commitments and contingencies				
TOTAL non-current liabilities	23,425	135	118	101
TOTAL liabilities	32,916	4,735	4,472	3,913
STOCKHOLDER'S EQUITY				
Preferred stock, $0.001 par value; authorized shares-5,000,000 at March 31, 2014 and December 31, 2013; no shares issued or outstanding	56,526			
Common stock, $0.001 par value; authorized shares - 150,000,000 at March 31, 2014 and December 31, 2013; issued and outstanding shares - 20,463,849 at March 31, 2014 and 20,434,080 at December 31, 2013	1	20	20	21
Additional paid-in capital	14,367	137,337	138,646	139,173
Deficit accumulated during the development stage	(80,770)	(86,509)	(93,489)	(99,556)
TOTAL stockholders' equity (deficit)	(66,402)	50,848	45,177	39,638
TOTAL liabilities and stockholders' equity	23,040	55,583	49,649	43,551

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Important Disclaimers

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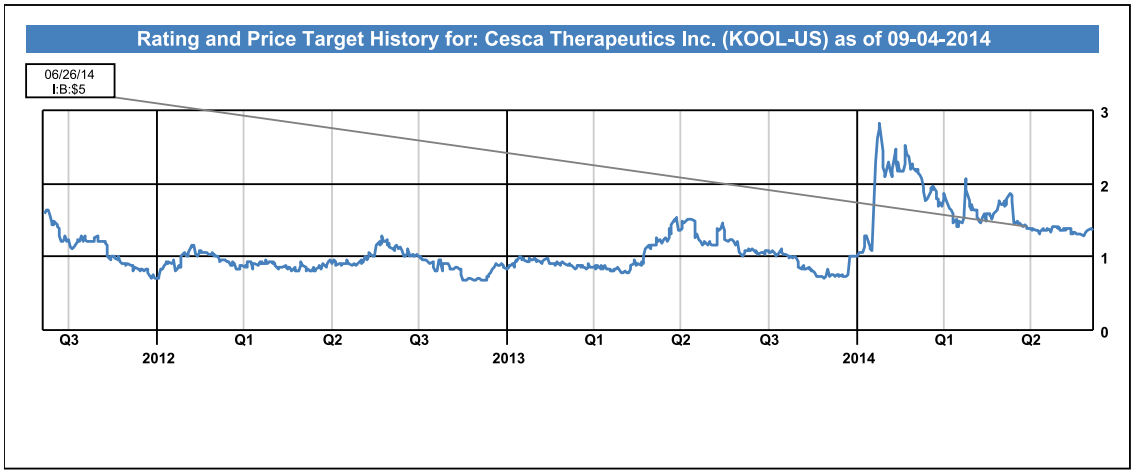
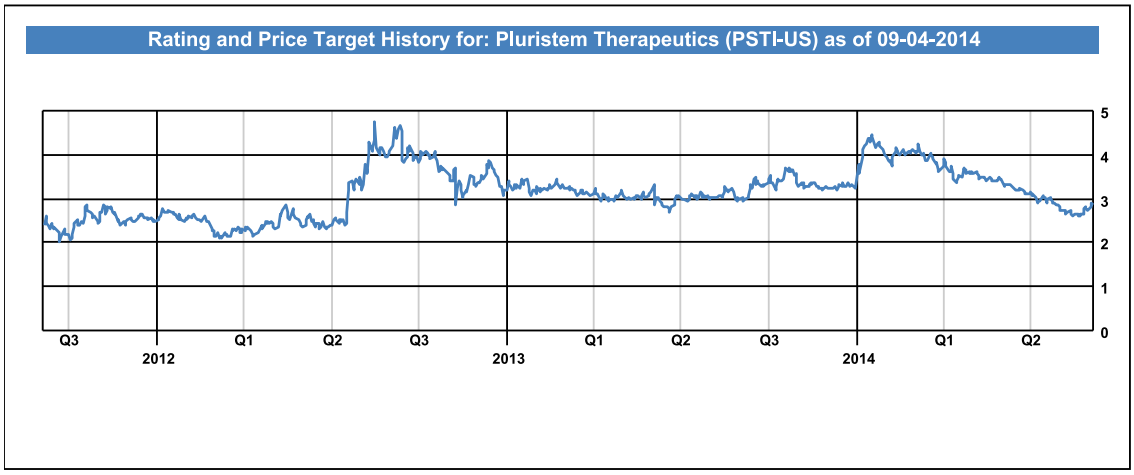
RETURN ASSESSMENT

Market Outperform (Buy): The common stock of the company is expected to outperform a passive index comprised of all the common stock of companies within the same sector.

Market Perform (Neutral): The common stock of the company is expected to mimic the performance of a passive index comprised of all the common stock of companies within the same sector.

Market Underperform (Sell): The common stock of the company is expected to underperform a passive index comprised of all the common stock of companies within the same sector.





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Distribution of Ratings Table				
			IB Service/Past 12 Months	
Ratings	Count	Percent	Count	Percent
Buy	77	91.67%	34	44.16%
Neutral	6	7.14%	0	0.00%
Sell	0	0.00%	0	0.00%
Under Review	1	1.19%	0	0.00%
Total	84	100%	34	40.48%

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