

FATE THERAPEUTICS INC
Form 424B5
May 18, 2015

Use these links to rapidly review the document

[TABLE OF CONTENTS](#)

[TABLE OF CONTENTS](#)

[Table of Contents](#)

**FILED PURSUANT TO RULE 424(b)(5)
REG. STATEMENT NO. 333-199107**

The information in this preliminary prospectus supplement is not complete and may be changed. A registration statement relating to these securities has become effective by rule of the Securities and Exchange Commission. This preliminary prospectus supplement and the accompanying prospectus are not an offer to sell these securities, and we are not soliciting offers to buy these securities, in any state or other jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED MAY 18, 2015

PROSPECTUS SUPPLEMENT
(To Prospectus dated October 15, 2014)

6,000,000 Shares

Common Stock

We are offering 6,000,000 shares of our common stock. Our common stock is listed on The NASDAQ Global Market under the symbol "FATE". On May 15, 2015, the last reported sale price for our common stock on The NASDAQ Global Market was \$6.80 per share.

We are an "emerging growth company" under applicable Securities and Exchange Commission rules and are subject to reduced public company reporting requirements.

Investing in our common stock involves a high degree of risk. Please read "Risk Factors" on page S-11 of this prospectus supplement and the documents incorporated by reference into this prospectus supplement.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved these securities or determined if this prospectus supplement or the accompanying prospectus is accurate or complete. Any representation to the contrary is a criminal offense.

Per Share

Total

Edgar Filing: FATE THERAPEUTICS INC - Form 424B5

Public offering price	\$	\$
Underwriting discounts and commissions(1)	\$	\$
Proceeds, before expenses, to us	\$	\$

(1) We have agreed to reimburse the underwriters for certain expenses. See "Underwriting."

We have granted the underwriters an option for 30 days from the date of this prospectus supplement to purchase up to 900,000 additional shares of our common stock. See "Underwriting" for more information.

The underwriters expect to deliver the shares to the investors on or about May , 2015.

Joint Book-Running Managers

Leerink Partners

BMO Capital Markets

Co-Managers

Wedbush PacGrow

H.C. Wainwright & Co.

May , 2015

Table of Contents

TABLE OF CONTENTS

	Page
Prospectus Supplement	
<u>About this Prospectus Supplement</u>	<u>S-1</u>
<u>Prospectus Supplement Summary</u>	<u>S-2</u>
<u>Risk Factors</u>	<u>S-11</u>
<u>Forward-Looking Statements</u>	<u>S-13</u>
<u>Use of Proceeds</u>	<u>S-14</u>
<u>Price Range of Common Stock</u>	<u>S-15</u>
<u>Dividend Policy</u>	<u>S-16</u>
<u>Capitalization</u>	<u>S-17</u>
<u>Dilution</u>	<u>S-19</u>
<u>Material United States Federal Income Tax Considerations for Non-U.S. Holders</u>	<u>S-21</u>
<u>Underwriting</u>	<u>S-25</u>
<u>Legal Matters</u>	<u>S-30</u>
<u>Experts</u>	<u>S-30</u>
<u>Where You Can Find More Information</u>	<u>S-30</u>
<u>Incorporation of Certain Information by Reference</u>	<u>S-30</u>
Prospectus	
	Page
<u>About this Prospectus</u>	<u>1</u>
<u>Risk Factors</u>	<u>1</u>
<u>Cautionary Statement Regarding Forward-Looking Statements</u>	<u>2</u>
<u>The Company</u>	<u>3</u>
<u>Ratio of Earnings to Fixed Charges</u>	<u>4</u>
<u>Use of Proceeds</u>	<u>4</u>
<u>Securities We May Offer</u>	<u>4</u>
<u>Description of Capital Stock</u>	<u>5</u>
<u>Description of Debt Securities</u>	<u>9</u>
<u>Description of Warrants</u>	<u>25</u>
<u>Description of Units</u>	<u>26</u>
<u>Plan of Distribution</u>	<u>29</u>
<u>Legal Matters</u>	<u>32</u>
<u>Experts</u>	<u>32</u>
<u>Where You Can Find More Information</u>	<u>32</u>
<u>Incorporation by Reference</u>	<u>32</u>

We have not, and the underwriters have not, authorized anyone to provide you with information different than that which is contained in or incorporated by reference in this prospectus supplement, the accompanying prospectus and in any free writing prospectus that we have authorized for use in connection with this offering. We are not, and the underwriters are not, making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus supplement, the accompanying prospectus, the documents incorporated by reference in this prospectus supplement and the accompanying prospectus, and in any free writing prospectus that we have authorized for use in connection with this offering, is accurate only as of the date of those respective documents. Our business, financial condition, results of operations and prospects may have changed since those dates. You should read this prospectus supplement, the accompanying prospectus, the documents incorporated by reference in this prospectus

Table of Contents

supplement and the accompanying prospectus, and any free writing prospectus that we have authorized for use in connection with this offering, in their entirety before making an investment decision. You should also read and consider the information in the documents to which we have referred you in the sections of this prospectus supplement entitled "Where You Can Find More Information" and "Incorporation of Certain Information by Reference."

For investors outside the United States: We have not and the underwriters have not done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of common stock and the distribution of this prospectus outside the United States.

Table of Contents

ABOUT THIS PROSPECTUS SUPPLEMENT

This document is in two parts. The first part is this prospectus supplement, which describes the terms of this offering of common stock and also adds to and updates information contained in the accompanying prospectus and the documents incorporated by reference into this prospectus supplement and the accompanying prospectus. The second part, the accompanying prospectus dated October 15, 2014, including the documents incorporated by reference therein, provides more general information. Generally, when we refer to this prospectus, we are referring to both parts of this document combined. To the extent there is a conflict between the information contained in this prospectus supplement, on the one hand, and the information contained in the accompanying prospectus or in any document incorporated by reference that was filed with the Securities and Exchange Commission, or SEC, before the date of this prospectus supplement, on the other hand, you should rely on the information in this prospectus supplement. If any statement in one of these documents is inconsistent with a statement in another document having a later date for example, a document incorporated by reference in the accompanying prospectus the statement in the document having the later date modifies or supersedes the earlier statement. You should assume that the information contained in this prospectus supplement is accurate as of the date on the front cover of this prospectus supplement only and that any information we have incorporated by reference or included in the accompanying prospectus is accurate only as of the date given in the document incorporated by reference or as of the date of the prospectus, as applicable, regardless of the time of delivery of this prospectus supplement or the accompanying prospectus or any sale of our common stock. Our business, financial condition, results of operations and prospects may have changed since that date.

Unless the context indicates otherwise, as used in this prospectus supplement, the terms "Fate," "Fate Therapeutics," "Company," "we," "us" and "our" refer to Fate Therapeutics, Inc. and its subsidiaries.

This prospectus supplement, the accompanying prospectus and the information incorporated herein and therein by reference may include trademarks, service marks and trade names owned by us or other companies. We own various U.S. federal trademark registrations and applications, and unregistered trademarks, including the following marks referred to in this prospectus supplement: Fate Therapeutics®, our corporate logo and ProHema®. All trademarks, service marks and trade names included or incorporated by reference into this prospectus supplement or the accompanying prospectus are the property of their respective owners. Solely for convenience, the trademarks and trade names in this prospectus supplement, the accompanying prospectus and the information incorporated herein and therein are referred to without the symbols ® and ™, but such references should not be construed as any indicator that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto.

Table of Contents

PROSPECTUS SUPPLEMENT SUMMARY

This summary highlights selected information contained elsewhere or incorporated by reference in this prospectus supplement and the accompanying prospectus. This summary does not contain all the information you should consider before investing in our common stock. You should read and consider carefully the more detailed information in this prospectus supplement and the accompanying prospectus, including the factors described under the heading "Risk Factors" in this prospectus supplement and the financial statements, notes to financial statements, financial and other information incorporated by reference in this prospectus supplement and the accompanying prospectus, as well as the information included in any free writing prospectus that we have authorized for use in connection with this offering, before making an investment decision.

Our Company

We are a clinical-stage biopharmaceutical company engaged in the development of programmed cellular therapeutics for the treatment of severe, life-threatening diseases. We have built a novel platform to program the function and fate of cells *ex vivo* using pharmacologic modulators, such as small molecules. We are focused primarily on developing programmed hematopoietic cellular candidates as therapeutic entities for the treatment of hematologic malignancies, rare genetic disorders, and diseases resulting from the dysregulation of the immune system. We were incorporated in Delaware in 2007, and are headquartered in San Diego, CA.

Recent Developments

Phase 2 PUMA Study of ProHema

On May 6, 2015, we reported additional data from our ongoing Phase 2 clinical trial of our ProHema product candidate, an *ex vivo* programmed hematopoietic cellular therapeutic candidate derived from umbilical cord blood, which we refer to as the PUMA (ProHema in Umbilical cord blood transplant in Adults) study. The PUMA study is a randomized, controlled, open-label Phase 2 multi-center clinical trial of ProHema in adult subjects undergoing double umbilical cord blood transplantation, or dUCBT, for the treatment of hematologic malignancies.

The clinical update included data from 18 subjects in the ProHema cohort and 12 subjects in a concurrent control cohort. The majority of subjects in both cohorts had acute leukemia (acute myeloid leukemia, acute lymphocytic leukemia or biphenotypic leukemia). Fifteen of the 18 subjects administered ProHema and 10 of the 12 subjects in the concurrent control cohort received myeloablative conditioning, or MAC, prior to transplant; the remaining subjects in each cohort received reduced-intensity conditioning, or RIC. Based on an analysis of the currently available data:

Subjects administered ProHema had both an increased incidence of early neutrophil engraftment and a reduction in median time of neutrophil engraftment, as compared to a historical control group as well as to subjects in the concurrent control cohort. Specifically, 14 subjects administered ProHema achieved neutrophil engraftment, nine of which engrafted prior to both the applicable median of the historical control group and of the concurrent control cohort (64%). Additionally, engrafting subjects administered ProHema had a six-day reduction and a five-day reduction in median time of neutrophil engraftment as compared to the historical control group medians and the concurrent control cohort medians, respectively. Neutrophil engraftment is an early and essential clinical milestone for patients undergoing hematopoietic stem cell transplantation, or HSCT, and delay in or failure of engraftment leaves a patient severely immunocompromised and exposed to high risk of early morbidity and mortality.

Cytomegalovirus, or CMV, sero-positive subjects administered ProHema had both a reduced incidence of CMV reactivation and a reduction in the proportion of tests that were positive for

Table of Contents

CMV during the first 100 days post-transplant, as compared to CMV sero-positive subjects in the concurrent control cohort. Specifically, CMV reactivation was observed in seven of the 11 subjects administered ProHema (64%) who tested sero-positive for CMV at baseline, as compared to 11 of 11 subjects in the concurrent control cohort (100%) who tested sero-positive for CMV at baseline. Additionally, among CMV sero-positive subjects who had reached at least 100 days post-transplant, 14% of tests were positive for CMV reactivation in subjects administered ProHema (n=8), as compared to 23% of tests that were positive for CMV reactivation in subjects in the concurrent control cohort (n=9). CMV infection and CMV disease are significant complications following HSCT, and prevention of CMV reactivation may reduce the medical and economic burden of HSCT by avoiding the toxicity and high cost of pre-emptive treatment with anti-viral agents.

Subjects administered ProHema had both a reduced incidence, and a reduction in the number, of infection-related adverse events, as compared to subjects in the concurrent control cohort. Specifically, 10 of 18 subjects administered ProHema (56%) experienced at least one infection-related adverse event, and these 10 subjects experienced a total of 13 infection-related adverse events (1.3 per subject). By comparison, eight of 12 subjects in the concurrent control cohort (67%) experienced at least one infection-related adverse event, and these eight subjects experienced a total of 19 infection-related adverse events (2.4 per subject). Among all 18 subjects administered ProHema, no adverse events of CMV infection (0%) and six adverse events of bacterial infection (33%) have been reported. Among all 12 subjects in the concurrent control cohort, four adverse events of CMV infection (33%) and seven adverse events of bacterial infection (58%) have been reported.

We expect to report data on the primary efficacy endpoint from the PUMA study in the second half of 2015.

Strategic Research Collaboration and License Agreement with Juno Therapeutics, Inc.

On May 4, 2015, we entered into an exclusive research collaboration and license agreement, or the Collaboration Agreement, with Juno Therapeutics, Inc., or Juno, a biopharmaceutical company focused on re-engaging the body's immune system to revolutionize the treatment of cancer, to identify and apply small molecule modulators for programming genetically-engineered chimeric antigen receptor, or CAR, T cell and T cell receptor, or TCR, immunotherapies. Pursuant to the terms of the Collaboration Agreement, Juno paid us an upfront payment of \$5.0 million. Additionally, on May 4, 2015, we entered into a stock purchase agreement with Juno, or the Stock Purchase Agreement, pursuant to which we sold 1,000,000 shares of our common stock to Juno, at \$8.00 per share, for an aggregate purchase price of \$8.0 million on May 7, 2015.

Under the Collaboration Agreement, we are responsible for screening and identifying small molecule modulators of immunological cells, while Juno is responsible for the development and commercialization of genetically-engineered T cell immunotherapies incorporating our modulators. Juno has agreed to fund all of our activities related to the collaboration for an initial four-year research term beginning on the effective date of the Collaboration Agreement. Juno has the option to extend the research term for an additional two years, subject to the payment of an extension fee and the continued funding of all activities related to the collaboration during the extended term. If Juno exercises its option to extend the research term, we have the option to sell, and to cause Juno to purchase, up to \$10.0 million in additional shares of our common stock, at 120% of the volume-weighted average trading price for the 30 trading days prior to Juno's exercise, pursuant to the terms and conditions of the Stock Purchase Agreement.

For each product developed by Juno that incorporates modulators identified through the research program under the Collaboration Agreement, we are eligible to receive target selection fees and

Table of Contents

clinical, regulatory and commercial milestones up to an aggregate of approximately \$50.0 million. In addition, we are eligible to receive low single-digit royalties on net sales of modulated products under the Collaboration Agreement.

Pursuant to the Collaboration Agreement, we have granted Juno an exclusive worldwide license to certain of our intellectual property, including our intellectual property arising under the Collaboration Agreement, to make, use, sell and otherwise exploit genetically-engineered CAR T cell and TCR immunotherapies, using or incorporating small molecule modulators, directed against certain tumor-associated antigen targets designated by Juno, subject to the selection of a target by Juno. We have retained exclusive rights to our intellectual property, including our intellectual property arising under the agreement, for all purposes outside of tumor-associated antigen targets selected by Juno under the collaboration.

Our Cell Programming Approach

The use of human cells as therapeutic entities has disease-transforming potential. One of the most successful and widespread applications of cellular therapeutics is within the setting of HSCT, with over 60,000 procedures performed worldwide on an annual basis. HSCT holds curative potential for patients afflicted with hematologic malignancies, such as leukemia and lymphoma, and with rare genetic disorders, such as inherited metabolic disorders, or IMDs, and immune deficiencies. Building upon this well-established medical precedent, the clinical investigation of isolated hematopoietic cells, such as CD34+ cells and T cells, as therapeutic entities for the treatment of human diseases is rapidly expanding. In fact, in the United States alone, over 1,200 clinical trials of hematopoietic cellular therapeutics are currently being conducted, including a growing number of trials with genetically-engineered hematopoietic cells.

We believe the function of hematopoietic cells can be pharmacologically optimized to maximize therapeutic benefit. Since our founding, we have been dedicated to programming the function of cells *ex vivo* to improve their therapeutic potential. We have built a platform that enables us to systematically and precisely modulate *ex vivo* the biological properties of hematopoietic cells. Using advanced molecular characterization tools and technologies, we identify small molecule or biologic modulators that promote rapid and supra-physiologic activation or inhibition of therapeutically-relevant genes and cell-surface proteins, such as those involved in the homing, proliferation and survival of CD34+ cells or those involved in the persistence, proliferation and reactivity of T cells. We believe that *ex vivo* cell programming can positively affect the biological activity and therapeutic potential of cells *in vivo*, and that severe, life-threatening diseases can be addressed through the development of programmed hematopoietic cellular therapeutics.

Additionally, we have pioneered the derivation and differentiation of human induced pluripotent stem cells, or hiPSCs, a potentially disruptive technology to program the fate of cells *ex vivo*. hiPSCs are human pluripotent cells that have been reprogrammed through the expression of certain genes and factors, such that the cell's cellular and physiological traits are similar to those of an embryonic stem cell. We use our technology to isolate, genetically engineer, select and characterize hiPSCs, at a single-cell level, for clonal expansion. We believe our hiPSC platform has the potential to create large quantities of homogeneous cell populations in the hematopoietic lineage, such as CD34+ cells, T cells and natural killer, or NK, cells, which can otherwise be limited in quantity, difficult to manufacture, heterogeneous in composition and unoptimized for efficacy. Based on this potential, we believe our hiPSC platform may enable the development of a novel class of transformative cellular therapeutics.

Table of Contents**Summary of Our Product Pipeline**

The following table summarizes our programmed cellular therapeutic candidates currently in development and those currently in research:

Program	Target Disease	Stage	2015 Milestone
<i>Proprietary Development Programs</i>			
ProHema Programmed Cord Blood (PUMA)	Hematologic Malignancies (adult)	Phase 2	Clinical Data
ProHema Programmed Cord Blood (PROMPT)	Hematologic Malignancies (pediatric)	Phase 1b	Clinical Data
ProHema Programmed Cord Blood (PROVIDE)	Inherited Metabolic Disorders (pediatric)	Phase 1b	Clinical Data
ProTmune Programmed mPB	Hematologic Malignancies (adult)	IND preparation	IND submission
<i>Proprietary Research Programs</i>			
PD-L1 Programmed CD34+ Cells	Immune Disorders		
Programmed Hematopoietic Cells	Undisclosed		
hiPSC-derived Hematopoietic Cells	Undisclosed		
hiPSC-derived Myogenic Cells	Muscle Regeneration		
<i>Platform Collaboration Programs</i>			
Programmed CAR-T / TCR Juno Therapeutics	Undisclosed tumor- associated antigen targets		

"mPB" refers to hematopoietic cells within mobilized peripheral blood.

"hiPSC" refers to human induced pluripotent stem cells.

"CAR-T" refers to genetically-engineered chimeric antigen receptor T cell immunotherapies.

"TCR" refers to genetically-engineered T cell receptor immunotherapies.

ProHema

Our lead product candidate, ProHema, is an *ex vivo* programmed hematopoietic cellular therapeutic candidate derived from umbilical cord blood. ProHema is produced by programming the biological properties of CD34+ cells and T cells of umbilical cord blood *ex vivo* using the small molecule modulator FT1050 (16,16 dimethyl prostaglandin E2, or dmpGE2). Our proprietary modulation process induces rapid activation of genes involved in the homing, proliferation and survival of hematopoietic stem cells, or HSCs, and in the cell cycle, reactivity and anti-viral properties of T cells. We are developing ProHema to enable the curative potential of HSCT in patients across a wide range of ages and a broad spectrum of life-threatening malignant diseases and rare genetic disorders. The United States Food and Drug Administration, or FDA, has granted orphan designation for ProHema for the enhancement of stem cell engraftment to treat neutropenia, thrombocytopenia, lymphopenia and anemia, and the European Commission has granted orphan designation for ProHema for the treatment of acute myeloid leukemia.

Table of Contents

Phase 2 PUMA Study Adult Subjects with Hematologic Malignancies. The PUMA study is a randomized, controlled, open-label Phase 2 multi-center clinical trial of ProHema in adult subjects undergoing double umbilical cord blood transplantation, or dUCBT, for the treatment of hematologic malignancies including acute lymphoblastic leukemia, acute myelogenous leukemia and non-Hodgkin lymphoma. The PUMA study is designed to enroll 60 subjects, age 15 to 65 years, and is currently being conducted at 10 leading allogeneic HSCT centers in the United States. Eligible subjects are being randomized, at a ratio of 2:1, with approximately 40 subjects expected to receive ProHema plus an unmanipulated cord blood unit, and approximately 20 subjects in a concurrent control cohort expected to receive a standard dUCBT. Based upon physician choice, subjects are being treated with one of two conditioning regimens, an intense myeloablative regimen, or MAC, or a reduced-intensity regimen, or RIC, to destroy malignant cells and to prevent rejection of the donor hematopoietic cells.

Multiple clinical outcomes that contribute significantly to the overall morbidity and mortality of allogeneic HSCT are being evaluated in the PUMA study. These various parameters of safety and efficacy include key measures of the hematopoietic reconstitution and immunotherapeutic potential of ProHema, such as time to and incidence of neutrophil and platelet engraftment, viral reactivation, bacterial and viral infections, graft versus host disease, or GvHD, rates of engraftment failure, relapse of underlying disease, and overall and disease-free survival. The primary endpoint of the PUMA study is based on a categorical analysis of neutrophil engraftment, and the clinical trial is powered to show with statistical significance that 70% of subjects with neutrophil engraftment in the ProHema cohort engraft prior to a pre-specified historical control day of neutrophil engraftment, which has been established as 26 days for subjects receiving MAC and 21 days for subjects receiving RIC. We plan to utilize the data from the concurrent control cohort in the PUMA study to provide context for validating these pre-specified historical control values of engraftment and for interpreting other clinical outcomes. We expect data on the primary efficacy endpoint from the Phase 2 PUMA study to be available in the second half of 2015.

An independent Data Monitoring Committee, or iDMC, is providing safety oversight during the conduct of the PUMA study. In December 2014, the PUMA study's iDMC conducted a pre-planned interim safety review on a total of 12 subjects who were administered ProHema. At the time of the review, two early deaths prior to engraftment, which were both attributed to the toxicity of the conditioning regimen received by the subjects, were reported in the ProHema cohort; and one subject administered ProHema failed to achieve neutrophil engraftment. Based on its consideration of the data available as well as historical outcomes reported from multi-center clinical experiences, the iDMC determined that ProHema had met pre-established safety criteria and supported continuation of the PUMA study. Since the time of the iDMC's review in December 2014, one subject administered ProHema failed to achieve neutrophil engraftment. We believe that the nature and frequency of these adverse events are consistent with the complications typically seen in adult patients undergoing umbilical cord blood transplantation for the treatment of hematologic malignancies.

Phase 1b PROMPT Study Pediatric Subjects with Hematologic Malignancies. Each year, over 3,500 children in the United States are diagnosed with leukemia, many of whom may ultimately require HSCT using single umbilical cord blood transplantations, or sUCBTs, the standard of care in umbilical cord blood transplantation for the treatment of hematologic malignancies in pediatric patients. Data suggest that pediatric patients undergoing sUCBT are at high risk for experiencing delayed engraftment, graft failure and transplant-related morbidity and mortality. We are currently conducting an open-label Phase 1b multi-center clinical trial of ProHema in pediatric subjects undergoing sUCBT following myeloablative conditioning for the treatment of various hematologic malignancies, such as acute lymphoblastic leukemia and acute myeloid leukemia, a clinical trial which we refer to as the PROMPT (*PROHema for the treatment of hematologic Malignancies in PediaTric patients*) study. The PROMPT study is designed to enroll up to 18 subjects, between the ages of 1 and 18, at three leading pediatric HSCT centers in the United States. The primary endpoint of the PROMPT study is safety as

Table of Contents

assessed by neutrophil engraftment. The study will also evaluate various parameters of safety and efficacy, including various measures of neutrophil engraftment, platelet engraftment, bacterial and viral infections, GvHD, rates of engraftment failure, and overall and disease-free survival. We expect data on the primary endpoint from the Phase 1b PROMPT study to be available in the second half of 2015.

Phase 1b PROVIDE Study Pediatric Subjects with Inherited Metabolic Disorders. The transformative effect of allogeneic HSCT, and umbilical cord blood transplantation in particular, across a broad spectrum of rare genetic disorders has been demonstrated and published in numerous clinical studies, case series and retrospective analyses of multi-national patient registries. It is estimated that over 50 rare genetic disorders, many of which are life-threatening and lack alternative therapeutic options, have been treated with allogeneic HSCT to date. Since allogeneic hematopoietic cells are sourced from healthy donors, we believe our product candidates have the inherent potential to correct genetic defects across a wide range of rare genetic disorders, whether they are caused by defective genes encoding enzymes, hemoglobin or other essential proteins.

During the first half of 2015, we plan to initiate an open-label Phase 1b multi-center clinical trial of ProHema in pediatric subjects undergoing sUCBT for the treatment of IMDs, a clinical trial which we refer to as the PROVIDE (PROHema eValuation for the treatment of Inherited metabolic Disorders) study. The PROVIDE study is designed to enroll up to 12 subjects with various forms of IMDs, between the ages of 1 and 18, at up to three leading pediatric HSCT centers in the United States. IMDs, such as Hurler and Hunter syndromes, Krabbe disease and various other leukodystrophies, include a range of genetic enzyme deficiencies that interfere with critical metabolic pathways necessary to maintain normal organ function. In many of these disorders, the enzyme deficiency leads to cellular accumulation of toxic intermediates within the brain, causing progressive neurological damage that cannot be addressed with traditional enzyme replacement therapy. The study inclusion criteria allow for the enrollment of pediatric subjects with sixteen different types of IMDs.

While the primary endpoint of the PROVIDE study is safety as assessed by neutrophil engraftment, we plan to follow subjects for a two-year period following HSCT and regularly conduct a series of neuro-imaging and neuro-cognitive assessments to explore the potential of the programmed hematopoietic cells to provide long-term replacement of the otherwise deficient enzyme to the central nervous system. We believe the programming of CD34+ cells has the potential to significantly improve the homing of donor-derived cells across the blood-brain barrier, arresting degenerative neurological manifestations and improving the course of disease progression in pediatric patients with rare genetic disorders, such as IMDs. Subject to commencing enrollment in accordance with our plans, we expect to report initial topline data from our PROVIDE study in 2015.

ProTmune

Mobilized peripheral blood is the predominant cell source used in HSCT. While the use of mobilized peripheral blood is associated with faster rates of neutrophil and platelet engraftment compared to other cell sources, approximately 35-50% of patients develop severe viral infections, such as CMV infection, within the first 100 days following HSCT and approximately 50% of patients develop acute GvHD within the first 180 days following HSCT. We believe our cell programming approach has the potential to mitigate these T cell-mediated complications and improve outcomes in patients undergoing HSCT with mobilized peripheral blood as a cell source.

We are currently preparing for an Investigational New Drug, or IND, application for ProTmune, an *ex vivo* programmed hematopoietic cellular therapeutic derived from mobilized peripheral blood. ProTmune is produced by programming the biological properties of CD34+ cells and T cells of mobilized peripheral blood *ex vivo* using the small molecule modulators FT1050 and FT4145. At the 56th Annual Meeting and Exposition of the American Society of Hematology in December 2014, we presented data showing that FT4145 synergizes with FT1050 to promote the supra-physiologic

Table of Contents

activation of genes implicated in the cell cycle, immune tolerance and anti-viral properties of T cells, as well as in the survival, proliferation and engraftment potential of CD34+ cells. We plan to submit our IND application for ProTmune to the FDA in 2015 to support the initiation of a clinical trial in adult subjects undergoing allogeneic HSCT for the treatment of hematologic malignancies.

Research Programs

We seek to leverage our scientific, clinical and regulatory expertise to build a pipeline of programmed CD34+ cells and programmed T cells as therapeutic entities for use beyond the HSCT setting. We have built a leadership position in the identification of pharmacologic modulators, including combinations of modulators, that promote rapid and supra-physiologic activation or inhibition of therapeutically-relevant genes and cell-surface proteins on CD34+ cells and T cells. Additionally, we have developed a proprietary, small molecule-enhanced hiPSC platform. We believe our hiPSC platform can enable the development of entirely new classes of autologous, allogeneic, and genome-edited cellular therapeutics with disease-transforming potential.

Programmed Hematopoietic Cells. We are currently investigating several opportunities for programmed hematopoietic cellular candidates with disease-transforming potential, including programmed CD34+ cells and programmed T cells for the regulation of the immune system. Using our screening platform, we have identified a triple modulator combination of pharmacologic modulators that programs human CD34+ cells to express high levels of PD-L1, a key immunosuppressive protein. The role of the PD-1/PD-L1 pathway is being explored in the field of cancer immunotherapy, and recent clinical results demonstrating the potential for PD-1 checkpoint inhibitors to enhance the ability of T cells to eliminate cancer cells provides support for the potent immunosuppressive potential of PD-L1 expression. We are exploiting PD-L1 expression to limit the activity of activated T cells arising from an inflammatory or auto-immune response. Using a combination of three modulators, we have increased by greater than 100-fold the gene expression levels of PD-L1 on CD34+ cells during a transient *ex vivo* modulation. Additionally, CD34+ cells programmed with the three-modulator combination have been shown to significantly reduce the proliferation rates of activated T cells using *in vitro* assays, as compared to unmodulated HSCs. We are currently investigating the *in vivo* therapeutic potential of PD-L1 programmed CD34+ cells to selectively home to sites of, and suppress, T cell proliferation and cytokine production. We aim to nominate a programmed hematopoietic cellular candidate for further development in 2015.

hiPSC-derived Cellular Therapeutics. We believe hiPSC technology has the potential to enable the next frontier in the development of cellular therapeutics. The discovery that it is possible to reprogram the fate of fully-differentiated human cells *ex vivo* through the expression of certain genes and factors, such that the reprogrammed cell's cellular and physiological traits are similar to those of an embryonic stem cell, represents a significant scientific breakthrough in the past decade and was recognized with the 2012 Nobel Prize in Science and Medicine. The advent of hiPSCs, with their capacity to be cultured and expanded indefinitely *in vitro* and to serve as a potentially unlimited cell source for differentiation into specialized cell types, introduces a new and potentially disruptive strategy for modeling human disease and developing innovative cellular therapeutics.

We have developed a proprietary, small molecule-enhanced hiPSC platform. Our patent-protected hiPSC technology enables the isolation, genetic-engineering, selection and characterization of pluripotent cells, at the single-cell level, for clonal expansion. Additionally, we have demonstrated the potential to create large quantities of homogenous cell populations in the hematopoietic lineage, such as CD34+ cells, T cells and NK cells, which can otherwise be limited in quantity, difficult to manufacture, heterogeneous in composition and unoptimized for efficacy. We are currently applying our hiPSC platform to the research and development of hiPSC-derived cellular therapeutics for the treatment of hematologic, immunologic and skeletal muscle diseases and disorders.

Table of Contents

Platform Collaboration Programs

Over 1,200 clinical trials of hematopoietic cellular therapeutics are currently being conducted in the United States, which include novel approaches for the treatment of cancer, auto-immune diseases, degenerative diseases and genetic disorders. Most of these clinical trials use CD34+ cells or T cells, including genetically engineered cells, as therapeutic entities which have not been programmed *ex vivo* to optimize their biological activity and therapeutic potential *in vivo*. We believe there is an opportunity for convergence of genetic engineering and our *ex vivo* cell programming approach to maximize the therapeutic potential of cellular therapeutics. While significant advancements have been made to safely and efficiently engineer HSCs and T cells, and certain genetically-engineered therapeutic candidates have demonstrated encouraging initial clinical results in the setting of hematologic malignancies and genetic disorders, we believe the biological activity and therapeutic properties of hematopoietic cells can be optimized through cell programming. We therefore seek to partner with industry leaders for opportunities to potentiate the biological activity and maximize the therapeutic properties of cellular therapeutics prior to their administration to patients.

On May 4, 2015, we entered into the Collaboration Agreement with Juno to identify and apply small molecule modulators for programming genetically-engineered CAR T cell and TCR immunotherapies. See "Prospectus Supplement Summary Recent Developments Strategic Research Collaboration and License Agreement with Juno Therapeutics, Inc.," above, for further details. We expect to focus our efforts under the collaboration on identifying and applying small molecule modulators to immunological cells *ex vivo*, and on interrogating the effects of modulation on the biological activity and therapeutic potential of T cells *in vivo*. We believe the collaboration with Juno will provide us significant scientific leverage and afford us the opportunity to apply our small molecule modulators to our own pipeline of disease-transforming hematopoietic cellular candidates.

Corporate Information

We were incorporated in Delaware in 2007, and are headquartered in San Diego, CA. Our principal executive office is located at 3535 General Atomics Court, Suite 200, San Diego, CA 92121, and our telephone number is (858) 875-1800. Our website address is www.fatetherapeutics.com. We do not incorporate by reference into this prospectus supplement or the accompanying prospectus the information on or accessible through our website, and you should not consider any information on, or that can be accessed through, our website a part of this prospectus supplement or the accompanying prospectus.

On October 4, 2013, we completed our initial public offering. We qualify as an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, as amended, or the JOBS Act. As an emerging growth company, we may take advantage of specified reduced disclosure and other requirements that are otherwise applicable generally to public companies. We would cease to be an emerging growth company on the date that is the earliest of: (i) the last day of the fiscal year in which we have total annual gross revenues of \$1 billion or more; (ii) December 31, 2018; (iii) the date on which we have issued more than \$1 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer under the rules of the SEC.

Table of Contents

The Offering

Common stock offered by us	6,000,000 shares
Common stock to be outstanding immediately after this offering	26,637,217 shares
Option to purchase additional shares	We have granted the underwriters an option to purchase up to 900,000 additional shares of our common stock. This option is exercisable, in whole or in part, for a period of 30 days from the date of this prospectus supplement.
Use of proceeds	We estimate that the net proceeds from this offering, after deducting underwriting discounts and commissions and estimated offering expenses payable by us, will be approximately \$37.9 million, or approximately \$43.6 million if the underwriters exercise their option to purchase 900,000 additional shares from us in full, assuming a public offering price of \$6.80 per share, which was the last reported sale price of our common stock on The NASDAQ Global Market on May 15, 2015. We intend to use the net proceeds from this offering for clinical development and research activities, working capital and other general corporate purposes. See "Use of Proceeds."
Risk factors	Investing in our common stock involves a high degree of risk. See the description of risks set forth under "Risk Factors" in this prospectus supplement and otherwise incorporated by reference into this prospectus supplement and the accompanying prospectus for a description of factors to consider before deciding to purchase shares of our common stock.
NASDAQ Global Market Symbol	Our common stock is listed on The NASDAQ Global Market under the symbol "FATE".

The number of shares of our common stock to be outstanding immediately after this offering is based on 20,637,217 shares outstanding as of March 31, 2015, and excludes as of that date:

2,957,629 shares of common stock issuable upon the exercise of outstanding stock options under our equity incentive plans, with a weighted-average exercise price of \$4.03 per share;

134,113 shares of common stock issuable upon the exercise of warrants outstanding as of March 31, 2015, with a weighted-average exercise price of \$4.92 per share;

1,242,736 shares of common stock available for issuance under our 2013 Stock Option and Incentive Plan, or 2013 Plan, as well as any future increases in the number of shares of our common stock reserved for issuance under the 2013 Plan pursuant to evergreen provisions; and

729,000 shares of common stock available for issuance under our 2013 Employee Stock Purchase Plan, or ESPP, as well as any future increases in the number of shares of our common stock reserved for issuance under the ESPP pursuant to evergreen provisions.

The foregoing number of shares outstanding also does not give effect to our issuance and sale, on May 7, 2015, of 1,000,000 shares of our common stock to Juno in a private placement at \$8.00 per share.

Except as otherwise indicated, all information in this prospectus supplement assumes no exercise by the underwriters of their option to purchase additional shares and assumes no exercise of the outstanding stock options and warrants described above.

Table of Contents

RISK FACTORS

Investing in our common stock involves a high degree of risk. Our business, prospects, financial condition or operating results could be materially adversely affected by the risks identified below, as well as other risks not currently known to us or that we currently consider immaterial. The trading price of our common stock could decline due to any of these risks, and you may lose all or part of your investment. In assessing the risks described below, you should also refer to the information contained in our Annual Report on Form 10-K for the year ended December 31, 2014, our Quarterly Report on Form 10-Q for the quarter ended March 31, 2015, including the sections titled "Risk Factors," and in the other documents which are incorporated by reference in this prospectus supplement and the accompanying prospectus in their entirety.

Risks Related to this Offering

Management will have broad discretion as to the use of the net proceeds from this offering, and we may not use the proceeds effectively.

Our management will have broad discretion in the application of the net proceeds from this offering and could spend the proceeds in ways that do not improve our results of operations or enhance the value of our common stock. Our failure to apply these funds effectively could have a material adverse effect on our business, delay the development of our product candidates, and cause the price of our common stock to decline.

If you purchase the common stock sold in this offering, you will experience immediate and substantial dilution in your investment. You will experience further dilution if we issue additional equity securities in the future.

Since the price per share of our common stock being offered is substantially higher than the net tangible book value per share of our common stock, you will suffer substantial dilution with respect to the net tangible book value of the common stock you purchase in this offering. Based on an assumed public offering price of \$6.80 per share, which was the last reported sale price of our common stock on The NASDAQ Global Market on May 15, 2015, and our net tangible book value as of March 31, 2015, if you purchase shares of common stock in this offering, you will suffer immediate and substantial dilution of \$4.19 per share with respect to the net tangible book value of the common stock. See "Dilution" for a more detailed discussion of the dilution you will incur if you purchase common stock in this offering.

In addition, we have a significant number of stock options and warrants outstanding. To the extent that outstanding stock options or warrants have been or may be exercised or other shares issued, investors purchasing our common stock in this offering may experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders or result in downward pressure on the price of our common stock.

Sales of a substantial number of shares of our common stock by our existing stockholders in the public market could cause our stock price to fall.

If our existing stockholders sell, or indicate an intention to sell, substantial amounts of our common stock in the public market, the trading price of our common stock could decline. In addition a substantial number of shares of common stock are subject to outstanding options are or will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules. If these additional shares of common stock are sold, or if it is perceived that they will be sold, in the public market, the trading price of our common stock could decline.

Table of Contents

The holders of approximately 3,509,260 shares of our common stock, or approximately 17% of our total outstanding common stock as of March 31, 2015, are entitled to rights with respect to the registration of their shares under the Securities Act. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares purchased by affiliates, as defined in Rule 144 under the Securities Act. Any sales of securities by these stockholders could have a material adverse effect on the trading price of our common stock.

Our executive officers and directors have agreed that, subject to certain exceptions, during the period ending 90 days after the date of this prospectus supplement, they will not offer, sell, contract to sell, pledge or otherwise dispose of, directly or indirectly, any shares of our common stock or securities convertible into or exchangeable or exercisable for any shares of our common stock, enter into a transaction that would have the same effect, or enter into any swap, hedge or other arrangement that transfers, in whole or in part, any of the economic consequences of ownership of our common stock, whether any of these transactions are to be settled by delivery of our common stock or other securities, in cash or otherwise, or publicly disclose the intention to make any offer, sale, pledge or disposition, or to enter into any transaction, swap, hedge or other arrangement, without, in each case, the prior written consent of Leerink Partners LLC, who may release any of the securities subject to these lock-up agreements at any time without notice. Exceptions to the lock-up restrictions are described in more detail in this prospectus supplement under the caption "Underwriting."

Table of Contents

FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus, and the documents incorporated by reference herein and therein contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, that involve a number of risks and uncertainties. Although our forward-looking statements reflect the good faith judgment of our management, these statements can only be based on facts and factors currently known by us. Consequently, these forward-looking statements are inherently subject to risks and uncertainties, and actual results and outcomes may differ materially from results and outcomes discussed in the forward-looking statements.

Forward-looking statements can be identified by the use of forward-looking words such as "believes," "expects," "hopes," "may," "will," "plan," "intends," "estimates," "could," "should," "would," "continue," "seeks," "pro forma," or "anticipates," or other similar words (including their use in the negative), or by discussions of future matters such as the therapeutic potential of ProHema and our other product candidates, our clinical development plans, the timing for the commencement, receipt of data from, and completion of our preclinical studies and clinical trials, the development of new product candidates based on our research programs, our ability to develop product candidates and to receive payments under our collaboration agreement with Juno, possible changes in regulatory pathways and legislation and other statements that are not historical. These statements include but are not limited to statements under the captions "Business," "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" and in other sections incorporated by reference from our Annual Report on Form 10-K and Quarterly Reports on Form 10-Q, as applicable, as well as our other filings with the SEC. You should be aware that the occurrence of any of the events discussed under the heading "Risk Factors" in any applicable prospectus supplement and any documents incorporated by reference herein or therein could substantially harm our business, operating results and financial condition and that if any of these events occurs, it could adversely affect the value of an investment in our securities.

We qualify all of the forward-looking statements in the foregoing documents by these cautionary statements. Unless required by law, we undertake no obligation to update or revise any forward-looking statements to reflect new information or future events or developments. Thus, you should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements. Before deciding to purchase our common stock, you should carefully consider the risk factors incorporated by reference herein, in addition to the other information set forth in this prospectus supplement, the accompanying prospectus and in the documents incorporated by reference herein.

Table of Contents

USE OF PROCEEDS

We estimate that we will receive net proceeds of approximately \$37.9 million (or approximately \$43.6 million if the underwriters' option to purchase additional shares is exercised in full), based on an assumed public offering price of \$6.80 per share (the last reported sale price of our common stock on The NASDAQ Global Market on May 15, 2015), from the sale of the shares of common stock offered by us in this offering, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us.

We intend to use the net proceeds from this offering for:

Continued clinical development of ProHema, including the conduct of our PUMA, PROMPT and PROVIDE clinical trials;

Research and development of our other proprietary clinical and research candidates; and

Working capital and general corporate purposes, which may include in-licensing or acquiring other products or technologies.

The amounts and timing of these expenditures will depend on a number of factors, such as the timing, progress and results of our clinical trials and research and development efforts, the timing and progress of any collaborative activities, including those under our collaboration agreement with Juno, and the competitive environment for our product candidates. As of the date of this prospectus supplement, we cannot specify with certainty all of the particular uses for the net proceeds to us from this offering. Accordingly, our management will have broad discretion in the application of these proceeds. Pending these uses, we intend to invest the net proceeds in high quality, investment grade instruments, certificates of deposit or direct or guaranteed obligations of the U.S. government, or hold as cash.

Table of Contents**PRICE RANGE OF COMMON STOCK**

Our common stock began trading on The NASDAQ Global Market under the symbol "FATE" on September 30, 2013. Prior to that time, there was no public market for our common stock. The following table sets forth the high and low sale prices per share of our common stock, as reported on The NASDAQ Global Market, for the periods indicated:

	High	Low
Year ending December 31, 2015		
Second quarter (through May 15, 2015)	\$ 8.78	\$ 4.46
First quarter	5.50	4.54
Year ended December 31, 2014		
Fourth quarter	\$ 5.90	\$ 3.50
Third quarter	6.94	5.01
Second quarter	9.95	5.88
First quarter	13.55	5.85
Year ended December 31, 2013		
Fourth quarter	\$ 9.19	\$ 4.30

On May 15, 2015, the last reported sale price of our common stock as reported on The NASDAQ Global Market was \$6.80 per share. As of May 15, 2015, we had approximately 63 holders of record of our common stock. The actual number of stockholders is greater than this number of record holders and includes stockholders who are beneficial owners but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

Table of Contents

DIVIDEND POLICY

We have never declared or paid any dividends on our capital or common stock. We currently intend to retain all available funds and any future earnings, if any, to fund the development and expansion of our business and we do not anticipate paying any cash dividends in the foreseeable future. Any future determination to pay dividends will be made at the discretion of our board of directors.

S-16

Table of Contents**CAPITALIZATION**

The following table sets forth our cash and cash equivalents and capitalization as of March 31, 2015:

on an actual basis;

on a pro forma basis to give effect to our issuance and sale of 1,000,000 shares of our common stock to Juno in a private placement for gross proceeds of \$8.0 million(1) and our receipt of a \$5.0 million upfront payment from Juno, both of which occurred on May 7, 2015; and

on a pro forma as adjusted basis to give effect to our issuance and sale of 6,000,000 shares of our common stock in this offering at an assumed public offering price of \$6.80 per share, which was the last reported sale price of our common stock on The NASDAQ Global Market on May 15, 2015.

You should read the following table together with the "Use of Proceeds," our condensed consolidated financial statements and other financial data incorporated by reference in this prospectus supplement from our Annual Report on Form 10-K for the year ended December 31, 2014 and our Quarterly Report on Form 10-Q for the quarter ended March 31, 2015. All information is in thousands.

(in thousands, except share and per share data)	As of March 31, 2015		Pro Forma
	Actual	Pro Forma	As Adjusted
Cash and cash equivalents	42,349	55,349	93,249
Capitalization:			
Long-term debt (including current portion)	20,000	20,000	20,000
Stockholders' equity:			
Common stock, \$.001 par value; authorized shares 150,000,000; actual issued and outstanding shares 20,637,217; Pro forma issued and outstanding shares 21,637,217; Pro forma as adjusted issued and outstanding shares 27,637,217	21	22	28
Additional paid-in capital	141,503	149,502	187,396
Accumulated deficit	(120,273)	(120,273)	(120,273)
Total stockholders' equity	21,251	29,251	67,151
Total capitalization	41,251	49,251	87,151

The table above does not include, as of March 31, 2015:

2,957,629 shares of common stock issuable upon the exercise of outstanding stock options under our equity incentive plans, with a weighted-average exercise price of \$4.03 per share;

134,113 shares of common stock issuable upon the exercise of warrants outstanding as of March 31, 2015, with a weighted-average exercise price of \$4.92 per share;

1,242,736 shares of common stock available for issuance under the 2013 Plan, as well as any future increases in the number of shares of our common stock reserved for issuance under the 2013 Plan pursuant to evergreen provisions; and

(1)

The 1,000,000 shares of common stock, sold for gross proceeds of \$8.0 million, were issued concurrent with the Collaboration Agreement with Juno and at a premium above the then fair value of our common stock. The pro forma adjustment does not reflect the allocation of arrangement consideration to all deliverables, including the common stock, under the Juno arrangement in accordance with ASC 605-25-30.

S-17

Table of Contents

729,000 shares of common stock available for issuance under the ESPP, as well as any future increases in the number of shares of our common stock reserved for issuance under the ESPP pursuant to evergreen provisions.

S-18

Table of Contents**DILUTION**

Investors purchasing shares of our common stock in this offering will experience immediate and substantial dilution in the pro forma net tangible book value of their shares of common stock. Dilution in pro forma net tangible book value represents the difference between the public offering price per share and the pro forma net tangible book value per share of our common stock immediately after the offering.

The historical net tangible book value of our common stock as of March 31, 2015 was \$21.3 million, or \$1.03 per share. Historical net tangible book value per share of our common stock represents our total tangible assets (total assets less intangible assets) less total liabilities, divided by 20,637,217 shares of common stock outstanding as of that date.

The pro forma net tangible book value of our common stock as of March 31, 2015 was \$34.3 million, or \$1.58 per share. Pro forma net tangible book value per share of our common stock represents our total tangible assets less total liabilities, divided by the pro forma number of shares of our common stock outstanding on March 31, 2015, after giving effect to the issuance and sale of 1,000,000 shares of our common stock to Juno in a private placement for gross proceeds of \$8.0 million and our receipt of a \$5.0 million upfront payment from Juno, both of which occurred on May 7, 2015.

After giving effect to (1) the pro forma transaction described in the preceding paragraph, (2) the issuance of 6,000,000 shares of common stock in this offering and (3) the receipt of the net proceeds from the sale of 6,000,000 shares of common stock in this offering at an assumed public offering price of \$6.80 per share, which was the last reported sale price of our common stock on The NASDAQ Global Market on May 15, 2015, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of March 31, 2015 would have been approximately \$72.2 million, or \$2.61 per share of common stock. This represents an immediate increase in pro forma net tangible book value of \$1.03 per share to existing stockholders and an immediate dilution of \$4.19 in pro forma net tangible book value per share to new investors purchasing our common stock in this offering.

The following table illustrates this dilution on a per share basis to new investors:

Assumed public offering price per share	\$ 6.80
Historical net tangible book value per share as of March 31, 2015	\$ 1.03
Pro Forma increase in net tangible book value per share attributable to pro forma transaction described in paragraphs above	\$ 0.55
Pro Forma net tangible book value per share as of March 31, 2015	\$ 1.58
Increase in net tangible book value per share attributable to new investors purchasing shares in this offering after giving effect to May 2015 pro forma issuance and sale of common stock	\$ 1.03
As adjusted net tangible book value per share after giving effect to this offering	\$ 2.61
Dilution per share to new investors participating in this offering	\$ 4.19

If the underwriters exercise their option in full to purchase an additional 900,000 shares of common stock in this offering, the pro forma as adjusted net tangible book value per share after the offering would be \$2.73 per share, the increase in the pro forma net tangible book value per share to existing stockholders would be \$1.15 per share and the dilution to new investors purchasing our common stock in this offering would be \$4.07 per share.

The above discussion does not include:

2,957,629 shares of common stock issuable upon the exercise of outstanding stock options under our equity incentive plans, with a weighted-average exercise price of \$4.03 per share;

Table of Contents

134,113 shares of common stock issuable upon the exercise of warrants outstanding as of March 31, 2015, with a weighted-average exercise price of \$4.92 per share;

1,242,736 shares of common stock available for issuance under the 2013 Plan, as well as any future increases in the number of shares of our common stock reserved for issuance under the 2013 Plan pursuant to evergreen provisions; and

729,000 shares of common stock available for issuance under the ESPP, as well as any future increases in the number of shares of our common stock reserved for issuance under the ESPP pursuant to evergreen provisions.

The foregoing table and calculations assume no exercise of the outstanding stock options and warrants described above. To the extent that outstanding exercisable options or warrants are exercised, you may experience further dilution.

In addition, we may choose to raise additional capital due to market conditions or strategic considerations, even if we believe we have sufficient funds for our current or future operating plans. To the extent that we raise additional capital by issuing equity securities or convertible debt, your ownership will be further diluted.

To the extent that new options are issued under the 2013 Plan or we issue additional shares of common stock under the ESPP in the future, there will be further dilution to investors participating in this offering.

Table of Contents

**MATERIAL UNITED STATES FEDERAL INCOME TAX
CONSIDERATIONS FOR NON-U.S. HOLDERS**

The following is a summary of material U.S. federal income tax considerations of the ownership and disposition of our common stock by non-U.S. holders, as defined below. It is not intended to be a complete analysis of all the U.S. federal income tax considerations that may be relevant to non-U.S. holders. This summary is based upon the provisions of the Internal Revenue Code of 1986, as amended (the Code), U.S. Treasury regulations promulgated thereunder, administrative rulings and judicial decisions, all as of the date hereof. These authorities may be changed, possibly with retroactive effect, which may result in U.S. federal income tax consequences different from those set forth below. We have not sought any ruling from the Internal Revenue Service (the IRS) with respect to the statements made and the conclusions reached in the following summary. There can be no assurance that the IRS will agree with such statements and conclusions or that any contrary position taken by the IRS would not be sustained by a court.

This summary also does not address the tax considerations arising under the laws of any foreign, state or local jurisdiction, or any alternative minimum or net investment tax considerations. In addition, this discussion does not address tax considerations applicable to an investor's particular circumstances or to investors that may be subject to special tax rules, including, without limitation:

banks, insurance companies or other financial institutions;

tax-exempt organizations;

an integral part or controlled entity of a foreign sovereign;

dealers in securities or currencies;

traders in securities that elect to use a mark-to-market method of accounting for their securities holdings;

persons that own, or are deemed to own, more than five percent of our capital stock (except to the extent specifically set forth below);

controlled foreign corporations, passive foreign investment companies, and corporations that accumulate earnings to avoid U.S. federal income tax;

certain former citizens or long-term residents of the United States;

persons who hold our common stock as a position in a hedging transaction, "straddle," "conversion transaction" or other risk reduction transaction;

persons deemed to sell our common stock under the constructive sale provisions of the Code; or

persons who hold our common stock other than as a capital asset (generally, an asset held for investment purposes).

In addition, if a partnership holds our common stock, the tax treatment of a partner generally will depend on the status of the partner and upon the activities of the partnership. Accordingly, partnerships that hold our common stock, and partners in such partnerships, should consult their tax advisors.

YOU ARE URGED TO CONSULT YOUR TAX ADVISOR WITH RESPECT TO THE APPLICATION OF THE UNITED STATES FEDERAL INCOME TAX LAWS TO YOUR PARTICULAR SITUATION, AS WELL AS ANY TAX CONSEQUENCES OF THE PURCHASE, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK ARISING UNDER THE UNITED STATES FEDERAL ESTATE OR GIFT TAX RULES OR UNDER THE LAWS OF ANY STATE,

S-21

Table of Contents

LOCAL, FOREIGN OR OTHER TAXING JURISDICTION OR UNDER ANY APPLICABLE TAX TREATY.

Non-U.S. Holder Defined

For purposes of this discussion, a "non-U.S. holder" is a beneficial owner of a share of common stock received that is (i) a foreign corporation, (ii) a nonresident alien individual, or (iii) a foreign estate or trust that in either case is not subject to U.S. federal income tax on a net income basis on income or gain from a note or share of common stock.

Distributions

We have not made any distributions on our common stock and do not plan to make any distributions for the foreseeable future. However, if we do make distributions on our common stock, those payments will constitute dividends for U.S. tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. To the extent those distributions exceed both our current and our accumulated earnings and profits, they will constitute a return of capital and will first reduce your basis in our common stock, but not below zero, and then will be treated as gain from the sale of stock, which will be subject to tax as described in "Gain on Disposition of Common Stock", below.

Any dividend paid to you generally will be subject to U.S. withholding tax either at a rate of 30% of the gross amount of the dividend or such lower rate as may be specified by an applicable income tax treaty. In order to receive a reduced treaty rate, you must provide us with an IRS Form W-8BEN or other appropriate version of IRS Form W-8 or successor form certifying qualification for the reduced rate.

Dividends received by you that are effectively connected with your conduct of a U.S. trade or business (and, if an applicable income tax treaty so provides, that are attributable to a permanent establishment (or, if you are an individual, a fixed base) maintained by you within the United States) are exempt from such withholding tax. In order to obtain this exemption, you must provide us with an IRS Form W-8ECI or successor form properly certifying such exemption. Such effectively connected dividends, although not subject to withholding tax, are taxed at the same graduated rates applicable to U.S. persons, net of certain deductions and credits. In addition, if you are a corporate non-U.S. holder, dividends you receive that are effectively connected with your conduct of a U.S. trade or business may also be subject to a branch profits tax at a rate of 30% or such lower rate as may be specified by an applicable income tax treaty.

If you are eligible for a reduced rate of withholding tax pursuant to a tax treaty, you may obtain a refund of any excess amounts withheld if you file an appropriate claim for refund with the IRS.

Gain on Disposition of Common Stock

You generally will not be required to pay U.S. federal income tax on any gain realized upon the sale or other disposition of our common stock unless:

the gain is effectively connected with your conduct of a U.S. trade or business (and, if an applicable income tax treaty so provides, the gain is attributable to a permanent establishment (or, if you are an individual, a fixed base) maintained by you within the United States);

you are an individual non-U.S. holder who holds our common stock as a capital asset, who is present in the United States for a period or periods aggregating 183 days or more during the calendar year in which the sale or disposition occurs and certain other conditions are met; or

Table of Contents

our common stock constitutes a U.S. real property interest by reason of our status as a "United States real property holding corporation" for U.S. federal income tax purposes, or USRPHC, at any time within the shorter of the five-year period preceding the disposition or your holding period for our common stock.

If you are a non-U.S. holder described in the first bullet above, you will be required to pay tax on the net gain derived from the sale under regular graduated U.S. federal income tax rates. Corporate non-U.S. holders described in the first bullet above may be subject to an additional branch profits tax at a 30% rate or such lower rate as may be specified by an applicable income tax treaty. If you are an individual non-U.S. holder described in the second bullet above, you will be required to pay a flat 30% tax on the gain derived from the sale, which may be offset by U.S.-source capital losses (even though you are not considered a resident of the United States). You should consult any applicable income tax or other treaties, which may provide different rules.

We believe that we are not currently and will not become a USRPHC. However, because the determination of whether we are a USRPHC depends on the fair market value of our U.S. real property relative to the fair market value of our other business assets, there can be no assurance that we will not become a USRPHC in the future. Even if we become a USRPHC, however, as long as our common stock is regularly traded on an established securities market, such common stock will be treated as U.S. real property interests only if you actually or constructively hold more than five percent of such regularly traded common stock at any time during the shorter of the five-year period preceding the disposition or your holding period for our common stock. If gain on the sale or other taxable disposition of our stock is ever subject to tax because we are a USRPHC, you would be subject to regular U.S. federal income tax with respect to such gain, generally in the same manner as a U.S. person.

Backup Withholding and Information Reporting

Generally, we must report annually to the IRS the amount of dividends paid to you, your name and address, and the amount of tax withheld, if any. A similar report will be sent to you. Pursuant to applicable income tax treaties or other agreements, the IRS may make these reports available to tax authorities in your country of residence.

Payments of dividends or of proceeds on the disposition of stock made to you may be subject to information reporting and backup withholding (currently at a rate of 28%) unless you establish an exemption, for example by properly certifying your non-U.S. status on a Form W-8BEN or another appropriate version of IRS Form W-8 or successor form. Notwithstanding the foregoing, backup withholding and information reporting may apply if either we or our paying agent has actual knowledge, or reason to know, that you are a U.S. person.

Backup withholding is not an additional tax; rather, the U.S. income tax liability of persons subject to backup withholding will be reduced by the amount of tax withheld. If withholding results in an overpayment of taxes, a refund or credit may be obtained, provided that the required information is furnished to the IRS in a timely manner. Non-U.S. holders should consult their tax advisors regarding the application of the information reporting and backup withholding rules to them.

Withholding and Information Reporting Requirements FATCA

The Foreign Account Tax Compliance Act, or FATCA, generally imposes a U.S. federal withholding tax at a rate of 30% on payments of dividends on, or gross proceeds from the sale or other disposition of, our common stock paid to a foreign entity unless (i) if the foreign entity is a "foreign financial institution," such foreign entity undertakes certain due diligence, reporting, withholding, and certification obligations, (ii) if the foreign entity is not a "foreign financial institution," such foreign entity identifies certain of its U.S. investors, if any, or (iii) the foreign entity is otherwise exempt under

Table of Contents

FATCA. Under applicable U.S. Treasury regulations, withholding under FATCA currently applies to payments of dividends on our common stock, but will only apply to payments of gross proceeds from a sale or other disposition of our common stock made after December 31, 2016. Under certain circumstances, a non-U.S. holder may be eligible for refunds or credits of the tax. An intergovernmental agreement between the United States and an applicable foreign country may modify the requirements described in this paragraph. Non-U.S. holders should consult their own tax advisors regarding the possible implications of this legislation on their investment in our common stock and the entities through which they hold our common stock, including, without limitation, the process and deadlines for meeting the applicable requirements to prevent the imposition of the 30% withholding tax under FATCA.

Table of Contents

UNDERWRITING

Leerink Partners LLC and BMO Capital Markets Corp. are acting as joint book-running managers for this offering, with Leerink Partners LLC acting as the sole representative of the underwriters named below. Subject to the terms and conditions set forth in an underwriting agreement among us and the underwriters, we have agreed to sell to the underwriters, and each of the underwriters has agreed, severally and not jointly, to purchase from us, the number of shares of common stock set forth opposite its name below.

Underwriter	Number of Shares
Leerink Partners LLC	
BMO Capital Markets Corp.	
Wedbush Securities Inc.	
H.C. Wainwright & Co., LLC	
Total	

Subject to the terms and conditions set forth in the underwriting agreement, the underwriters have agreed, severally and not jointly, to purchase all of the shares sold under the underwriting agreement if any of the shares are purchased. If an underwriter defaults, the underwriting agreement provides that the purchase commitments of the non-defaulting underwriters may be increased or the underwriting agreement may be terminated.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act, or to contribute to payments the underwriters may be required to make in respect of those liabilities.

The underwriters are offering the shares, subject to prior sale, when, as and if issued to and accepted by them, subject to approval of legal matters by their counsel, including the validity of the shares, and other conditions contained in the underwriting agreement, such as the receipt by the underwriters of officers' certificates and legal opinions. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

Commissions and Discounts

The representative has advised us that the underwriters propose initially to offer the shares to the public at the public offering price set forth on the cover page of this prospectus supplement and to dealers at that price less a concession not in excess of \$ _____ per share. After the initial offering of the shares, the public offering price, concession or any other term of the offering may be changed by the representative.

The following table shows the public offering price, underwriting discounts and commissions and proceeds before expenses to us. The information assumes either no exercise or full exercise by the underwriters of their option to purchase additional shares of our common stock.

	Per Share	Total	
		Without Option	With Option
Public offering price	\$	\$	\$
Underwriting discounts and commissions	\$	\$	\$
Proceeds, before expenses, to us	\$	\$	\$

We estimate expenses payable by us in connection with this offering, other than the underwriting discounts and commissions referred to above, will be approximately \$500,000. We also have agreed to

Table of Contents

reimburse the underwriters for up to \$35,000 for their FINRA counsel fee. In accordance with FINRA Rule 5110, this reimbursed fee is deemed underwriting compensation for this offering.

Option to Purchase Additional Shares

We have granted an option to the underwriters, exercisable for 30 days after the date of this prospectus supplement, to purchase up to 900,000 additional shares at the public offering price, less the underwriting discounts and commissions. If the underwriters exercise this option, each underwriter will be obligated, subject to conditions contained in the underwriting agreement, to purchase a number of additional shares proportionate to that underwriter's initial amount reflected in the above table.

No Sales of Similar Securities

We have agreed that we will not offer, sell, issue, contract to sell, pledge or otherwise dispose of, directly or indirectly, or file with the Securities and Exchange Commission a registration statement under the Securities Act of 1933, as amended (the Securities Act) relating to, any shares of our common stock or securities convertible into or exchangeable or exercisable for any shares of our common stock, or publicly disclose the intention to make any offer, sale, pledge, disposition or filing, without the prior written consent of the representative for a period of 90 days after the date of the underwriting agreement related to this offering except (a) pursuant to the underwriting agreement related to this offering, (b) issuances pursuant to the conversion or exchange of convertible or exchangeable securities outstanding as of the date of the underwriting agreement related to this offering or the exercise of warrants or options outstanding as of the date of the underwriting agreement related to this offering, (c) grants of employee stock options or other securities pursuant to our existing plans or issuances pursuant to the exercise of such employee options or (d) issuances in connection with any acquisition, collaboration, merger, licensing or other joint venture or strategic transaction involving us, provided that, in the case of clause (d), such issuances shall not be greater than 5% of our total outstanding shares immediately following the closing of this offering.

Our executive officers and directors and certain of our other existing security holders have agreed that they will not offer, sell, contract to sell, pledge or otherwise dispose of, sell any option to purchase, purchase any option of, grant any option, right or warrant to purchase, or make any short sale of, directly or indirectly, any shares of our common stock or securities convertible into or exchangeable or exercisable for any shares of our common stock, enter into a transaction that would have the same effect, or enter into any swap, hedge or other arrangement that transfers, in whole or in part, any of the economic consequences of ownership of our common stock, whether any of these transactions are to be settled by delivery of our common stock or other securities, in cash or otherwise, make any demand for or exercise any right with respect to the registration of any shares of our common stock or any security convertible into or exercisable or exchangeable for any shares of our common stock, or publicly disclose the intention to do any of the foregoing, without, in each case, the prior written consent of the representative, for a period of 90 days after the date of the final prospectus, subject to limited exceptions. This lockup provision applies to common stock owned now or acquired later by the person executing the agreement or for which the person executing the agreement later acquires the power of disposition.

NASDAQ Global Market Listing

Our common stock is listed on The NASDAQ Global Market under the symbol "FATE."

Price Stabilization, Short Positions and Penalty Bids

Until the distribution of the shares is completed, SEC rules may limit underwriters and selling group members from bidding for and purchasing our common stock. However, the representative may

Table of Contents

engage in transactions that stabilize the price of the common stock, such as bids or purchases to peg, fix or maintain that price.

In connection with the offering, the underwriters may purchase and sell our common stock in the open market. These transactions may include short sales, purchases on the open market to cover positions created by short sales and stabilizing transactions. Short sales involve the sale by the underwriters of a greater number of shares than they are required to purchase in the offering. "Covered" short sales are sales made in an amount not greater than the underwriters' option described above. The underwriters may close out any covered short position by either exercising their option or purchasing shares in the open market. In determining the source of shares to close out the covered short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared to the price at which they may purchase shares through the option granted to them. "Naked" short sales are sales in excess of such option. The underwriters must close out any naked short position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of our common stock in the open market after pricing that could adversely affect investors who purchase in the offering. Stabilizing transactions consist of various bids for or purchases of shares of common stock made by the underwriters in the open market prior to the closing of the offering.

The underwriters may also impose a penalty bid. This occurs when a particular underwriter repays to the underwriters a portion of the underwriting discount received by it because the representative has repurchased shares sold by or for the account of such underwriter in stabilizing or short covering transactions.

Similar to other purchase transactions, the underwriters' purchases to cover the syndicate short sales may have the effect of raising or maintaining the market price of our common stock or preventing or retarding a decline in the market price of our common stock. As a result, the price of our common stock may be higher than the price that might otherwise exist in the open market. The underwriters may conduct these transactions on The NASDAQ Global Market, in the over-the-counter market or otherwise.

Neither we nor any of the underwriters make any representation or prediction as to the direction or magnitude of any effect that the transactions described above may have on the price of our common stock. In addition, neither we nor any of the underwriters make any representation that the representative will engage in these transactions or that these transactions, once commenced, will not be discontinued without notice.

The underwriters may also engage in passive market making transactions in our common stock on The NASDAQ Global Market in accordance with Rule 103 of Regulation M during a period before the commencement of offers or sales of shares of our common stock in this offering and extending through the completion of distribution. A passive market maker must display its bid at a price not in excess of the highest independent bid of that security. However, if all independent bids are lowered below the passive market maker's bid, that bid must then be lowered when specified purchase limits are exceeded.

Electronic Distribution

In connection with the offering, certain of the underwriters or securities dealers may distribute prospectuses by electronic means, such as e-mail.

Other Relationships

The underwriters and certain of their affiliates are full service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, investment research, principal investment, hedging, financing and

Table of Contents

brokerage activities. Some of the underwriters and certain of their affiliates may in the future engage in investment banking and other commercial dealings in the ordinary course of business with us and our affiliates, for which they may in the future receive customary fees, commissions and expenses.

In addition, in the ordinary course of their business activities, the underwriters and their affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers.

Such investments and securities activities may involve securities and/or instruments of ours or our affiliates. The underwriters and their affiliates may also make investment recommendations and/or publish or express independent research views in respect of such securities or financial instruments and may hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

Selling Restrictions

Notice to Prospective Investors in the European Economic Area

In relation to each Member State of the European Economic Area (each, a "Relevant Member State"), no offer of shares may be made to the public in that Relevant Member State other than:

- A. to any legal entity which is a qualified investor as defined in the Prospectus Directive;
- B. to fewer than 100 or, if the Relevant Member State has implemented the relevant provision of the 2010 PD Amending Directive, 150, natural or legal persons (other than qualified investors as defined in the Prospectus Directive), as permitted under the Prospectus Directive, subject to obtaining the prior consent of the representative; or
- C. in any other circumstances falling within Article 3(2) of the Prospectus Directive, provided that no such offer of shares shall require the Company or the representative to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive.

Each person in a Relevant Member State who initially acquires any shares or to whom any offer is made will be deemed to have represented, acknowledged and agreed that it is a "qualified investor" within the meaning of the law in that Relevant Member State implementing Article 2(1)(e) of the Prospectus Directive. In the case of any shares being offered to a financial intermediary as that term is used in Article 3(2) of the Prospectus Directive, each such financial intermediary will be deemed to have represented, acknowledged and agreed that the shares acquired by it in the offer have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an offer of any shares to the public other than their offer or resale in a Relevant Member State to qualified investors as so defined or in circumstances in which the prior consent of the representative has been obtained to each such proposed offer or resale.

We, the representative and each of our and the representative's affiliates will rely upon the truth and accuracy of the foregoing representations, acknowledgements and agreements.

This prospectus has been prepared on the basis that any offer of shares in any Relevant Member State will be made pursuant to an exemption under the Prospectus Directive from the requirement to publish a prospectus for offers of shares. Accordingly any person making or intending to make an offer in that Relevant Member State of shares which are the subject of the offering contemplated in this prospectus may only do so in circumstances in which no obligation arises for the company or any of the underwriters to publish a prospectus pursuant to Article 3 of the Prospectus Directive in relation to such offer. Neither the company nor the underwriters have authorized, nor do they authorize, the

Table of Contents

making of any offer of shares in circumstances in which an obligation arises for the company or the underwriters to publish a prospectus for such offer.

For the purpose of the above provisions, the expression "an offer to the public" in relation to any shares in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the shares to be offered so as to enable an investor to decide to purchase or subscribe the shares, as the same may be varied in the Relevant Member State by any measure implementing the Prospectus Directive in the Relevant Member State and the expression "Prospectus Directive" means Directive 2003/71/EC (including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member States) and includes any relevant implementing measure in the Relevant Member State and the expression "2010 PD Amending Directive" means Directive 2010/73/EU.

Table of Contents

LEGAL MATTERS

The validity of the shares of common stock being offered by this prospectus supplement will be passed upon for us by Goodwin Procter LLP, San Francisco, California. The underwriters are being represented by K&L Gates LLP, Irvine, California.

EXPERTS

The consolidated financial statements of Fate Therapeutics, Inc. appearing in our Annual Report (Form 10-K) for the year ended December 31, 2014 have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their report thereon, included therein, and incorporated herein by reference. Such consolidated financial statements are incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus supplement and the accompanying prospectus are part of the registration statement on Form S-3 we filed with the SEC under the Securities Act and do not contain all the information set forth in the registration statement. Whenever a reference is made in this prospectus supplement or the accompanying prospectus to any of our contracts, agreements or other documents, the reference may not be complete and you should refer to the exhibits that are a part of the registration statement or the exhibits to the reports or other documents incorporated by reference in this prospectus supplement and the accompanying prospectus for a copy of such contract, agreement or other document. Because we are subject to the information and reporting requirements of the Exchange Act, we file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at <http://www.sec.gov>. You may also read and copy any document we file at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the Public Reference Room.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" the information we file with it, which means that we can disclose important information to you by referring you to those documents. Information incorporated by reference is part of this prospectus supplement and the accompanying prospectus. Later information filed with the SEC will update and supersede this information.

We incorporate by reference the documents listed below and any future filings made with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus supplement until the termination of the offering of the shares covered by this prospectus supplement (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items):

our Annual Report on Form 10-K for the fiscal year ended December 31, 2014 filed with the SEC on March 12, 2015 and amendments thereto;

our definitive proxy statement on Schedule 14A, filed with the SEC on April 2, 2015 (with respect to those portions incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2014);

our Quarterly Report on Form 10-Q for the quarter ended March 31, 2015 filed with the SEC on May 7, 2015;

Edgar Filing: FATE THERAPEUTICS INC - Form 424B5

Table of Contents

our Current Reports on Form 8-K (other than information furnished rather than filed in such Current Reports) filed with the SEC on January 7, 2015, January 30, 2015 and both filings made on May 6, 2015; and

the description of our common stock which is registered under Section 12 of the Exchange Act, in our registration statement on Form 8-A, filed with the SEC on September 17, 2013, including any amendments or reports filed for the purpose of updating such description.

Upon request, we will provide, without charge, to each person, including any beneficial owner, to whom a copy of this prospectus supplement is delivered, a copy of the documents incorporated by reference into this prospectus supplement but not delivered with the prospectus supplement. You may request a copy of these filings, and any exhibits we have specifically incorporated by reference as an exhibit in this prospectus supplement, at no cost by writing or telephoning us at the following address:

Fate Therapeutics, Inc., 3535 General Atomics Court, Suite 200, San Diego, CA 92121, Attention: Secretary, or by telephone request to (858) 875-1800.

In accordance with Rule 412 of the Securities Act, any statement contained in a document incorporated by reference herein shall be deemed modified or superseded to the extent that a statement contained herein or in any other subsequently filed document which also is or is deemed to be incorporated by reference herein modifies or supersedes such statement.

S-31

Table of Contents

PROSPECTUS

\$100,000,000

**Common Stock
Preferred Stock
Debt Securities
Warrants
Units**

We may from time to time issue, in one or more series or classes, up to \$100,000,000 in aggregate principal amount of our common stock, preferred stock, debt securities, warrants and/or units. We may offer these securities separately or together in units. We will specify in the accompanying prospectus supplement the terms of the securities being offered. We may sell these securities to or through underwriters and also to other purchasers or through agents. We will set forth the names of any underwriters or agents, and any fees, conversions or discount arrangements, in the accompanying prospectus supplement. We may not sell any securities under this prospectus without delivery of the applicable prospectus supplement.

You should read this document and any prospectus supplement or amendment carefully before you invest in our securities.

Our common stock is listed on The NASDAQ Global Select Market under the symbol "FATE." On September 30, 2014, the closing price for our common stock, as reported on The NASDAQ Global Select Market, was \$5.10 per share. Our principal executive offices are located at 3535 General Atomics Court, Suite 200, San Diego, CA 92121.

Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading "Risk Factors" contained in this prospectus beginning on page 1 and any applicable prospectus supplement, and under similar headings in the other documents that are incorporated by reference into this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this Prospectus is October 15, 2014.

Table of Contents

TABLE OF CONTENTS

	Page
<u>About this Prospectus</u>	<u>1</u>
<u>Risk Factors</u>	<u>1</u>
<u>Cautionary Statement Regarding Forward-Looking Statements</u>	<u>2</u>
<u>The Company</u>	<u>3</u>
<u>Ratio of Earnings to Fixed Charges</u>	<u>4</u>
<u>Use of Proceeds</u>	<u>4</u>
<u>Securities We May Offer</u>	<u>4</u>
<u>Description of Capital Stock</u>	<u>5</u>
<u>Description of Debt Securities</u>	<u>9</u>
<u>Description of Warrants</u>	<u>25</u>
<u>Description of Units</u>	<u>26</u>
<u>Plan of Distribution</u>	<u>29</u>
<u>Legal Matters</u>	<u>32</u>
<u>Experts</u>	<u>32</u>
<u>Where You Can Find More Information</u>	<u>32</u>
<u>Incorporation by Reference</u>	<u>32</u>

Table of Contents

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, using a "shelf" registration process. Under this shelf registration process, we may from time to time sell any combination of the securities described in this prospectus in one or more offerings for an aggregate initial offering price of up to \$100,000,000.

This prospectus provides you with a general description of the securities we may offer. Each time we sell securities, we will provide one or more prospectus supplements that will contain specific information about the terms of the offering. The prospectus supplement may also add, update or change information contained in this prospectus. You should read both this prospectus and the accompanying prospectus supplement together with the additional information described under the heading "Where You Can Find More Information" beginning on page 32 of this prospectus.

You should rely only on the information contained in or incorporated by reference in this prospectus, any accompanying prospectus supplement or in any related free writing prospectus filed by us with the SEC. We have not authorized anyone to provide you with different information. This prospectus and the accompanying prospectus supplement do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the securities described in the accompanying prospectus supplement or an offer to sell or the solicitation of an offer to buy such securities in any circumstances in which such offer or solicitation is unlawful. You should assume that the information appearing in this prospectus, any prospectus supplement, the documents incorporated by reference and any related free writing prospectus is accurate only as of their respective dates. Our business, financial condition, results of operations and prospects may have changed materially since those dates.

Unless the context otherwise indicates, references in this prospectus to "Fate Therapeutics", "we", "our", "us" and "the Company" refer, collectively, to Fate Therapeutics, Inc., a Delaware corporation.

RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully consider the risks described below and in the documents incorporated by reference in this prospectus and any prospectus supplement, as well as other information we include or incorporate by reference into this prospectus and any applicable prospectus supplement, before making an investment decision. Our business, financial condition or results of operations could be materially adversely affected by the materialization of any of these risks. The trading price of our securities could decline due to the materialization of any of these risks, and you may lose all or part of your investment. This prospectus and the documents incorporated herein by reference also contain forward-looking statements that involve risks and uncertainties. Actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks described below and in the documents incorporated herein by reference, including (i) our annual report on Form 10-K for the fiscal year ended December 31, 2013, which is on file with the SEC and is incorporated herein by reference, (ii) our quarterly reports on Form 10-Q for the quarters ended March 31, 2014 and June 30, 2014, which are incorporated by reference into this prospectus, and (iii) other documents we file with the SEC that are deemed incorporated by reference into this prospectus.

Table of Contents

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, including the documents that we incorporate by reference, contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Any statements about our expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and may be forward-looking. These statements are often, but are not always, made through the use of words or phrases such as "may," "will," "could," "should," "expects," "intends," "plans," "anticipates," "believes," "estimates," "predicts," "projects," "potential," "continue," and similar expressions, or the negative of these terms, or similar expressions. Accordingly, these statements involve estimates, assumptions and uncertainties which could cause actual results to differ materially from those expressed in them. Any forward-looking statements are qualified in their entirety by reference to the factors discussed throughout this report, and in particular those factors referenced in the section "Risk Factors."

This prospectus contains forward-looking statements that are based on our management's belief and assumptions and on information currently available to our management. These statements relate to future events or our future financial performance, and involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by these forward-looking statements. Forward-looking statements include, but are not limited to, statements about:

our ability to complete the preclinical or clinical development of, obtain regulatory approval for, or successfully commercialize our product candidates;

our expectations of safety and improved potency and efficacy of ProHema arising from the use of our nutrient-rich media, or NRM, formulation in the product's manufacture, in our Phase 2 clinical trial of ProHema in adults undergoing double umbilical cord blood transplant, or UCBT, for the treatment of hematologic malignancies, or the PUMA study, and in our other planned clinical trials of ProHema;

the timing of availability or release of data from clinical trials, including our PUMA study and our other planned clinical trials of ProHema;

our plans to conduct clinical trials of ProHema in pediatric patients, including in pediatric patients undergoing single UCBT for the treatment of hematologic malignancies and pediatric patients undergoing single UCBT for the treatment of inherited metabolic disorders, or IMDs, including certain lysosomal storage disorders, or LSDs, and our plans to use a reduced volume formulation of ProHema in these patient populations;

our projected timing of initiation, rate of enrollment and duration of our clinical trials, and our ability to design appropriate clinical trial protocols and reach agreement on trial design and clinical endpoints with investigators and regulatory authorities, for our product candidates;

the ability to manufacture our product candidates, including the ability of clinical cell processing facilities operated by or affiliated with our clinical sites to manufacture ProHema consistently and under the proper conditions, as required for preclinical or clinical development or commercial activities and in a manner that complies with regulatory requirements;

our ability to successfully complete the preclinical development of our Wnt7a analogs for muscle regeneration, and the timing of these activities;

our plans to utilize our human induced pluripotent stem cell, or hiPSC, platform for the research and development of hiPSC-derived cellular therapeutics, including hiPSC-derived myogenic progenitor cells;

Table of Contents

our ability to obtain regulatory approval to commercialize ProHema or any of our other product candidates, many of which are new and still evolving;

the performance of third-party service providers and independent contractors, upon whom we rely to conduct our preclinical studies and clinical trials and to manufacture our product candidates and certain components of our product candidates;

our ability to discover, manufacture, develop and commercialize innovative therapeutics using our proprietary platforms, the cost, timing and success of which is difficult to predict;

our ability to develop sales and marketing capabilities for our product candidates, or to enter into strategic partnerships to discover, manufacture, develop and commercialize innovative therapeutics using our product platforms;

the potential therapeutic value, and the timing and success of the commercialization, of ProHema or any of our other product candidates;

the potential price and degree of market acceptance of stem cell-based therapeutics in general and our product candidates in particular;

the size and growth of the potential markets for our product candidates and our ability to serve those markets;

regulatory developments and approval pathways in the United States and foreign countries for stem cell-based therapeutics in general and our product candidates in particular;

our ability to obtain, maintain, defend and enforce intellectual property rights protecting our product candidates, and our ability to develop and commercialize our product candidates without infringing the proprietary rights of third parties;

our ability to access additional funds and to comply with our obligations under our loan facility with Silicon Valley Bank;

the accuracy of our estimates regarding revenues, expenses and capital requirements; and

the additional risks and other factors described under the caption "Risk Factors" in this prospectus and any prospectus supplement that we may file.

THE COMPANY

We are a clinical-stage biopharmaceutical company engaged in the discovery and development of pharmacologic modulators of adult stem cells to treat orphan diseases, including certain hematologic malignancies, inherited metabolic disorders, or IMDs, including lysosomal storage disorders, or LSDs, and muscular dystrophies. Our novel approach utilizes small molecules and therapeutic proteins, and targets well-characterized biological mechanisms, to program the fate of adult stem cells. Our lead product candidate, ProHema, is an *ex vivo* programmed hematopoietic stem cell, or HSC, therapeutic, which is currently in Phase 2 clinical development for adult patients with hematologic malignancies undergoing HSC transplantation. In addition, we are evaluating the *in vivo* programming of muscle satellite stem cells using our novel Wnt7a-based protein analogs in preclinical models of muscle regeneration, and are using our proprietary reprogramming platform to develop human induced pluripotent stem cell-, or hiPSC-, derived cellular therapeutics. We believe that our product candidates have

Edgar Filing: FATE THERAPEUTICS INC - Form 424B5

significant potential as life-changing or curative therapeutics across a broad range of orphan indications.

We own various U.S. federal trademark registrations and applications, and unregistered trademarks, including Fate Therapeutics®, our corporate logo and ProHema®.

Table of Contents

Our principal executive offices are located at 3535 General Atomics Court, Suite 200, San Diego, CA 92121 and our telephone number is (858) 875-1800.

RATIO OF EARNINGS TO FIXED CHARGES

The following table sets forth our ratio of earnings to fixed charges for the periods shown. You should read this table in conjunction with the financial statements and notes incorporated by reference in this prospectus. We have no preferred shares outstanding and paid no dividends on preferred shares during the periods indicated. Therefore, the ratios of earnings to combined fixed charges and preferred dividends are the same as the ratios of earnings to fixed charges presented below.

	Years Ended December 31,			Six Months Ended
	2013	2012	2011	June 30, 2014
Ratio of Earnings to Fixed Charges	N/A	N/A	N/A	N/A

For purposes of calculating the ratios in the table above, earnings consist of net loss before income taxes. Fixed charges include interest expense on indebtedness and an estimate of the interest expense within rental expense.

Due to our net losses for the years ended December 31, 2013, 2012 and 2011 and for the six months ended June 30, 2014, earnings were insufficient to cover fixed charges for such periods and we are unable to disclose a ratio of earnings to fixed charges for such periods. The dollar amount of the deficiency in earnings available for fixed charges for the years ended December 31, 2013, 2012 and 2011 and the six months ended June 30, 2014 was approximately \$19.9 million, \$13.6 million, \$13.1 million and \$12.9 million, respectively.

USE OF PROCEEDS

We intend to use the net proceeds from the sale of any securities offered under this prospectus for general corporate purposes unless otherwise indicated in the applicable prospectus supplement. General corporate purposes may include research and development costs to support the advancement of our product candidates, including the clinical development of ProHema and the preclinical development of our Wnt7a protein analog product candidates, and the expansion of our product candidate pipeline, including researching therapeutic applications of human induced pluripotent stem cell derived cellular therapeutics; in-licensing of additional product candidates or intellectual property; repayment and refinancing of debt; working capital; and capital expenditures. We may temporarily invest the net proceeds in a variety of capital preservation instruments, including high quality, investment grade instruments, certificates of deposit or direct or guaranteed obligations of the U.S. government, or may hold such proceeds as cash, until they are used for their stated purpose. We have not determined the amount of net proceeds to be used specifically for such purposes. As a result, management will retain broad discretion over the allocation of net proceeds.

SECURITIES WE MAY OFFER

This prospectus contains summary descriptions of the securities we may offer from time to time. These summary descriptions are not meant to be complete descriptions of each security. The particular terms of any security will be described in the applicable prospectus supplement.

Table of Contents

DESCRIPTION OF CAPITAL STOCK

The following description of our common stock and preferred stock, together with the additional information we include in any applicable prospectus supplements, summarizes the material terms and provisions of the common stock and preferred stock that we may offer under this prospectus. The following description of our capital stock does not purport to be complete and is subject to, and qualified in its entirety by, our certificate of incorporation and bylaws, which are exhibits to the registration statement of which this prospectus forms a part, and by applicable law. The terms of our common stock and preferred stock may also be affected by Delaware law.

Authorized Capital Stock

Our authorized capital stock consists of 150,000,000 shares of common stock, par value \$0.001 per share, and 5,000,000 shares of preferred stock, par value \$0.001 per share. As of September 30, 2014, we had 20,562,773 shares of common stock outstanding and no shares of preferred stock outstanding.

Common Stock

The holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of the stockholders. The holders of our common stock do not have any cumulative voting rights. Holders of our common stock are entitled to receive ratably any dividends declared by the board of directors out of funds legally available for that purpose, subject to any preferential dividend rights of any outstanding preferred stock. Our common stock has no preemptive rights, conversion rights or other subscription rights or redemption or sinking fund provisions.

In the event of our liquidation, dissolution or winding up, holders of our common stock will be entitled to share ratably in all assets remaining after payment of all debts and other liabilities and any liquidation preference of any outstanding preferred stock. All outstanding shares are fully paid and nonassessable.

When we issue shares of common stock under this prospectus, the shares will fully be paid and nonassessable and will not have, or be subject to, any preemptive or similar rights.

Listing

Our common stock is listed on The NASDAQ Global Select Market under the symbol "FATE." On September 30, 2014, the closing price for our common stock, as reported on The NASDAQ Global Select Market, was \$5.10 per share. As of September 30, 2014, we had approximately 65 stockholders of record.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC. The transfer agent and registrar's address is 6201 15th Avenue, Brooklyn, NY 11219.

Preferred Stock

Our board of directors is authorized to issue up to 5,000,000 shares of preferred stock in one or more series without stockholder approval. Our board of directors may determine the rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences, of each series of preferred stock.

The purpose of authorizing our board of directors to issue preferred stock in one or more series and determine the number of shares in the series and its rights and preferences is to eliminate delays

Table of Contents

associated with a stockholder vote on specific issuances. Examples of rights and preferences that the Board may fix are:

dividend rights;

dividend rates;

conversion rights;

voting rights;

terms of redemption; and

liquidation preferences.

The existence of authorized but unissued shares of preferred stock may enable our board of directors to render more difficult or to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise. For example, if in the due exercise of its fiduciary obligations, our board of directors were to determine that a takeover proposal is not in the best interests of us or our stockholders, our board of directors could cause shares of preferred stock to be issued without stockholder approval in one or more private offerings or other transactions that might dilute the voting or other rights of the proposed acquirer, stockholder or stockholder group. The rights of holders of our common stock described above, will be subject to, and may be adversely affected by, the rights of any preferred stock that we may designate and issue in the future. The issuance of shares of preferred stock could decrease the amount of earnings and assets available for distribution to holders of shares of common stock. The issuance may also adversely affect the rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring or preventing a change in control of us.

We will incorporate by reference as an exhibit to the registration statement, which includes this prospectus, the form of any certificate of designation that describes the terms of the series of preferred stock we are offering. This description and the applicable prospectus supplement will include:

the title and stated value;

the number of shares authorized;

the liquidation preference per share;

the purchase price;

the dividend rate, period and payment date, and method of calculation for dividends;

whether dividends will be cumulative or non-cumulative and, if cumulative, the date from which dividends will accumulate;

the procedures for any auction and remarketing, if any;

Edgar Filing: FATE THERAPEUTICS INC - Form 424B5

the provisions for a sinking fund, if any;

the provisions for redemption or repurchase, if applicable, and any restrictions on our ability to exercise those redemption and repurchase rights;

any listing of the preferred stock on any securities exchange or market;

whether the preferred stock will be convertible into our common stock, and, if applicable, the conversion price, or how it will be calculated, and the conversion period;

whether the preferred stock will be exchangeable into debt securities, and, if applicable, the exchange price, or how it will be calculated, and the exchange period;

Table of Contents

voting rights, if any, of the preferred stock;

preemptive rights, if any;

restrictions on transfer, sale or other assignment, if any;

whether interests in the preferred stock will be represented by depositary shares;

a discussion of any material United States federal income tax considerations applicable to the preferred stock;

the relative ranking and preferences of the preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs;

any limitations on issuance of any class or series of preferred stock ranking senior to or on a parity with the series of preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs; and

any other specific terms, preferences, rights or limitations of, or restrictions on, the preferred stock.

When we issue shares of preferred stock under this prospectus, the shares will fully be paid and nonassessable and will not be subject to any preemptive or similar rights.

Provisions of our Certificate of Incorporation and By-Laws and Delaware Anti-Takeover Law

Certain provisions of the Delaware General Corporation Law and of our certificate of incorporation and by-laws could have the effect of delaying, deferring or discouraging another party from acquiring control of us. These provisions, which are summarized below, are expected to discourage certain types of coercive takeover practices and inadequate takeover bids and, as a consequence, they might also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions are also designed in part to encourage anyone seeking to acquire control of us to first negotiate with our board of directors. These provisions might also have the effect of preventing changes in our management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders might otherwise deem to be in their best interests. However, we believe that the advantages gained by protecting our ability to negotiate with any unsolicited and potentially unfriendly acquirer outweigh the disadvantages of discouraging such proposals, including those priced above the then-current market value of our common stock, because, among other reasons, the negotiation of such proposals could improve their terms.

Provisions of our Certificate of Incorporation and By-Laws

Our certificate of incorporation and by-laws include a number of provisions that may have the effect of delaying, deferring or discouraging another party from acquiring control of us and encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our board of directors rather than pursue non-negotiated takeover attempts. These provisions include the items described below.

Board Composition and Filling Vacancies. Our certificate of incorporation provides for the division of our board of directors into three classes serving staggered three-year terms, with one class being elected each year. Our certificate of incorporation also provides that directors may be removed only for cause and then only by the affirmative vote of the holders of 75% or more of the shares then entitled to vote at an election of directors. Furthermore, any vacancy on our board of directors, however occurring, including a vacancy resulting from an increase in the size of our board, may only be filled by the affirmative vote of a majority of our directors then in office even if less than a quorum.

Table of Contents

No Written Consent of Stockholders. Our certificate of incorporation provides that all stockholder actions are required to be taken by a vote of the stockholders at an annual or special meeting, and that stockholders may not take any action by written consent in lieu of a meeting.

Meetings of Stockholders. Our certificate of incorporation and bylaws provide that only a majority of the members of our board of directors then in office may call special meetings of stockholders and only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders. Our bylaws limit the business that may be conducted at an annual meeting of stockholders to those matters properly brought before the meeting.

Advance Notice Requirements. Our bylaws establish advance notice procedures with regard to stockholder proposals relating to the nomination of candidates for election as directors or new business to be brought before meetings of our stockholders. These procedures provide that notice of stockholder proposals must be timely given in writing to our corporate secretary prior to the meeting at which the action is to be taken. Generally, to be timely, notice must be received at our principal executive offices not less than 90 days nor more than 120 days prior to the first anniversary date of the annual meeting for the preceding year. Our bylaws specify the requirements as to form and content of all stockholders' notices.

Amendment to Certificate of Incorporation and Bylaws. As required by the Delaware General Corporation Law, any amendment of our certificate of incorporation must first be approved by a majority of our board of directors, and if required by law or our certificate of incorporation, must thereafter be approved by a majority of the outstanding shares entitled to vote on the amendment and a majority of the outstanding shares of each class entitled to vote thereon as a class, except that the amendment of the provisions relating to stockholder action, board composition, limitation of liability and the amendment of our certificate of incorporation must be approved by not less than 75% of the outstanding shares entitled to vote on the amendment, and not less than 75% of the outstanding shares of each class entitled to vote thereon as a class. Our bylaws may be amended by the affirmative vote of a majority of the directors then in office, subject to any limitations set forth in the bylaws; and may also be amended by the affirmative vote of at least 75% of the outstanding shares entitled to vote on the amendment, or, if our board of directors recommends that the stockholders approve the amendment, by the affirmative vote of the majority of the outstanding shares entitled to vote on the amendment, in each case voting together as a single class.

Delaware Anti-Takeover Law

We are subject to the provisions of Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits a publicly-held Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a three-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. A "business combination" includes, among other things, a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. In general, Section 203 defines an "interested stockholder" as any person or entity who, together with affiliates and associates, owns, or did own within three years prior to the determination of interested stockholder status, 15% or more of the corporation's voting stock. Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions:

before the stockholder became interested, the board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;

Table of Contents

upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances; or

at or after the time the stockholder became interested, the business combination was approved by the board of directors of the corporation and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

Exclusive Jurisdiction of Certain Actions. Our certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (iii) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, our certificate of incorporation or our bylaws, or (iv) any action asserting a claim against us governed by the internal affairs doctrine. Although we believe this provision benefits us by providing increased consistency in the application of Delaware law in the types of lawsuits to which it applies, the provision may have the effect of discouraging lawsuits against our directors and officers. The enforceability of similar exclusive forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that a court could rule that this provision in our certificate of incorporation is inapplicable or unenforceable.

DESCRIPTION OF DEBT SECURITIES

The paragraphs below describe the general terms and provisions of the debt securities we may issue. When we offer to sell a particular series of debt securities, we will describe the specific terms of the securities in a supplement to this prospectus, including any additional covenants or changes to existing covenants relating to such series. The prospectus supplement also will indicate whether the general terms and provisions described in this prospectus apply to a particular series of debt securities. You should read the actual indenture if you do not fully understand a term or the way we use it in this prospectus.

We may offer senior or subordinated debt securities. Each series of debt securities may have different terms. The senior debt securities will be issued under one or more senior indentures, dated as of a date prior to such issuance, between us and the trustee identified in the applicable prospectus supplement, as amended or supplemented from time to time. We will refer to any such indenture throughout this prospectus as the "senior indenture." Any subordinated debt securities will be issued under one or more separate indentures, dated as of a date prior to such issuance, between us and the trustee identified in the applicable prospectus supplement, as amended or supplemented from time to time. We will refer to any such indenture throughout this prospectus as the "subordinated indenture" and to the trustee under the senior or subordinated indenture as the "trustee." The senior indenture and the subordinated indenture are sometimes collectively referred to in this prospectus as the "indentures." The indentures will be subject to and governed by the Trust Indenture Act of 1939, as amended. We included copies of the forms of the indentures as exhibits to our registration statement and they are incorporated into this prospectus by reference.

If we issue debt securities at a discount from their principal amount, then, for purposes of calculating the aggregate initial offering price of the offered securities issued under this prospectus, we will include only the initial offering price of the debt securities and not the principal amount of the debt securities.

Table of Contents

We have summarized below the material provisions of the indentures and the debt securities, or indicated which material provisions will be described in the related prospectus supplement. The prospectus supplement relating to any particular securities offered will describe the specific terms of the securities, which may be in addition to or different from the general terms summarized in this prospectus. Because the summary in this prospectus and in any prospectus supplement does not contain all of the information that you may find useful, you should read the documents relating to the securities that are described in this prospectus or in any applicable prospectus supplement. Please read "Where You Can Find More Information" to find out how you can obtain a copy of those documents. Except as otherwise indicated, the terms of the indentures are identical. As used under this caption, the term "debt securities" includes the debt securities being offered by this prospectus and all other debt securities issued by us under the indentures.

General

The indentures:

do not limit the amount of debt securities that we may issue;

allow us to issue debt securities in one or more series;

do not require us to issue all of the debt securities of a series at the same time;

allow us to reopen a series to issue additional debt securities without the consent of the holders of the debt securities of such series; and

provide that the debt securities will be unsecured, except as may be set forth in the applicable prospectus supplement.

Unless we give you different information in the applicable prospectus supplement, the senior debt securities will be unsubordinated obligations and will rank equally with all of our other unsecured and unsubordinated indebtedness. Payments on the subordinated debt securities will be subordinated to the prior payment in full of all of our senior indebtedness, as described under "Description of Debt Securities Subordination" and in the applicable prospectus supplement.

Each indenture provides that we may, but need not, designate more than one trustee under an indenture. Any trustee under an indenture may resign or be removed and a successor trustee may be appointed to act with respect to the series of debt securities administered by the resigning or removed trustee. If two or more persons are acting as trustee with respect to different series of debt securities, each trustee shall be a trustee of a trust under the applicable indenture separate and apart from the trust administered by any other trustee. Except as otherwise indicated in this prospectus, any action described in this prospectus to be taken by each trustee may be taken by each trustee with respect to, and only with respect to, the one or more series of debt securities for which it is trustee under the applicable indenture.

The prospectus supplement for each offering will provide the following terms, where applicable:

the title of the debt securities and whether they are senior or subordinated;

the aggregate principal amount of the debt securities being offered, the aggregate principal amount of the debt securities outstanding as of the most recent practicable date and any limit on their aggregate principal amount, including the aggregate principal amount of debt securities authorized;

the price at which the debt securities will be issued, expressed as a percentage of the principal and, if other than the principal amount thereof, the portion of the principal amount thereof payable upon declaration of acceleration of the maturity thereof or, if applicable, the portion of

Edgar Filing: FATE THERAPEUTICS INC - Form 424B5

Table of Contents

the principal amount of such debt securities that is convertible into common stock or other securities of ours or the method by which any such portion shall be determined;

if convertible, the terms on which such debt securities are convertible, including the initial conversion price or rate and the conversion period and any applicable limitations on the ownership or transferability of common stock or other securities of ours received on conversion;

the date or dates, or the method for determining the date or dates, on which the principal of the debt securities will be payable;

the fixed or variable interest rate or rates of the debt securities, or the method by which the interest rate or rates is determined;

the date or dates, or the method for determining the date or dates, from which interest will accrue;

the dates on which interest will be payable;

the record dates for interest payment dates, or the method by which such dates will be determine;

the persons to whom interest will be payable;

the basis upon which interest will be calculated if other than that of a 360-day year of twelve 30-day months;

any make-whole amount, which is the amount in addition to principal and interest that is required to be paid to the holder of a debt security as a result of any optional redemption or accelerated payment of such debt security, or the method for determining the make-whole amount;

the place or places where the principal of, and any premium or make-whole amount, and interest on, the debt securities will be payable;

where the debt securities may be surrendered for registration of transfer or conversion or exchange;

where notices or demands to or upon us in respect of the debt securities and the applicable indenture may be served;

the times, prices and other terms and conditions upon which we may redeem the debt securities;

any obligation we have to redeem, repay or purchase the debt securities pursuant to any sinking fund or analogous provision or at the option of holders of the debt securities, and the times and prices at which we must redeem, repay or purchase the debt securities as a result of such obligation;

Edgar Filing: FATE THERAPEUTICS INC - Form 424B5

the currency or currencies in which the debt securities are denominated and payable if other than United States dollars, which may be a foreign currency or units of two or more foreign currencies or a composite currency or currencies and the terms and conditions relating thereto, and the manner of determining the equivalent of such foreign currency in United States dollars;

whether the principal of, and any premium or make-whole amount, or interest on, the debt securities of the series are to be payable, at our election or at the election of a holder, in a currency or currencies other than that in which the debt securities are denominated or stated to be payable, and other related terms and conditions;

Edgar Filing: FATE THERAPEUTICS INC - Form 424B5

Table of Contents

whether the amount of payments of principal of, and any premium or make-whole amount, or interest on, the debt securities may be determined according to an index, formula or other method and how such amounts will be determined;

whether the debt securities will be in registered form, bearer form, or both, and (i) if in registered form, the person to whom any interest shall be payable, if other than the person in whose name the security is registered at the close of business on the regular record date for such interest, or (ii) if in bearer form, the manner in which, or the person to whom, any interest on the security shall be payable if otherwise than upon presentation and surrender upon maturity;

any restrictions applicable to the offer, sale or delivery of securities in bearer form and the terms upon which securities in bearer form of the series may be exchanged for securities in registered form of the series and vice versa, if permitted by applicable laws and regulations;

whether any debt securities of the series are to be issuable initially in temporary global form and whether any debt securities of the series are to be issuable in permanent global form with or without coupons and, if so, whether beneficial owners of interests in any such permanent global security may, or shall be required to, exchange their interests for other debt securities of the series, and the manner in which interest shall be paid;

the identity of the depository for securities in registered form, if such series are to be issuable as a global security;

the date as of which any debt securities in bearer form or in temporary global form shall be dated if other than the original issuance date of the first security of the series to be issued;

the applicability, if any, of the defeasance and covenant defeasance provisions described in this prospectus or in the applicable indenture;

whether and under what circumstances we will pay any additional amounts on the debt securities in respect of any tax, assessment or governmental charge and, if so, whether we will have the option to redeem the debt securities in lieu of making such a payment;

whether and under what circumstances the debt securities being offered are convertible into common stock or other securities of ours, as the case may be, including the conversion price or rate and the manner or calculation thereof;

the circumstances, if any, specified in the applicable prospectus supplement, under which beneficial owners of interests in the global security may obtain definitive debt securities and the manner in which payments on a permanent global debt security will be made if any debt securities are issuable in temporary or permanent global form;

any provisions granting special rights to holders of securities upon the occurrence of such events as specified in the applicable prospectus supplement;

if the debt securities of such series are to be issuable in definitive form only upon receipt of certain certificates or other documents or satisfaction of other conditions, then the form and/or terms of such certificates, documents or conditions;

the name of the applicable trustee and the nature of any material relationship with us or any of our affiliates, and the percentage of debt securities of the class necessary to require the trustee to take action;

any deletions from, modifications of or additions to our events of default or covenants with regard to such debt securities and any change in the right of any trustee or any of the holders to declare the principal amount of any of such debt securities due and payable;

Table of Contents

applicable CUSIP numbers; and

any other terms of such debt securities not inconsistent with the provisions of the applicable indenture.

We may issue debt securities that provide for less than the entire principal amount thereof to be payable upon declaration of acceleration of the maturity of the debt securities. We refer to any such debt securities throughout this prospectus as "original issue discount securities." The applicable prospectus supplement will describe the United States federal income tax consequences and other relevant considerations applicable to original issue discount securities.

We also may issue indexed debt securities. Payments of principal of, and premium and interest on, indexed debt securities are determined with reference to the rate of exchange between the currency or currency unit in which the debt security is denominated and any other currency or currency unit specified by us, to the relationship between two or more currencies or currency units or by other similar methods or formulas specified in the prospectus supplement.

Except as described under " Merger, Consolidation or Sale of Assets" or as may be set forth in any prospectus supplement, the debt securities will not contain any provisions that (i) would limit our ability to incur indebtedness or (ii) would afford holders of debt securities protection in the event of (a) a highly leveraged or similar transaction involving us, or (b) a change of control or reorganization, restructuring, merger or similar transaction involving us that may adversely affect the holders of the debt securities. In the future, we may enter into transactions, such as the sale of all or substantially all of our assets or a merger or consolidation, that may have an adverse effect on our ability to service our indebtedness, including the debt securities, by, among other things, substantially reducing or eliminating our assets.

Our governing instruments do not define the term "substantially all" as it relates to the sale of assets. Additionally, Delaware cases interpreting the term "substantially all" rely upon the facts and circumstances of each particular case. Consequently, to determine whether a sale of "substantially all" of our assets has occurred, a holder of debt securities must review the financial and other information that we have disclosed to the public.

We will provide you with more information in the applicable prospectus supplement regarding any deletions, modifications, or additions to the events of default or covenants that are described below, including any addition of a covenant or other provision providing event risk or similar protection.

Payment

Unless we give you different information in the applicable prospectus supplement, the principal of, and any premium or make-whole amount, and interest on, any series of the debt securities will be payable at the corporate trust office of the trustee. We will provide you with the address of the trustee in the applicable prospectus supplement. We may also pay interest by mailing a check to the address of the person entitled to it as it appears in the applicable register for the debt securities or by wire transfer of funds to that person at an account maintained within the United States.

All monies that we pay to a paying agent or a trustee for the payment of the principal of, and any premium or make-whole amount, or interest on, any debt security will be repaid to us if unclaimed at the end of two years after the obligation underlying payment becomes due and payable. After funds have been returned to us, the holder of the debt security may look only to us for payment, without payment of interest for the period which we hold the funds.

Table of Contents

Denomination, Interest, Registration and Transfer

Unless otherwise described in the applicable prospectus supplement, the debt securities of any series will be issuable in denominations of \$1,000 and integral multiples of \$1,000.

Subject to the limitations imposed upon debt securities that are evidenced by a computerized entry in the records of a depository company rather than by physical delivery of a note, a holder of debt securities of any series may:

exchange them for any authorized denomination of other debt securities of the same series and of a like aggregate principal amount and kind upon surrender of such debt securities at the corporate trust office of the applicable trustee or at the office of any transfer agent that we designate for such purpose; and

surrender them for registration of transfer or exchange at the corporate trust office of the applicable trustee or at the office of any transfer agent that we designate for such purpose.

Every debt security surrendered for registration of transfer or exchange must be duly endorsed or accompanied by a written instrument of transfer satisfactory to the applicable trustee or transfer agent. Payment of a service charge will not be required for any registration of transfer or exchange of any debt securities, but we or the trustee may require payment of a sum sufficient to cover any tax or other governmental charge payable in connection therewith. If in addition to the applicable trustee, the applicable prospectus supplement refers to any transfer agent initially designated by us for any series of debt securities, we may at any time rescind the designation of any such transfer agent or approve a change in the location through which any such transfer agent acts, except that we will be required to maintain a transfer agent in each place of payment for such series. We may at any time designate additional transfer agents for any series of debt securities.

Neither we, nor any trustee, will be required to:

issue, register the transfer of or exchange debt securities of any series during a period beginning at the opening of business 15 days before the day that the notice of redemption of any debt securities selected for redemption is mailed and ending at the close of business on the day of such mailing;

register the transfer of or exchange any debt security, or portion thereof, so selected for redemption, in whole or in part, except the unredeemed portion of any debt security being redeemed in part; or

issue, register the transfer of or exchange any debt security that has been surrendered for repayment at the option of the holder, except the portion, if any, of such debt security not to be so repaid.

Merger, Consolidation or Sale of Assets

The indentures provide that we may, without the consent of the holders of any outstanding debt securities, (i) consolidate with, (ii) sell, lease or convey all or substantially all of our assets to, or (iii) merge with or into, any other entity provided that:

either we are the continuing entity, or the successor entity, if other than us, assumes the obligations (a) to pay the principal of, and any premium or make-whole amount, and interest on, all of the debt securities and (b) to duly perform and observe all of the covenants and conditions contained in each indenture;

after giving effect to the transaction, there is no event of default under the indentures and no event which, after notice or the lapse of time, or both, would become such an event of default, occurs and continues; and

Table of Contents

an officers' certificate and legal opinion covering such conditions are delivered to each applicable trustee.

Covenants

Existence. Except as described under " Merger, Consolidation or Sale of Assets," the indentures require us to do or cause to be done all things necessary to preserve and keep in full force and effect our existence, rights and franchises. However, the indentures do not require us to preserve any right or franchise if we determine that any right or franchise is no longer desirable in the conduct of our business.

Payment of taxes and other claims. The indentures require us to pay, discharge or cause to be paid or discharged, before they become delinquent (i) all taxes, assessments and governmental charges levied or imposed on us, and (ii) all lawful claims for labor, materials and supplies which, if unpaid, might by law become a lien upon our property. However, we will not be required to pay, discharge or cause to be paid or discharged any such tax, assessment, charge or claim whose amount, applicability or validity is being contested in good faith by appropriate proceedings.

Provision of financial information. The indentures require us to (i) within 15 days of each of the respective dates by which we are required to file our annual reports, quarterly reports and other documents with the SEC, file with the trustee copies of the annual report, quarterly report and other documents that we file with the SEC under Section 13 or 15(d) of the Exchange Act, (ii) file with the trustee and the SEC any additional information, documents and reports regarding compliance by us with the conditions and covenants of the indentures, as required, (iii) within 30 days after the filing with the trustee, mail to all holders of debt securities, as their names and addresses appear in the applicable register for such debt securities, without cost to such holders, summaries of any documents and reports required to be filed by us pursuant to (i) and (ii) above, and (iv) supply, promptly upon written request and payment of the reasonable cost of duplication and delivery, copies of such documents to any prospective holder.

Additional covenants. The applicable prospectus supplement will set forth any of our additional covenants relating to any series of debt securities.

Events of Default, Notice and Waiver

Unless the applicable prospectus supplement states otherwise, when we refer to "events of default" as defined in the indentures with respect to any series of debt securities, we mean:

default in the payment of any installment of interest on any debt security of such series continuing for 30 days;

default in the payment of principal of, or any premium or make-whole amount on, any debt security of such series for five business days at its stated maturity;

default in making any sinking fund payment as required for any debt security of such series for five business days;

default in the performance or breach of any covenant or warranty in the debt securities or in the indenture by us continuing for 60 days after written notice as provided in the applicable indenture, but not of a covenant added to the indenture solely for the benefit of a series of debt securities issued thereunder other than such series;

a default under any bond, debenture, note, mortgage, indenture or instrument:

- (i) having an aggregate principal amount of at least \$30,000,000; or

Table of Contents

(ii)

under which there may be issued, secured or evidenced any existing or later created indebtedness for money borrowed by us, if we are directly responsible or liable as obligor or guarantor,

if the default results in the indebtedness becoming or being declared due and payable prior to the date it otherwise would have, without such indebtedness having been discharged, or such acceleration having been rescinded or annulled, within 30 days after notice to the issuing company specifying such default. Such notice shall be given to us by the trustee, or to us and the trustee by the holders of at least 10% in principal amount of the outstanding debt securities of that series. The written notice shall specify such default and require us to cause such indebtedness to be discharged or cause such acceleration to be rescinded or annulled and shall state that such notice is a "Notice of Default" under such indenture;

bankruptcy, insolvency or reorganization, or court appointment of a receiver, liquidator or trustee of us; and

any other event of default provided with respect to a particular series of debt securities.

If an event of default occurs and is continuing with respect to debt securities of any series outstanding, then the applicable trustee or the holders of 25% or more in principal amount of the debt securities of that series will have the right to declare the principal amount of all the debt securities of that series to be due and payable. If the debt securities of that series are original issue discount securities or indexed securities, then the applicable trustee or the holders of 25% or more in principal amount of the debt securities of that series will have the right to declare the portion of the principal amount as may be specified in the terms thereof to be due and payable. However, at any time after such a declaration of acceleration has been made, but before a judgment or decree for payment of the money due has been obtained by the applicable trustee, the holders of at least a majority in principal amount of outstanding debt securities of such series or of all debt securities then outstanding under the applicable indenture may rescind and annul such declaration and its consequences if:

we have deposited with the applicable trustee all required payments of the principal, any premium or make-whole amount, interest and, to the extent permitted by law, interest on overdue installment of interest, plus applicable fees, expenses, disbursements and advances of the applicable trustee; and

all events of default, other than the non-payment of accelerated principal, or a specified portion thereof, and any premium or make-whole amount, have been cured or waived.

The indentures also provide that the holders of at least a majority in principal amount of the outstanding debt securities of any series or of all debt securities then outstanding under the applicable indenture may, on behalf of all holders, waive any past default with respect to such series and its consequences, except a default:

in the payment of the principal, any premium or make-whole amount, or interest;

in respect of a covenant or provision contained in the applicable indenture that cannot be modified or amended without the consent of the holders of the outstanding debt security that is affected by the default; or

in respect of a covenant or provision for the benefit or protection of the trustee, without its express written consent.

The indentures require each trustee to give notice to the holders of debt securities within 90 days of a default unless such default has been cured or waived. However, the trustee may withhold notice if specified persons of such trustee consider such withholding to be in the interest of the holders of debt securities. The trustee may not withhold notice of a default in the payment of principal, any premium

Table of Contents

or interest on any debt security of such series or in the payment of any sinking fund installment in respect of any debt security of such series.

The indentures provide that holders of debt securities of any series may not institute any proceedings, judicial or otherwise, with respect to such indenture or for any remedy under the indenture, unless the trustee fails to act for a period of 60 days after the trustee has received a written request to institute proceedings in respect of an event of default from the holders of 25% or more in principal amount of the outstanding debt securities of such series, as well as an offer of indemnity reasonably satisfactory to the trustee. However, this provision will not prevent any holder of debt securities from instituting suit for the enforcement of payment of the principal of, and any premium or make-whole amount, and interest on, such debt securities at the respective due dates thereof.

The indentures provide that, subject to provisions in each indenture relating to its duties in the case of a default, a trustee has no obligation to exercise any of its rights or powers at the request or direction of any holders of any series of debt securities then outstanding under the indenture, unless the holders have offered to the trustee reasonable security or indemnity. The holders of at least a majority in principal amount of the outstanding debt securities of any series or of all debt securities then outstanding under an indenture shall have the right to direct the time, method and place of conducting any proceeding for any remedy available to the applicable trustee, or of exercising any trust or power conferred upon such trustee. However, a trustee may refuse to follow any direction which:

is in conflict with any law or the applicable indenture;

may involve the trustee in personal liability; or

may be unduly prejudicial to the holders of debt securities of the series not joining the proceeding.

Within 120 days after the close of each fiscal year, we will be required to deliver to each trustee a certificate, signed by one of our several specified officers, stating whether or not that officer has knowledge of any default under the applicable indenture. If the officer has knowledge of any default, the notice must specify the nature and status of the default.

Modification of the Indentures

The indentures provide that modifications and amendments may be made only with the consent of the affected holders of a majority in principal amount of all outstanding debt securities issued under that indenture. However, no such modification or amendment may, without the consent of the holders of the debt securities affected by the modification or amendment:

change the stated maturity of the principal of, or any premium or make-whole amount on, or any installment of principal of or interest on, any such debt security;

reduce the principal amount of, the rate or amount of interest on, or any premium or make-whole amount payable on redemption of, any such debt security;

reduce the amount of principal of an original issue discount security that would be due and payable upon declaration of acceleration of the maturity thereof or would be provable in bankruptcy, or adversely affect any right of repayment of the holder of any such debt security;

change the place of payment or the coin or currency for payment of principal of, or any premium or make-whole amount, or interest on, any such debt security;

impair the right to institute suit for the enforcement of any payment on or with respect to any such debt security;

Table of Contents

reduce the percentage in principal amount of any outstanding debt securities necessary to modify or amend the applicable indenture with respect to such debt securities, to waive compliance with particular provisions thereof or defaults and consequences thereunder or to reduce the quorum or voting requirements set forth in the applicable indenture; or

modify any of the foregoing provisions or any of the provisions relating to the waiver of particular past defaults or covenants, except to increase the required percentage to effect such action or to provide that some of the other provisions may not be modified or waived without the consent of the holder of such debt security.

The holders of a majority in aggregate principal amount of the outstanding debt securities of each series may, on behalf of all holders of debt securities of that series, waive, insofar as that series is concerned, our compliance with material restrictive covenants of the applicable indenture.

We and our respective trustee may make modifications and amendments of an indenture without the consent of any holder of debt securities for any of the following purposes:

to evidence the succession of another person to us as obligor under such indenture;

to add to our covenants for the benefit of the holders of all or any series of debt securities or to surrender any right or power conferred upon us in such indenture;

to add events of default for the benefit of the holders of all or any series of debt securities;

to add or change any provisions of an indenture (i) to change or eliminate restrictions on the payment of principal of, or premium or make-whole amount, or interest on, debt securities in bearer form, or (ii) to permit or facilitate the issuance of debt securities in uncertificated form, provided that such action shall not adversely affect the interests of the holders of the debt securities of any series in any material respect;

to change or eliminate any provisions of an indenture, provided that any such change or elimination shall become effective only when there are no debt securities outstanding of any series created prior thereto which are entitled to the benefit of such provision;

to secure the debt securities;

to establish the form or terms of debt securities of any series;

to provide for the acceptance of appointment by a successor trustee or facilitate the administration of the trusts under an indenture by more than one trustee;

to cure any ambiguity, defect or inconsistency in an indenture, provided that such action shall not adversely affect the interests of holders of debt securities of any series issued under such indenture; and

to supplement any of the provisions of an indenture to the extent necessary to permit or facilitate defeasance and discharge of any series of such debt securities, provided that such action shall not adversely affect the interests of the holders of the outstanding debt securities of any series.

Voting

The indentures provide that in determining whether the holders of the requisite principal amount of outstanding debt securities of a series have given any request, demand, authorization, direction,

Table of Contents

notice, consent or waiver under the indentures or whether a quorum is present at a meeting of holders of debt securities:

the principal amount of an original issue discount security that shall be deemed to be outstanding shall be the amount of the principal thereof that would be due and payable as of the date of such determination upon declaration of acceleration of the maturity thereof;

the principal amount of any debt security denominated in a foreign currency that shall be deemed outstanding shall be the United States dollar equivalent, determined on the issue date for such debt security, of the principal amount or, in the case of an original issue discount security, the United States dollar equivalent on the issue date of such debt security of the amount determined as provided in the preceding bullet point;

the principal amount of an indexed security that shall be deemed outstanding shall be the principal face amount of such indexed security at original issuance, unless otherwise provided for such indexed security under such indenture; and

debt securities owned by us or any other obligor upon the debt securities or by any affiliate of ours or of such other obligor shall be disregarded.

The indentures contain provisions for convening meetings of the holders of debt securities of a series. A meeting will be permitted to be called at any time by the applicable trustee, and also, upon request, by us or the holders of at least 25% in principal amount of the outstanding debt securities of such series, in any such case upon notice given as provided in such indenture. Except for any consent that must be given by the holder of each debt security affected by the modifications and amendments of an indenture described above, any resolution presented at a meeting or adjourned meeting duly reconvened at which a quorum is present may be adopted by the affirmative vote of the holders of a majority of the aggregate principal amount of the outstanding debt securities of that series represented at such meeting.

Notwithstanding the preceding paragraph, except as referred to above, any resolution relating to a request, demand, authorization, direction, notice, consent, waiver or other action that may be made, given or taken by the holders of a specified percentage, which is less than a majority of the aggregate principal amount of the outstanding debt securities of a series, may be adopted at a meeting or adjourned meeting duly reconvened at which a quorum is present by the affirmative vote of such specified percentage.

Any resolution passed or decision taken at any properly held meeting of holders of debt securities of any series will be binding on all holders of such series. The quorum at any meeting called to adopt a resolution, and at any reconvened meeting, will be persons holding or representing a majority in principal amount of the outstanding debt securities of a series. However, if any action is to be taken relating to a consent or waiver which may be given by the holders of at least a specified percentage in principal amount of the outstanding debt securities of a series, the persons holding such percentage will constitute a quorum.

Notwithstanding the foregoing provisions, the indentures provide that if any action is to be taken at a meeting with respect to any request, demand, authorization, direction, notice, consent, waiver or other action that such indenture expressly provides may be made, given or taken by the holders of a specified percentage in principal amount of all outstanding debt securities affected by such action, or of the holders of such series and one or more additional series:

there shall be no minimum quorum requirement for such meeting; and

the principal amount of the outstanding debt securities of such series that vote in favor of such request, demand, authorization, direction, notice, consent, waiver or other action shall be taken

Table of Contents

account in determining whether such request, demand, authorization, direction, notice, consent, waiver or other action has been made, given or taken under such indenture.

Subordination

Unless otherwise provided in the applicable prospectus supplement, subordinated debt securities will be subject to the following subordination provisions.

Upon any distribution to our creditors in a liquidation, dissolution or reorganization, the payment of the principal of and interest on any subordinated debt securities will be subordinated to the extent provided in the applicable indenture in right of payment to the prior payment in full of all senior debt. However, our obligation to make payments of the principal of and interest on such subordinated debt securities otherwise will not be affected. No payment of principal or interest will be permitted to be made on subordinated debt securities at any time if a default on senior debt exists that permits the holders of such senior debt to accelerate its maturity and the default is the subject of judicial proceedings or we receive notice of the default. After all senior debt is paid in full and until the subordinated debt securities are paid in full, holders of subordinated debt securities will be subrogated to the rights of holders of senior debt to the extent that distributions otherwise payable to holders of subordinated debt securities have been applied to the payment of senior debt. The subordinated indenture will not restrict the amount of senior debt or other indebtedness of ours. As a result of these subordination provisions, in the event of a distribution of assets upon insolvency, holders of subordinated debt securities may recover less, ratably, than our general creditors.

The term "senior debt" will be defined in the applicable indenture as the principal of and interest on, or substantially similar payments to be made by us in respect of, other outstanding indebtedness, whether outstanding at the date of execution of the applicable indenture or subsequently incurred, created or assumed. The prospectus supplement may include a description of additional terms implementing the subordination feature.

No restrictions will be included in any indenture relating to subordinated debt securities upon the creation of additional senior debt.

If this prospectus is being delivered in connection with the offering of a series of subordinated debt securities, the accompanying prospectus supplement or the information incorporated in this prospectus by reference will set forth the approximate amount of senior debt outstanding as of the end of our most recent fiscal quarter.

Discharge, Defeasance and Covenant Defeasance

Unless otherwise indicated in the applicable prospectus supplement, the indentures allow us to discharge our obligations to holders of any series of debt securities issued under any indenture when:

either (i) all securities of such series have already been delivered to the applicable trustee for cancellation; or (ii) all securities of such series have not already been delivered to the applicable trustee for cancellation but (a) have become due and payable, (b) will become due and payable within one year, or (c) if redeemable at our option, are to be redeemed within one year, and we have irrevocably deposited with the applicable trustee, in trust, funds in such currency or currencies, currency unit or units or composite currency or currencies in which such debt securities are payable, an amount sufficient to pay the entire indebtedness on such debt securities in respect of principal and any premium or make-whole amount, and interest to the date of such deposit if such debt securities have become due and payable or, if they have not, to the stated maturity or redemption date;

we have paid or caused to be paid all other sums payable; and

Table of Contents

an officers' certificate and an opinion of counsel stating the conditions to discharging the debt securities have been satisfied has been delivered to the trustee.

Unless otherwise indicated in the applicable prospectus supplement, the indentures provide that, upon our irrevocable deposit with the applicable trustee, in trust, of an amount, in such currency or currencies, currency unit or units or composite currency or currencies in which such debt securities are payable at stated maturity, or government obligations, or both, applicable to such debt securities, which through the scheduled payment of principal and interest in accordance with their terms will provide money in an amount sufficient to pay the principal of, and any premium or make-whole amount, and interest on, such debt securities, and any mandatory sinking fund or analogous payments thereon, on the scheduled due dates therefor, the issuing company may elect either:

to defease and be discharged from any and all obligations with respect to such debt securities; or

to be released from its obligations with respect to such debt securities under the applicable indenture or, if provided in the applicable prospectus supplement, its obligations with respect to any other covenant, and any omission to comply with such obligations shall not constitute an event of default with respect to such debt securities.

Notwithstanding the above, we may not elect to defease and be discharged from the obligation to pay any additional amounts upon the occurrence of particular events of tax, assessment or governmental charge with respect to payments on such debt securities and the obligations to register the transfer or exchange of such debt securities, to replace temporary or mutilated, destroyed, lost or stolen debt securities, to maintain an office or agency in respect of such debt securities, or to hold monies for payment in trust.

The indentures only permit us to establish the trust described in the paragraph above if, among other things, we have delivered to the applicable trustee an opinion of counsel to the effect that the holders of such debt securities will not recognize income, gain or loss for United States federal income tax purposes as a result of such defeasance or covenant defeasance and will be subject to United States federal income tax on the same amounts, in the same manner and at the same times as would have been the case if such defeasance or covenant defeasance had not occurred. Such opinion of counsel, in the case of defeasance, will be required to refer to and be based upon a ruling received from or published by the Internal Revenue Service or a change in applicable United States federal income tax law occurring after the date of the indenture. In the event of such defeasance, the holders of such debt securities would be able to look only to such trust fund for payment of principal, any premium or make-whole amount, and interest.

When we use the term "government obligations," we mean securities that are:

direct obligations of the United States or the government that issued the foreign currency in which the debt securities of a particular series are payable, for the payment of which its full faith and credit is pledged; or

obligations of a person controlled or supervised by and acting as an agency or instrumentality of the United States or other government that issued the foreign currency in which the debt securities of such series are payable, the payment of which is unconditionally guaranteed as a full faith and credit obligation by the United States or such other government, which are not callable or redeemable at the option of the issuer thereof and shall also include a depository receipt issued by a bank or trust company as custodian with respect to any such government obligation or a specific payment of interest on or principal of any such government obligation held by such custodian for the account of the holder of a depository receipt. However, except as required by law, such custodian is not authorized to make any deduction from the amount payable to the holder of such depository receipt from any amount received by the custodian in

Table of Contents

respect of the government obligation or the specific payment of interest on or principal of the government obligation evidenced by such depository receipt.

Unless otherwise provided in the applicable prospectus supplement, if after we have deposited funds and/or government obligations to effect defeasance or covenant defeasance with respect to debt securities of any series, (i) the holder of a debt security of such series is entitled to, and does, elect under the terms of the applicable indenture or the terms of such debt security to receive payment in a currency, currency unit or composite currency other than that in which such deposit has been made in respect of such debt security, or (ii) a conversion event occurs in respect of the currency, currency unit or composite currency in which such deposit has been made, the indebtedness represented by such debt security will be deemed to have been, and will be, fully discharged and satisfied through the payment of the principal of, and premium or make-whole amount, and interest on, such debt security as they become due out of the proceeds yielded by converting the amount so deposited in respect of such debt security into the currency, currency unit or composite currency in which such debt security becomes payable as a result of such election or such cessation of usage based on the applicable market exchange rate.

When we use the term "conversion event," we mean the cessation of use of:

a currency, currency unit or composite currency both by the government of the country that issued such currency and for the settlement of transactions by a central bank or other public institutions of or within the international banking community;

the European Currency Unit both within the European Monetary System and for the settlement of transactions by public institutions of or within the European Communities; or

any currency unit or composite currency other than the European Currency Unit for the purposes for which it was established.

Unless otherwise provided in the applicable prospectus supplement, all payments of principal of, and any premium or make-whole amount, and interest on, any debt security that is payable in a foreign currency that ceases to be used by its government of issuance shall be made in United States dollars.

In the event that (i) we effect covenant defeasance with respect to any debt securities and (ii) those debt securities are declared due and payable because of the occurrence of any event of default, the amount in the currency, currency unit or composite currency in which such debt securities are payable, and government obligations on deposit with the applicable trustee, will be sufficient to pay amounts due on such debt securities at the time of their stated maturity but may not be sufficient to pay amounts due on such debt securities at the time of the acceleration resulting from such event of default. However, the issuing company would remain liable to make payments of any amounts due at the time of acceleration.

The applicable prospectus supplement may further describe the provisions, if any, permitting such defeasance or covenant defeasance, including any modifications to the provisions described above, with respect to the debt securities of or within a particular series.

Conversion Rights

The terms and conditions, if any, upon which the debt securities are convertible into common stock or other securities of ours will be set forth in the applicable prospectus supplement. The terms will include whether the debt securities are convertible into shares of common stock or other securities of ours, the conversion price, or manner of calculation thereof, the conversion period, provisions as to whether conversion will be at the issuing company's option or the option of the holders, the events requiring an adjustment of the conversion price and provisions affecting conversion in the event of the redemption of the debt securities and any restrictions on conversion.

Table of Contents

Global Securities

The debt securities of a series may be issued in whole or in part in the form of one or more global securities that will be deposited with, or on behalf of, a depository identified in the applicable prospectus supplement relating to such series. Global securities, if any, issued in the United States are expected to be deposited with The Depository Trust Company, or DTC, as depository. We may issue global securities in either registered or bearer form and in either temporary or permanent form. We will describe the specific terms of the depository arrangement with respect to a series of debt securities in the applicable prospectus supplement relating to such series. We expect that unless the applicable prospectus supplement provides otherwise, the following provisions will apply to depository arrangements.

Once a global security is issued, the depository for such global security or its nominee will credit on its book-entry registration and transfer system the respective principal amounts of the individual debt securities represented by such global security to the accounts of participants that have accounts with such depository. Such accounts shall be designated by the underwriters, dealers or agents with respect to such debt securities or by us if we offer such debt securities directly. Ownership of beneficial interests in such global security will be limited to participants with the depository or persons that may hold interests through those participants.

We expect that, under procedures established by DTC, ownership of beneficial interests in any global security for which DTC is the depository will be shown on, and the transfer of that ownership will be effected only through, records maintained by DTC or its nominee, with respect to beneficial interests of participants with the depository, and records of participants, with respect to beneficial interests of persons who hold through participants with the depository. Neither we nor the trustee will have any responsibility or liability for any aspect of the records of DTC or for maintaining, supervising or reviewing any records of DTC or any of its participants relating to beneficial ownership interests in the debt securities. The laws of some states require that certain purchasers of securities take physical delivery of such securities in definitive form. Such limits and laws may impair the ability to own, pledge or transfer beneficial interest in a global security.

So long as the depository for a global security or its nominee is the registered owner of such global security, such depository or such nominee, as the case may be, will be considered the sole owner or holder of the debt securities represented by the global security for all purposes under the applicable indenture. Except as described below or in the applicable prospectus supplement, owners of beneficial interest in a global security will not be entitled to have any of the individual debt securities represented by such global security registered in their names, will not receive or be entitled to receive physical delivery of any such debt securities in definitive form and will not be considered the owners or holders thereof under the applicable indenture. Beneficial owners of debt securities evidenced by a global security will not be considered the owners or holders thereof under the applicable indenture for any purpose, including with respect to the giving of any direction, instructions or approvals to the trustee under the indenture. Accordingly, each person owning a beneficial interest in a global security with respect to which DTC is the depository must rely on the procedures of DTC and, if such person is not a participant with the depository, on the procedures of the participant through which such person owns its interests, to exercise any rights of a holder under the applicable indenture. We understand that, under existing industry practice, if DTC requests any action of holders or if an owner of a beneficial interest in a global security desires to give or take any action which a holder is entitled to give or take under the applicable indenture, DTC would authorize the participants holding the relevant beneficial interest to give or take such action, and such participants would authorize beneficial owners through such participants to give or take such actions or would otherwise act upon the instructions of beneficial owners holding through them.

Table of Contents

Payments of principal of, and any premium or make-whole amount, and interest on, individual debt securities represented by a global security registered in the name of a depository or its nominee will be made to or at the direction of the depository or its nominee, as the case may be, as the registered owner of the global security under the applicable indenture. Under the terms of the applicable indenture, we and the trustee may treat the persons in whose name debt securities, including a global security, are registered as the owners thereof for the purpose of receiving such payments. Consequently, neither we nor the trustee have or will have any responsibility or liability for the payment of such amounts to beneficial owners of debt securities including principal, any premium or make-whole amount, or interest. We believe, however, that it is currently the policy of DTC to immediately credit the accounts of relevant participants with such payments, in amounts proportionate to their respective holdings of beneficial interests in the relevant global security as shown on the records of DTC or its nominee. We also expect that payments by participants to owners of beneficial interests in such global security held through such participants will be governed by standing instructions and customary practices, as is the case with securities held for the account of customers in bearer form or registered in street name, and will be the responsibility of such participants. Redemption notices with respect to any debt securities represented by a global security will be sent to the depository or its nominee. If less than all of the debt securities of any series are to be redeemed, we expect the depository to determine the amount of the interest of each participant in such debt securities to be redeemed to be determined by lot. Neither we, the trustee, any paying agent nor the security registrar for such debt securities will have any responsibility or liability for any aspect of the records relating to or payments made on account of beneficial ownership interests in the global security for such debt securities or for maintaining any records with respect thereto.

Neither we nor the trustee will be liable for any delay by the holders of a global security or the depository in identifying the beneficial owners of debt securities, and we and the trustee may conclusively rely on, and will be protected in relying on, instructions from the holder of a global security or the depository for all purposes. The rules applicable to DTC and its participants are on file with the SEC.

If a depository for any debt securities is at any time unwilling, unable or ineligible to continue as depository and we do not appoint a successor depository within 90 days, we will issue individual debt securities in exchange for the global security representing such debt securities. In addition, we may at any time and at our sole discretion, subject to any limitations described in the applicable prospectus supplement relating to such debt securities, determine not to have any of such debt securities represented by one or more global securities and in such event will issue individual debt securities in exchange for the global security or securities representing such debt securities. Individual debt securities so issued will be issued in denominations of \$1,000 and integral multiples of \$1,000.

The debt securities of a series may also be issued in whole or in part in the form of one or more bearer global securities that will be deposited with a depository, or with a nominee for such depository, identified in the applicable prospectus supplement. Any such bearer global securities may be issued in temporary or permanent form. The specific terms and procedures, including the specific terms of the depository arrangement, with respect to any portion of a series of debt securities to be represented by one or more bearer global securities will be described in the applicable prospectus supplement.

No Recourse

There is no recourse under any obligation, covenant or agreement in the applicable indenture or with respect to any security against any of our or our successor's past, present or future stockholders, employees, officers or directors.

Table of Contents

DESCRIPTION OF WARRANTS

The following description, together with the additional information we may include in any applicable prospectus supplements, summarizes the material terms and provisions of the warrants that we may offer under this prospectus and the related warrant agreements and warrant certificates. While the terms summarized below will apply generally to any warrants that we may offer, we will describe the particular terms of any series of warrants in more detail in the applicable prospectus supplement. If we indicate in the prospectus supplement, the terms of any warrants offered under that prospectus supplement may differ from the terms described below. Specific warrant agreements will contain additional important terms and provisions and will be incorporated by reference as an exhibit to the registration statement, which includes this prospectus.

General

We may issue warrants for the purchase of common stock, preferred stock and/or debt securities in one or more series. We may issue warrants independently or together with common stock, preferred stock and/or debt securities, and the warrants may be attached to or separate from these securities.

We will evidence each series of warrants by warrant certificates that we will issue under a separate warrant agreement. We will enter into the warrant agreement with a warrant agent. We will indicate the name and address of the warrant agent in the applicable prospectus supplement relating to a particular series of warrants.

We will describe in the applicable prospectus supplement the terms of the series of warrants, including:

the offering price and aggregate number of warrants offered;

the currency for which the warrants may be purchased;

if applicable, the designation and terms of the securities with which the warrants are issued and the number of warrants issued with each such security or each principal amount of such security;

if applicable, the date on and after which the warrants and the related securities will be separately transferable;

in the case of warrants to purchase debt securities, the principal amount of debt securities purchasable upon exercise of one warrant and the price at, and currency in which, this principal amount of debt securities may be purchased upon such exercise;

in the case of warrants to purchase common stock or preferred stock, the number of shares of common stock or preferred stock, as the case may be, purchasable upon the exercise of one warrant and the price at which these shares may be purchased upon such exercise;

the effect of any merger, consolidation, sale or other disposition of our business on the warrant agreement and the warrants;

the terms of any rights to redeem or call the warrants;

any provisions for changes to or adjustments in the exercise price or number of securities issuable upon exercise of the warrants;

the periods during which, and places at which, the warrants are exercisable;

the manner of exercise;

the dates on which the right to exercise the warrants will commence and expire;

the manner in which the warrant agreement and warrants may be modified;

Table of Contents

federal income tax consequences of holding or exercising the warrants;

the terms of the securities issuable upon exercise of the warrants; and

any other specific terms, preferences, rights or limitations of or restrictions on the warrants.

DESCRIPTION OF UNITS

We may issue units comprised of shares of common stock, shares of preferred stock, debt securities and warrants in any combination. We may issue units in such amounts and in as many distinct series as we wish. This section outlines certain provisions of the units that we may issue. If we issue units, they will be issued under one or more unit agreements to be entered into between us and a bank or other financial institution, as unit agent. The information described in this section may not be complete in all respects and is qualified entirely by reference to the unit agreement with respect to the units of any particular series. The specific terms of any series of units offered will be described in the applicable prospectus supplement. If so described in a particular supplement, the specific terms of any series of units may differ from the general description of terms presented below. We urge you to read any prospectus supplement related to any series of units we may offer, as well as the complete unit agreement and unit certificate that contain the terms of the units. If we issue units, forms of unit agreements and unit certificates relating to such units will be incorporated by reference as exhibits to the registration statement, which includes this prospectus.

Each unit that we may issue will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately, at any time or at any time before a specified date. The applicable prospectus supplement may describe:

the designation and terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;

any provisions of the governing unit agreement;

the price or prices at which such units will be issued;

the applicable United States federal income tax considerations relating to the units;

any provisions for the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units; and

any other terms of the units and of the securities comprising the units.

The provisions described in this section, as well as those described under "Description of Capital Stock," "Description of Debt Securities" and "Description of Warrants" will apply to the securities included in each unit, to the extent relevant and as may be updated in any prospectus supplements.

Issuance in Series

We may issue units in such amounts and in as many distinct series as we wish. This section summarizes terms of the units that apply generally to all series. Most of the financial and other specific terms of a particular series of units will be described in the applicable prospectus supplement.

Unit Agreements

We will issue the units under one or more unit agreements to be entered into between us and a bank or other financial institution, as unit agent. We may add, replace or terminate unit agents from

Table of Contents

time to time. We will identify the unit agreement under which each series of units will be issued and the unit agent under that agreement in the applicable prospectus supplement.

The following provisions will generally apply to all unit agreements unless otherwise stated in the applicable prospectus supplement:

Modification without Consent

We and the applicable unit agent may amend any unit or unit agreement without the consent of any holder:

to cure any ambiguity; any provisions of the governing unit agreement that differ from those described below;

to correct or supplement any defective or inconsistent provision; or

to make any other change that we believe is necessary or desirable and will not adversely affect the interests of the affected holders in any material respect.

We do not need any approval to make changes that affect only units to be issued after the changes take effect. We may also make changes that do not adversely affect a particular unit in any material respect, even if they adversely affect other units in a material respect. In those cases, we do not need to obtain the approval of the holder of the unaffected unit; we need only obtain any required approvals from the holders of the affected units.

Modification with Consent

We may not amend any particular unit or a unit agreement with respect to any particular unit unless we obtain the consent of the holder of that unit, if the amendment would:

impair any right of the holder to exercise or enforce any right under a security included in the unit if the terms of that security require the consent of the holder to any changes that would impair the exercise or enforcement of that right; or

reduce the percentage of outstanding units or any series or class the consent of whose holders is required to amend that series or class, or the applicable unit agreement with respect to that series or class, as described below.

Any other change to a particular unit agreement and the units issued under that agreement would require the following approval:

If the change affects only the units of a particular series issued under that agreement, the change must be approved by the holders of a majority of the outstanding units of that series; or

If the change affects the units of more than one series issued under that agreement, it must be approved by the holders of a majority of all outstanding units of all series affected by the change, with the units of all the affected series voting together as one class for this purpose.

These provisions regarding changes with majority approval also apply to changes affecting any securities issued under a unit agreement, as the governing document.

In each case, the required approval must be given by written consent.

Unit Agreements Will Not Be Qualified under Trust Indenture Act

Edgar Filing: FATE THERAPEUTICS INC - Form 424B5

No unit agreement will be qualified as an indenture, and no unit agent will be required to qualify as a trustee, under the Trust Indenture Act. Therefore, holders of units issued under unit agreements will not have the protections of the Trust Indenture Act with respect to their units.

Table of Contents

Mergers and Similar Transactions Permitted; No Restrictive Covenants or Events of Default

The unit agreements will not restrict our ability to merge or consolidate with, or sell our assets to, another corporation or other entity or to engage in any other transactions. If at any time we merge or consolidate with, or sell our assets substantially as an entirety to, another corporation or other entity, the successor entity will succeed to and assume our obligations under the unit agreements. We will then be relieved of any further obligation under these agreements.

The unit agreements will not include any restrictions on our ability to put liens on our assets, nor will they restrict our ability to sell our assets. The unit agreements also will not provide for any events of default or remedies upon the occurrence of any events of default.

Governing Law

The unit agreements and the units will be governed by Delaware law.

Form, Exchange and Transfer

We will issue each unit in global i.e., book-entry form only. Units in book-entry form will be represented by a global security registered in the name of a depository, which will be the holder of all the units represented by the global security. Those who own beneficial interests in a unit will do so through participants in the depository's system, and the rights of these indirect owners will be governed solely by the applicable procedures of the depository and its participants. We will describe book-entry securities, and other terms regarding the issuance and registration of the units in the applicable prospectus supplement.

Each unit and all securities comprising the unit will be issued in the same form.

If we issue any units in registered, non-global form, the following will apply to them.

The units will be issued in the denominations stated in the applicable prospectus supplement. Holders may exchange their units for units of smaller denominations or combined into fewer units of larger denominations, as long as the total amount is not changed.

Holders may exchange or transfer their units at the office of the unit agent. Holders may also replace lost, stolen, destroyed or mutilated units at that office. We may appoint another entity to perform these functions or perform them ourselves.

Holders will not be required to pay a service charge to transfer or exchange their units, but they may be required to pay for any tax or other governmental charge associated with the transfer or exchange. The transfer or exchange, and any replacement, will be made only if our transfer agent is satisfied with the holder's proof of legal ownership. The transfer agent may also require an indemnity before replacing any units.

If we have the right to redeem, accelerate or settle any units before their maturity, and we exercise our right as to less than all those units or other securities, we may block the exchange or transfer of those units during the period beginning 15 days before the day we mail the notice of exercise and ending on the day of that mailing, in order to freeze the list of holders to prepare the mailing. We may also refuse to register transfers of or exchange any unit selected for early settlement, except that we will continue to permit transfers and exchanges of the unsettled portion of any unit being partially settled. We may also block the transfer or exchange of any unit in this manner if the unit includes securities that are or may be selected for early settlement.

Only the depository will be entitled to transfer or exchange a unit in global form, since it will be the sole holder of the unit.

Payments and Notices

In making payments and giving notices with respect to our units, we will follow the procedures as described in the applicable prospectus supplement.

Table of Contents

PLAN OF DISTRIBUTION

We may sell securities:

through underwriters;

through dealers;

through agents;

directly to purchasers; or

through a combination of any of these methods or any other method permitted by law.

In addition, we may issue the securities as a dividend or distribution or in a subscription rights offering to our existing security holders.

We may directly solicit offers to purchase securities, or agents may be designated to solicit such offers. In the prospectus supplement relating to such offering, we will name any agent that could be viewed as an underwriter under the Securities Act and describe any commissions that we must pay to any such agent. Any such agent will be acting on a best efforts basis for the period of its appointment or, if indicated in the applicable prospectus supplement, on a firm commitment basis. This prospectus may be used in connection with any offering of our securities through any of these methods or other methods described in the applicable prospectus supplement.

The distribution of the securities may be effected from time to time in one or more transactions:

at a fixed price, or prices, which may be changed from time to time;

at market prices prevailing at the time of sale;

at prices related to such prevailing market prices; or

at negotiated prices.

Each prospectus supplement will describe the method of distribution of the securities and any applicable restrictions.

The prospectus supplement with respect to the securities of a particular series will describe the terms of the offering of the securities, including the following:

the name of the agent or any underwriters;

the public offering or purchase price;

Edgar Filing: FATE THERAPEUTICS INC - Form 424B5

any discounts and commissions to be allowed or paid to the agent or underwriters;

all other items constituting underwriting compensation;

any discounts and commissions to be allowed or paid to dealers; and

any exchanges on which the securities will be listed.

If any underwriters or agents are used in the sale of the securities in respect of which this prospectus is delivered, we will enter into an underwriting agreement, sales agreement or other agreement with them at the time of sale to them, and we will set forth in the prospectus supplement relating to such offering the names of the underwriters or agents and the terms of the related agreement with them.

In connection with the offering of securities, we may grant to the underwriters an option to purchase additional securities with an additional underwriting commission, as may be set forth in the

Table of Contents

accompanying prospectus supplement. If we grant any such option, the terms of such option will be set forth in the prospectus supplement for such securities.

If a dealer is used in the sale of the securities in respect of which the prospectus is delivered, we will sell such securities to the dealer, as principal. The dealer, who may be deemed to be an "underwriter" as that term is defined in the Securities Act, may then resell such securities to the public at varying prices to be determined by such dealer at the time of resale.

If we offer securities in a subscription rights offering to our existing security holders, we may enter into a standby underwriting agreement with dealers, acting as standby underwriters. We may pay the standby underwriters a commitment fee for the securities they commit to purchase on a standby basis. If we do not enter into a standby underwriting arrangement, we may retain a dealer-manager to manage a subscription rights offering for us.

Agents, underwriters, dealers and other persons may be entitled under agreements which they may enter into with us to indemnification by us against certain civil liabilities, including liabilities under the Securities Act, and may be customers of, engage in transactions with or perform services for us in the ordinary course of business.

If so indicated in the applicable prospectus supplement, we will authorize underwriters or other persons acting as our agents to solicit offers by certain institutions to purchase securities from us pursuant to delayed delivery contracts providing for payment and delivery on the date stated in the prospectus supplement. Each contract will be for an amount not less than, and the aggregate amount of securities sold pursuant to such contracts shall not be less nor more than, the respective amounts stated in the prospectus supplement. Institutions with whom the contracts, when authorized, may be made include commercial and savings banks, insurance companies, pension funds, investment companies, educational and charitable institutions and other institutions, but shall in all cases be subject to our approval. Delayed delivery contracts will not be subject to any conditions except that:

the purchase by an institution of the securities covered under that contract shall not at the time of delivery be prohibited under the laws of the jurisdiction to which that institution is subject; and

if the securities are also being sold to underwriters acting as principals for their own account, the underwriters shall have purchased such securities not sold for delayed delivery. The underwriters and other persons acting as our agents will not have any responsibility in respect of the validity or performance of delayed delivery contracts.

Offered securities may also be offered and sold, if so indicated in the prospectus supplement, in connection with a remarketing upon their purchase, in accordance with a redemption or repayment pursuant to their terms, or otherwise, by one or more remarketing firms, acting as principals for their own accounts or as agents for us. Any remarketing firm will be identified and the terms of its agreement, if any, with us and its compensation will be described in the applicable prospectus supplement. Remarketing firms may be deemed to be underwriters in connection with their remarketing of offered securities.

Certain agents, underwriters and dealers, and their associates and affiliates, may be customers of, have borrowing relationships with, engage in other transactions with, or perform services, including investment banking services, for us or one or more of our respective affiliates in the ordinary course of business.

In order to facilitate the offering of the securities, any underwriters may engage in transactions that stabilize, maintain or otherwise affect the price of the securities or any other securities the prices of which may be used to determine payments on such securities. Specifically, any underwriters may over allot in connection with the offering, creating a short position for their own accounts. In addition,

Table of Contents

to cover overallocments or to stabilize the price of the securities or of any such other securities, the underwriters may bid for, and purchase, the securities or any such other securities in the open market. Finally, in any offering of the securities through a syndicate of underwriters, the underwriting syndicate may reclaim selling concessions allowed to an underwriter or a dealer for distributing the securities in the offering if the syndicate repurchases previously distributed securities in transactions to cover syndicate short positions, in stabilization transactions or otherwise. Any of these activities may stabilize or maintain the market price of the securities above independent market levels. Any such underwriters are not required to engage in these activities and may end any of these activities at any time.

We may engage in at the market offerings into an existing trading market in accordance with Rule 415(a)(4) under the Securities Act. In addition, we may enter into derivative transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement so indicates, in connection with those derivatives, the third parties may sell securities covered by this prospectus and the applicable prospectus supplement, including in short sale transactions. If so, the third party may use securities pledged by us or borrowed from us or others to settle those sales or to close out any related open borrowings of stock, and may use securities received from us in settlement of those derivatives to close out any related open borrowings of stock. The third party in such sale transactions will be an underwriter and, if not identified in this prospectus, will be named in the applicable prospectus supplement (or a post-effective amendment). In addition, we may otherwise loan or pledge securities to a financial institution or other third party that in turn may sell the securities short using this prospectus and an applicable prospectus supplement. Such financial institution or other third party may transfer its economic short position to investors in our securities or in connection with a concurrent offering of other securities.

Under Rule 15c6-1 of the Exchange Act, trades in the secondary market generally are required to settle in three business days, unless the parties to any such trade expressly agree otherwise. The applicable prospectus supplement may provide that the original issue date for your securities may be more than three scheduled business days after the trade date for your securities. Accordingly, in such a case, if you wish to trade securities on any date prior to the third business day before the original issue date for your securities, you will be required, by virtue of the fact that your securities initially are expected to settle in more than three scheduled business days after the trade date for your securities, to make alternative settlement arrangements to prevent a failed settlement.

The securities may be new issues of securities and may have no established trading market. The securities may or may not be listed on a national securities exchange. We can make no assurance as to the liquidity of or the existence of trading markets for any of the securities.

In compliance with the guidelines of the Financial Industry Regulatory Authority, Inc., or FINRA, the aggregate maximum discount, commission or agency fees or other items constituting underwriting compensation to be received by any FINRA member or independent broker-dealer will not exceed 8% of the proceeds from any offering pursuant to this prospectus and any applicable prospectus supplement.

The specific terms of any lock-up provisions in respect of any given offering will be described in the applicable prospectus supplement.

The underwriters, dealers and agents may engage in transactions with us, or perform services for us, in the ordinary course of business for which they receive compensation.

The anticipated date of delivery of offered securities will be set forth in the applicable prospectus supplement relating to each offer.

Table of Contents

LEGAL MATTERS

Certain legal matters in connection with this offering will be passed upon for us by Goodwin Procter LLP, San Francisco, California. Any underwriters will also be advised about the validity of the securities and other legal matters by their own counsel, which will be named in the prospectus supplement.

EXPERTS

The consolidated financial statements of Fate Therapeutics, Inc. appearing in our Annual Report (Form 10-K) for the year ended December 31, 2013 have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their report thereon, included therein, and incorporated herein by reference. Such consolidated financial statements are incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We are subject to the information requirements of the Exchange Act and, in accordance therewith, file annual, quarterly and special reports, proxy statements and other information with the SEC. You may read and copy any document we file at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. You may call the SEC at 1-800-SEC-0330 for further information on the operation of the Public Reference Room. These documents also may be accessed through the SEC's electronic data gathering, analysis and retrieval system, or EDGAR, via electronic means, including the SEC's home page on the Internet (www.sec.gov).

We have the authority to designate and issue more than one class or series of stock having various preferences, conversion and other rights, voting powers, restrictions, limitations as to dividends, qualifications, and terms and conditions of redemption. See "Description of Capital Stock." We will furnish a full statement of the relative rights and preferences of each class or series of our stock which has been so designated and any restrictions on the ownership or transfer of our stock to any stockholder upon request and without charge. Written requests for such copies should be directed to Fate Therapeutics, Inc., 3535 General Atomics Court, Suite 200, San Diego, CA 92121, Attention: Secretary, or by telephone request to (858) 875-1800. Our website is located at www.fatetherapeutics.com. Information contained on our website is not incorporated by reference into this prospectus and, therefore, is not part of this prospectus or any accompanying prospectus supplement.

INCORPORATION BY REFERENCE

The SEC allows us to incorporate by reference the information and reports we file with it, which means that we can disclose important information to you by referring you to these documents. The information incorporated by reference is an important part of this prospectus, and information that we file later with the SEC will automatically update and supersede the information already incorporated by reference. We are incorporating by reference the documents listed below, which we have already filed with the SEC, and any future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including all filings made after the date of the filing of this registration statement and prior to the effectiveness of this registration statement, except as to any portion of any future report or document that is not deemed filed under such provisions, until we sell all of the securities:

Annual Report on Form 10-K for the year ended December 31, 2013;

The information specifically incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2013 from our definitive proxy statement on Schedule 14A

Edgar Filing: FATE THERAPEUTICS INC - Form 424B5

Table of Contents

(other than information furnished rather than filed), which was filed with the SEC on April 25, 2014;

Quarterly Reports on Form 10-Q filed with the SEC for the quarters ended March 31, 2014 and June 30, 2014;

Current Reports on Form 8-K filed with the SEC on January 10, 2014, March 17, 2014 (with respect only to item 5.02), June 11, 2014 and August 5, 2014, respectively; and

The description of our common stock contained in our registration statement on Form 8-A (Registration No. 001-36076) filed with the SEC on September 17, 2013 under Section 12(b) of the Exchange Act, including any amendments or reports filed for the purpose of updating such description.

Upon request, we will provide, without charge, to each person, including any beneficial owner, to whom a copy of this prospectus is delivered, a copy of the documents incorporated by reference into this prospectus but not delivered with the prospectus. You may request a copy of these filings, and any exhibits we have specifically incorporated by reference as an exhibit in this prospectus, at no cost by writing or telephoning us at the following address:

Fate Therapeutics, Inc., 3535 General Atomics Court, Suite 200, San Diego, CA 92121, Attention: Secretary, or by telephone request to (858) 875-1800.

This prospectus is part of a registration statement we filed with the SEC. We have incorporated exhibits into this registration statement. You should read the exhibits carefully for provisions that may be important to you.

You should rely only on the information incorporated by reference or provided in this prospectus or any prospectus supplement. We have not authorized anyone to provide you with different information. We are not making an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus or in the documents incorporated by reference is accurate as of any date other than the date on the front of this prospectus or those documents.

Table of Contents

6,000,000 Shares

Common Stock

PROSPECTUS SUPPLEMENT

May , 2015

Joint Book-Running Managers

Leerink Partners

BMO Capital Markets

Co-Managers

Wedbush PacGrow

H.C. Wainwright & Co.
