

STEMCELLS INC
Form 424B5
October 29, 2009

Table of Contents

The information in this preliminary prospectus supplement and the accompanying prospectus is not complete and may be changed. This preliminary prospectus supplement and the accompanying prospectus are not an offer to sell these securities and are not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

PROSPECTUS SUPPLEMENT
(To Prospectus dated July 18, 2008)

Filed pursuant to Rule 424(b)(5)
Registration No. 333-151891

Subject to Completion
Preliminary Prospectus Supplement dated October 28, 2009
10,000,000 Shares of Common Stock
Warrants to Purchase 4,000,000 Shares of Common Stock

We are offering up to 10,000,000 shares of our common stock and warrants to purchase up to 4,000,000 shares of our common stock in this offering (and the shares of common stock issuable from time to time upon exercise of these warrants). The common stock and warrants will be sold in units, with each unit consisting of one share of common stock and a warrant to purchase 0.40 shares of common stock at an exercise price of \$1.50 per share of common stock. Each unit will be sold at a negotiated price of \$1.25 per unit. The shares of common stock and warrants will be issued separately but can only be purchased together in this offering.

Units will not be issued or certificated. Our common stock is quoted on The Nasdaq Global Market under the symbol STEM. On October 27, 2009, the last reported sales price of our common stock on The Nasdaq Global Market was \$1.42 per share.

Investing in our securities involves a high degree of risk. Before buying any securities, you should read the discussion of material risks of investing in our common stock under the heading Risk factors beginning on page S-3 of this prospectus supplement.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus supplement or the accompanying prospectus. Any representation to the contrary is a criminal offense.

We have retained Chardan Capital Markets, LLC to act as our exclusive placement agent in connection with the arrangement of this transaction. We have agreed to pay the placement agent the placement agent fee set forth in the table below, which assumes that we sell all of the units we are offering. The placement agent is not required to arrange for the sale of any specific number of units or dollar amount but will use best efforts to arrange for the sale of all of the units.

| | Per Unit | Maximum Offering Amount |
|----------------------------------|-----------------|--------------------------------|
| Offering price | \$1.25 | 12,500,000 |
| Placement agent fees | \$0.05 | 500,000 |
| Proceeds, before expenses, to us | \$1.20 | 12,000,000 |

We estimate the total expenses of this offering, excluding the placement agent fees, will be approximately \$100,000. Because there is no minimum offering amount required as a condition to closing in this offering, the actual offering amount, the placement agent fees and net proceeds to us, if any, in this offering may be substantially less than the maximum offering amounts set forth above.

Chardan Capital Markets, LLC

The date of this prospectus supplement is , 2009.

This prospectus supplement is not complete without, and may not be utilized except in connection with, the accompanying prospectus dated July 18, 2008 and any amendments to such prospectus. This prospectus supplement provides supplemental information regarding us, updates certain information contained in the accompanying prospectus and describes the specific terms of this offering. The accompanying prospectus gives more general information, some of which may not apply to this offering. We incorporate important information into this prospectus supplement and the accompanying prospectus by reference. You may obtain the information incorporated by reference into this prospectus supplement and the accompanying prospectus without charge by following the instructions under [Where you can find more information](#). You should carefully read both this prospectus supplement and the accompanying prospectus, as well as the additional information described under [Incorporation of certain documents by reference](#), before deciding to invest in the units. You should rely only on the information contained and incorporated by reference in this prospectus supplement and the accompanying prospectus. We have not, and the placement agent has not, authorized anyone to give you different or additional information. You should not assume that the information included or incorporated by reference in this prospectus supplement and accompanying prospectus is accurate as of any date after the respective dates of the documents containing the information.

TABLE OF CONTENTS

Prospectus supplement

| | |
|---|------|
| Prospectus supplement summary | S-1 |
| Risk factors | S-4 |
| Note regarding forward-looking statements | S-12 |
| Use of proceeds | S-13 |
| Price range of common stock | S-13 |
| Dividend policy | S-13 |
| Dilution | S-14 |
| Description of securities | S-15 |
| Plan of distribution | S-17 |
| Where you can find more information | S-19 |
| Incorporation of certain documents by reference | S-19 |
| Legal matters | S-20 |
| Experts | S-20 |

Prospectus

Summary

Unless the context requires otherwise, the words StemCells, we, company, us and our refer to StemCells, Inc. and directly and indirectly wholly-owned subsidiaries.

Table of Contents

Prospectus supplement summary

This summary highlights selected information appearing elsewhere or incorporated by reference in this prospectus supplement and accompanying prospectus and may not contain all of the information that is important to you. This prospectus supplement and the accompanying prospectus include or incorporate by reference information about the common stock and warrants that we are offering as well as information regarding our business and detailed financial data. You should read this prospectus supplement and the accompanying prospectus in their entirety, including the information incorporated by reference.

BUSINESS OVERVIEW

We are focused on developing and commercializing cell-based technologies. Our research and development (R&D) programs are primarily focused on identifying and developing potential cell-based therapeutics which can either restore or support organ function. In particular, since we relocated our corporate headquarters to California in 1999, our R&D efforts have been directed at refining our methods for identifying, isolating, culturing, and purifying the human neural stem cell and human liver engrafting cells (hLEC) and developing these as potential cell-based therapeutics for the central nervous system (CNS) and the liver, respectively. In our CNS Program, our HuCNS-SC[®] product candidate (purified human neural stem cells) is in clinical development for two indications. In January 2009, we completed a six patient Phase I clinical trial of HuCNS-SC cells in infantile and late infantile neuronal ceroid lipofuscinosis (NCL), two forms of a group of disorders often referred to as Batten disease. The data from this Phase I trial showed that the HuCNS-SC cells were well tolerated, and there was evidence that the donor cells engrafted and survived. In December 2008, the FDA approved our investigational new drug application, or IND, to initiate a Phase I clinical trial of HuCNS-SC cells in a second indication, Pelizaeus-Merzbacher Disease (PMD), a fatal myelination disorder in the brain. In September 2009, we announced that we will soon initiate the PMD trial at University of California-San Francisco Children's Hospital. We expect the PMD trial to begin enrolling patients by the end of 2009 and that the trial will take 12-18 months to complete. In addition, our HuCNS-SC cells are in preclinical development for spinal cord injury and retinal disorders. In our Liver Program, we are in preclinical development with our human liver engrafting cells. For a brief description of our significant therapeutic research and development programs see Overview Research and Development Programs in the Business Section of Part I, Item 1 included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2008. We have also conducted research on several other cell types and in other areas, which could lead to other possible product candidates, process improvements or further research activities.

RECENT DEVELOPMENTS

In October 2009, we announced new preclinical data showing that our human neural stem cells protect cone photoreceptors (cones) in the eye from progressive degeneration and preserve visual function. Cones are light sensing cells that are highly concentrated within the macula of the human eye, and the ability to protect these cells may suggest an approach to treating age-related macular degeneration (AMD), the leading cause of vision loss and blindness in people over the age of 55.

In September 2009, we announced the publication of preclinical data demonstrating for the first time that transplantation of our proprietary, purified human neural stem cells delays the loss of motor function in a mouse model of infantile neuronal ceroid lipofuscinosis (NCL). NCL, commonly referred to as Batten disease, is a fatal neurodegenerative disorder in children.

In September 2009, we announced that we will initiate with the University of California, San Francisco (UCSF) Children's Hospital a Phase I clinical trial to evaluate the therapeutic potential of StemCells' proprietary HuCNS-SC[®] product candidate (purified human neural stem cells) to treat Pelizaeus-Merzbacher Disease (PMD), a myelination disorder that primarily affects infants and young children. In this trial, patients with a fatal form of PMD will be transplanted with our HuCNS-SC cells to evaluate safety and to explore the ability of the cells to myelinate the patients' nerve axons.

In June 2009 and July 2009, we sold a total of 1,830,000 shares of common stock under a sales agreement with Cantor Fitzgerald & Co. These shares were sold at an average price of approximately \$1.80 per share for gross proceeds of approximately \$3,291,000. Under the terms of the agreement, up to \$30,000,000 worth of shares may be sold from time to time under a shelf registration statement and Cantor Fitzgerald & Co. is paid compensation equal to 3.0% of

the gross proceeds of such sales.

As of September 30, 2009, we had cash and cash equivalents of approximately \$32 million.

OUR CORPORATE INFORMATION

We were incorporated in Delaware. Our principal executive offices are located at 3155 Porter Drive, Palo Alto, California 94304, and our telephone number is (650) 475-3100. Our website is located at www.stemcellsinc.com. We have not incorporated by reference

S-1

Table of Contents

into this prospectus supplement or the accompanying prospectus the information in, or that can be accessed through, our website, and you should not consider it to be a part of this prospectus supplement or the accompanying prospectus.

S-2

Table of Contents

The offering

Common stock we are offering 10,000,000 shares

Common stock to be outstanding after this offering 118,349,587 shares

Warrants we are offering Warrants to purchase 4,000,000 shares of common stock will be offered in this offering. The warrants will be exercisable during the period commencing six months after the date of original issuance and ending five years from the date the warrants become exercisable at an exercise price of \$1.50 per share of common stock. This prospectus supplement also relates to the offering of the shares of common stock issuable upon exercise of the warrants.

Use of proceeds We intend to use the net proceeds of this offering for general corporate purposes, including working capital, product development and capital expenditures, as well as acquisitions and other strategic purposes. See Use of proceeds.

Nasdaq Global Market symbol STEM

The number of shares of common stock shown above to be outstanding after this offering is based on the 108,349,587 shares outstanding as of October 27, 2009 and excludes:

- Ø shares of our common stock subject to options outstanding as of June 30, 2009 having a weighted average exercise price of \$ per share;
- Ø shares of our common stock subject to outstanding restricted stock units as of June 30, 2009 having a weighted average grant date fair value of \$;
- Ø shares of our common stock subject to outstanding stock appreciation rights as of June 30, 2009 having a weighted average exercise price of \$;
- Ø shares of our common stock that have been reserved for issuance in connection with future grants under our stock option plans as of June 30, 2009;
- Ø shares of our common stock that have been reserved for issuance upon exercise of outstanding warrants as of June 30, 2009 having a weighted average exercise price of \$ per share; and
- Ø shares of common stock issuable upon the exercise of warrants offered hereby.

Table of Contents

Risk factors

Investing in our common stock and warrants involves a high degree of risk. In addition to the risks related to our business set forth in the accompanying prospectus and the other information included and incorporated by reference in this prospectus supplement and accompanying prospectus, you should carefully consider the risks described below before purchasing our common stock and warrants. If any of the following risks actually occurs, our business, results of operations and financial condition will likely suffer. As a result, the trading price of our common stock may decline, and you might lose part or all of your investment.

Risks Related to our Business

Any adverse development relating to our HuCNS-SC product candidate, such as a significant clinical trial failure, could substantially depress our stock price and prevent us from raising additional capital.

At present our ability to progress as a company is significantly dependent on a single therapeutic product candidate, our HuCNS-SC cells (purified human neural stem cells), and on early stage clinical trials. Any clinical, regulatory or other development that significantly delays or prevents us from completing any of our trials, any material safety issue or adverse side effect to any study participant in any of these trials, or the failure of these trials to show the results expected would likely depress our stock price significantly and could prevent us from raising the substantial additional capital we will need to further develop our cellular technologies. Moreover, any material adverse occurrence in our first clinical trials could substantially impair our ability to initiate clinical trials to test our HuCNS-SC cells in other potential indications. This, in turn, could adversely impact our ability to raise additional capital and pursue our planned research and development efforts in our central nervous system (CNS) and liver therapeutic programs and in our programs to develop non-therapeutic applications for our cell technologies.

We have limited capital resources and we may not obtain the significant additional capital needed to sustain our research and development efforts.

We have limited liquidity and capital resources and must obtain significant additional capital resources in order to sustain our product development efforts, acquire businesses, technologies and intellectual property rights which may be important to our business, continue preclinical and clinical testing of our investigative products, pursue regulatory approvals, acquire capital equipment, laboratory and office facilities, establish production capabilities, maintain and enforce our intellectual property portfolio, and support our general and administrative expenses and other working capital requirements. In addition, we will require additional capital resources to continue to develop and grow our operations related to developing cell-based research tools and any other non-therapeutic applications of our cell technologies. We rely on cash reserves and proceeds from equity and debt offerings, proceeds from the transfer, license, lease, or sale of our intellectual property rights, equipment, facilities, or investments, and government grants and funding from collaborative arrangements, if obtainable, to fund our operations.

We intend to pursue opportunities for additional fundraising in the future through equity or debt financings, licensing of our intellectual property, corporate alliances or combinations, grants or collaborative research arrangements, or any combination of these. However, external financing in the current financial environment may be particularly difficult, and the source, timing and availability of any future fundraising will depend principally upon market conditions, interest rates and, more specifically, on progress in our research, preclinical and clinical development programs and the advancement of our programs to develop non-therapeutic applications of our cell technologies. Funding may not be available when needed at all or on terms acceptable to us. While we actively manage our programs and resources in order to conserve cash between fundraising opportunities, our existing capital resources may not be sufficient to fund our operations beyond the next twelve months. If we exhaust our cash reserves and are unable to realize adequate additional fundraising, we may be unable to meet operating obligations and be required to initiate bankruptcy proceedings or delay, scale back or eliminate some or all of our research and product development programs.

Our product development programs are based on novel technologies and are inherently risky.

We are subject to the risks of failure inherent in the development of products based on new technologies. The novel nature of these therapies creates significant challenges in regard to product development and optimization, manufacturing, government regulation, third party reimbursement, and market acceptance. For example, the pathway to regulatory approval for cell-based therapies, including our product candidates, may be more complex and lengthy

than the pathway for conventional drugs. Our programs to develop cell-based research tools are also focused on cell technologies and products supporting cellular research, all of which are novel to some degree. Like biological products in general, stem cell technologies, including non-therapeutic applications, are challenging to manufacture and control. These challenges may prevent us from developing and commercializing products on a timely or profitable basis or at all.

S-4

Table of Contents

Our technology is at an early stage of discovery and development, and we may fail to develop any commercially acceptable or profitable products.

We have incurred significant operating losses and negative cash flows since inception. We have not achieved profitability and may not be able to realize sufficient revenue to achieve or sustain profitability in the future. We have yet to develop any products that have been approved for marketing, and we do not expect to become profitable within the next several years, but rather expect to incur additional and increasing operating losses. Before commercializing any medical product, we will need to obtain regulatory approval from the FDA or from equivalent foreign agencies after conducting extensive preclinical studies and clinical trials that demonstrate that the product candidate is safe and effective. Except for the NCL trial we completed at Oregon Health & Science University (OHSU), we have had no experience conducting human clinical trials. We expect that none of our cell-based therapeutic product candidates will be commercially available for several years, if at all.

While the FDA has approved our IND to initiate a Phase I clinical trial for PMD, there can be no assurance that this clinical trial will be initiated, be completed or result in a successful outcome.

There can be no assurance that our Phase I clinical trial of our proprietary HuCNS-SC product candidate in NCL will result in a successful outcome. We may elect to delay or discontinue other studies or clinical trials based on unfavorable results. Any product developed from, or based on, cellular technologies may fail to:

survive and persist in the desired location;

provide the intended therapeutic benefit;

engraft into existing tissue in the desired manner; or

achieve therapeutic benefits equal to, or better than, the standard of treatment at the time of testing.

In addition, our planned therapeutic products may cause unanticipated or undesirable side effects. Results of preclinical research in animals may not be indicative of future clinical results in humans.

Ultimately if regulatory authorities do not approve our products or if we fail to maintain regulatory compliance, we would be unable to commercialize our therapeutic products, and our business and results of operations would be harmed. Even if we do succeed in developing products, we will face many potential obstacles such as the need to develop or obtain manufacturing, marketing and distribution capabilities. Furthermore, because transplantation of cells is a new form of therapy, the marketplace may not accept any products we may develop.

Moreover, because our cell-based therapeutic products will be derived from tissue of individuals other than the patient (that is, they will be non-self or allogeneic transplant products), patients will likely require the use of immunosuppressive drugs. While immunosuppression is now standard in connection with allogeneic transplants of various kinds, such as heart or liver transplants, long-term maintenance on immunosuppressive drugs can result in complications such as infection, cancer, cardiovascular disease, and renal dysfunction. An immunosuppression regimen was used with our therapeutic product candidate in our Phase I clinical trial for NCL, and is included in the proposed trial protocol for our planned PMD trial.

As for our cell-based research tools, our products are still largely under development or newly marketed. Sales of SC Proven media by our subsidiaries of Stem Cell Sciences Plc (SCS) have been limited, and there can be no assurance that these sales will increase. Competitive products exist and market acceptance of our products is uncertain.

Our success will depend in large part on our ability to develop and commercialize products that treat diseases other than neuronal ceroid lipofuscinosis (Batten disease) and Pelizeaus-Merzbacher Disease (PMD).

Although we have initially focused on evaluating our neural stem cell product for the treatment of infantile and late infantile NCL (Batten disease) and for Pelizeaus-Merzbacher Disease, these diseases are rare and the markets for treating these diseases are small. Accordingly, even if we obtain marketing approval for our HuCNS-SC product candidate for infantile and late infantile NCL or for PMD, in order to achieve profitability, we will likely need to obtain approval to treat additional diseases that present more significant market opportunities.

Acquisitions of companies, businesses or technologies may substantially dilute our stockholders and increase our operating losses.

We may make acquisitions of businesses, technologies or intellectual property rights or otherwise modify our business model in ways we believe to be necessary, useful or complementary to our current product development efforts and cell-based therapeutics business. For example, on April 1, 2009 we acquired the operating assets and liabilities of SCS. Any such acquisition or change in business activities may require assimilation of the operations, products or product candidates and personnel of the acquired business and the training and integration of its employees, and could substantially increase our operating costs, without any offsetting increase in revenue. Acquisitions may not provide the intended technological, scientific or business benefits and could disrupt our operations

S-5

Table of Contents

and divert our limited resources and management's attention from our current operations, which could harm our existing product development efforts. We would likely issue equity securities to pay for any other future acquisitions. The issuance of equity securities for an acquisition could be substantially dilutive to our stockholders. In addition, our results of operations may suffer because of acquisition-related costs or the post-acquisition costs of funding the development of an acquired technology or product candidates or operation of the acquired business, or due to amortization or impairment costs for acquired goodwill and other intangible assets. Any investment made in, or funds advanced to, a potential acquisition target could also significantly adversely affect our results of operation and could further reduce our limited capital resources. Any acquisition or action taken in anticipation of a potential acquisition or other change in business activities could substantially depress the price of our stock.

Costs and disruptions from the integration and management of the acquired SCS business may impair our business.

On April 1, 2009, we acquired the operating assets and liabilities of SCS, including its former subsidiaries in England and Australia. To realize the anticipated benefits of this acquisition, we must successfully combine and integrate the separate organizations and operations of the two companies. The combination of two independent companies is frequently a complex, costly and time-consuming process. Therefore we expect to devote a significant amount of our management's time and attention to integrating the operations of the two companies. We may have difficulty maintaining employee morale and retaining key employees, consultants and collaborators as we take steps to integrate the cultures of the two organizations. We may also encounter incompatible methods, practices or policies or unanticipated difficulties integrating information technology, communications and other systems used by the two companies. Managing the integration of the acquired SCS business into our consolidated operations may also entail numerous operational, legal and financial risks and uncertainties, including:

incurrence or assumption of material liabilities, including unanticipated ones;

assumption of pre-existing contractual obligations and obligations owed by the acquired SCS business to customers and research collaborators, which may not be profitable to our business or deemed consistent with our development plans;

diversion of resources and management attention from our existing businesses and technologies;

inability to retain key employees of any acquired businesses or hire enough qualified personnel to staff any new or expanded operations;

impairment or loss of relationships with key customers or collaborators; and

exposure to new and unanticipated federal, state, local, and foreign legal requirements, which may impact our research and development programs on a consolidated basis.

Our failure to address these risks and uncertainties successfully in the future could harm our business and prevent our achievement of anticipated growth, which could have an adverse effect on our financial condition and results of operations.

We have payment obligations resulting from real property owned or leased by us in Rhode Island, which diverts funding from our research and development activities.

Prior to our reorganization in 1999 and the consolidation of our business in California, we carried out our former encapsulated cell therapy programs in Lincoln, Rhode Island, where we also had our administrative offices. Although we have vacated the Rhode Island facilities, we remain obligated to make lease payments and payments for operating costs for our former science and administrative facility, which we have leased through June 30, 2013. These costs, before sub-tenant rental income, amounted to approximately \$1,825,000 in 2008; our rent payments will increase over the term of the lease, and our operating costs may increase as well. In addition to these costs of our former science and administrative facility, we are obligated to make debt service payments and payments for operating costs of approximately \$440,000 per year for our former encapsulated cell therapy pilot manufacturing facility, which we own.

We have currently subleased a portion of the science and administrative facility, and we are seeking to sublease the remaining portion, but we cannot be sure that we will be able to keep any part of the facility subleased for the duration of our obligation. We are currently seeking to sublease the pilot manufacturing facility, but may not be able to sublease or sell the facility in the future. These continuing costs significantly reduce our cash resources and adversely affect our ability to fund further development of our cellular technologies. In addition, changes in real estate market conditions and assumptions regarding the length of time it may take us to either fully sublease, assign or sell our remaining interest in the our former research facility in Rhode Island may have a significant impact on and cause large variations in our quarter to quarter results of operations. In 1999, in connection with exiting our former research facility in Rhode Island, we created a reserve for the estimated lease payments and operating expenses related to it. The reserve is periodically re-evaluated and adjusted based on assumptions relevant to real estate market conditions and the estimated time until we can either, fully sublease, assign or sell our remaining interests in the property. At March 31, 2009 , the reserve was

S-6

Table of Contents

\$5,337,000. For the year 2008, we incurred \$1,293,000 in operating expenses net of sub-tenant income for this facility. Expenses for this facility will fluctuate based on changes in tenant occupancy rates and other operating expenses related to the lease. Even though it is our intent to sublease, assign, sell, or otherwise divest ourselves of our interests in the facility at the earliest possible time, we cannot determine with certainty a fixed date by which such events will occur. In light of this uncertainty, based on estimates, we will periodically re-evaluate and adjust the reserve, as necessary, and we may make significant adverse adjustments to the reserve in the future.

We may be unable to obtain partners to support our cell-based product development efforts when needed to commercialize our technologies.

Equity and debt financings alone may not be sufficient to fund the cost of developing our cellular technologies, and we may need to rely on partnering or other arrangements to provide financial support for our cell-based discovery and development efforts. In addition, in order to successfully develop and commercialize our technologies, we may need to enter into various arrangements with corporate sponsors, pharmaceutical companies, universities, research groups, and others. While we have engaged, and expect to continue to engage, in discussions regarding such arrangements, we have not reached any agreement, and we may fail to obtain any such agreement on terms acceptable to us. Even if we enter into such arrangements, we may not be able to satisfy our obligations under them or renew or replace them after their original terms expire. Furthermore, these arrangements may require us to grant rights to third parties, such as exclusive marketing rights to one or more products, may require us to issue securities to our collaborators and may contain other terms that are burdensome to us or result in a decrease in our stock price.

If we are unable to protect our patents and proprietary rights, our business, financial condition and results of operations may be materially harmed.

We either own or exclusively license a number of patents and pending patent applications related to various stem and progenitor cells, including human neural stem cell cultures, as well as methods of deriving and using them. The process of obtaining patent protection for products such as those we propose to develop is highly uncertain and involves complex and continually evolving factual and legal questions. The governmental authorities that consider patent applications can deny or significantly reduce the patent coverage requested in an application either before or after issuing the patent. For example, under the procedures of the European Patent Office, third parties may oppose our issued European patents during the relevant opposition period. These proceedings and oppositions could result in substantial uncertainties and cost for us, even if the eventual outcome is favorable to us, and the outcome might not be favorable to us. In the United States, third parties may seek to invalidate or render unenforceable issued patents through a U.S. PTO reexamination process or through the courts; currently two of our patents are the subject of a reexamination proceeding and six of our patents are the subject of litigation. In addition, changes to the laws protecting intellectual property rights could adversely impact the perceived or actual value of our Company. Consequently, we do not know whether any of our pending applications will result in the issuance of patents, whether any of our issued patents will be invalidated or restricted, whether any existing or future patents will provide sufficient protection or significant commercial advantage, or whether others will circumvent these patents, whether or not lawfully. In addition, our patents may not afford us adequate protection from competing products. Moreover, because patents issue for a limited term, our patents may expire before we can commercialize a product covered by the issued patent claims or before we can utilize the patents profitably. Some of our most important patents begin to expire in 2015.

If we learn of third parties who infringe our patent rights, we may decide to initiate legal proceedings to enforce these rights. Patent litigation, including the pending litigation to which we are a party, is inherently unpredictable and highly risky and may result in unanticipated challenges to the validity or enforceability of our intellectual property, antitrust claims or other claims against us, which could result in the loss of these intellectual property rights. Litigation proceedings can be very time-consuming for management and are also very costly and the parties we bring actions against may have significantly greater financial resources than our own. We may not prevail in these proceedings and if we do not prevail we could be liable for damages as well as the costs and attorney fees of our opponents.

Proprietary trade secrets and unpatented know-how are also important to our research and development activities. We cannot be certain that others will not independently develop the same or similar technologies on their own or gain access to our trade secrets or disclose such technology or that we will be able to meaningfully protect our trade secrets

and unpatented know-how. We require our employees, consultants and significant scientific collaborators and sponsored researchers to execute confidentiality agreements upon the commencement of an employment or consulting relationship with us. These agreements may, however, fail to provide meaningful protection or adequate remedies for us in the event of unauthorized use, transfer or disclosure of such information or technology.

If we are unable to obtain necessary licenses to third-party patents and other rights, we may not be able to commercially develop our expected products.

A number of pharmaceutical, biotechnology and other companies, universities and research institutions have filed patent applications or have received patents relating to cell therapy, stem and progenitor cells and other technologies potentially relevant to,

S-7

Table of Contents

or necessary for, both our expected products and for the commercialization of cell-based research tools. We cannot predict which, if any, of these applications will issue as patents or how many of these issued patents will be found valid and enforceable. There may also be existing issued patents which we are currently unaware of which would be infringed by the commercialization of one or more of our product candidates. If so, we may be prevented from commercializing these products unless the third party is willing to grant a license to us. We may be unable to obtain licenses to the relevant patents at a reasonable cost, if at all, and may also be unable to develop or obtain alternative non-infringing technology. If we are unable to obtain such licenses or develop non-infringing technology at a reasonable cost, our business could be significantly harmed. Also, any infringement lawsuits commenced against us may result in significant costs, divert our management's attention and result in an award against us for substantial damages, or potentially prevent us from continuing certain operations.

We are aware of intellectual property rights held by third parties that relate to products or technologies we are developing. For example, some aspects of our cell-based therapeutic product candidates involve the use of growth factors, antibodies and other reagents that may, in certain cases, be the subject of third party rights. In addition, some of our non-therapeutic applications include the use of embryonic stem cell and iPS technologies, which may be the subject of other third party rights. Before we commercialize any product using these growth factors, cells, antibodies or reagents, we may need to obtain license rights from third parties or use alternative growth factors, cells, antibodies and reagents that are not then the subject of third party patent rights. We believe that the commercialization of our products as currently planned will not infringe these third party rights, or, alternatively, that we will be able to obtain necessary licenses or otherwise use alternative non-infringing technology. However, third parties may nonetheless bring suit against us claiming infringement. If we are unable to prove that our technology does not infringe their patents, or if we are unable to obtain necessary licenses or otherwise use alternative non-infringing technology, we may not be able to commercialize any products.

We have obtained rights from companies, universities and research institutions to technologies, processes and compounds that we believe may be important to the development of our products. These licensors, however, may cancel our licenses or convert them to non-exclusive licenses if we fail to use the relevant technology or otherwise breach these agreements. Loss of these licenses could expose us to the risk that our technology infringes the rights of third parties. We can give no assurance that any of these licenses will provide effective protection against our competitors.

We compete with companies that have significant advantages over us.

The market for therapeutic products to treat diseases of, or injuries to, the central nervous system (CNS) is large and competition is intense. The majority of the products currently on the market or in development are small molecule pharmaceutical compounds, and many pharmaceutical companies have made significant commitments to the CNS field. We believe cellular therapies, if proven safe and effective, will have unique properties that will make them desirable over small molecule drugs, none of which currently replace damaged tissue. However, any cell-based therapeutic to treat diseases of, or injuries to, the CNS is likely to face intense competition from the small molecule sector, biologics, as well as medical devices. We expect to compete with a host of companies, some of which are privately owned and some of which have resources far greater than ours.

In the liver field, there are no broad-based therapies for the treatment of liver disease at present. The primary therapy is liver transplantation, which is limited by the availability of matched donor organs. Liver-assist devices, when and if they become available, could also be used to help patients while they await suitably matched organs for transplantation. Liver transplantation may remain the standard of care even if we successfully develop a cellular therapy. In addition, new therapies may become available before we successfully develop a cell-based therapy for liver disease.

In the cell-based tools market, there are a number of companies already supplying cells, media, reagents, and other research tools to both for-profit and non-profit researchers. Many of these suppliers have far greater resources than we do, including greater manufacturing capacity and experience, substantial capital resources, a dedicated sales and marketing force, and well established sales channels and customer relationships. If we are unable to develop a unique or competitive product offering, we may not be able to generate sufficient revenues to offset the costs of developing these non-therapeutic applications for our technologies.

Development of our technologies is subject to, and restricted by, extensive government regulation, which could impede our business.

Our research and development efforts, as well as any ongoing or future clinical trials, and the manufacturing and marketing of any products we may develop, will be subject to, and restricted by, extensive regulation by governmental authorities in the United States and other countries. The process of obtaining FDA and other necessary regulatory approvals is lengthy, expensive and uncertain. FDA and other legal and regulatory requirements applicable to the development and manufacture of the cells and cell lines required for our preclinical and clinical products could substantially delay or prevent us from producing the cells needed to initiate additional clinical trials. We or our collaborators may fail to obtain the necessary approvals to commence or continue clinical testing or to manufacture or market our potential products in reasonable time frames, if at all. In addition, the U.S. Congress and other legislative bodies may enact regulatory reforms or restrictions on the development of new therapies that could adversely affect the regulatory environment in which we operate or the development of any products we may develop.

S-8

Table of Contents

We base our research and development on the use of human stem and progenitor cells obtained from human tissue, including fetal tissue. The U.S. federal and state governments and other jurisdictions impose restrictions on the acquisition and use of fetal tissue, including those incorporated in federal Good Tissue Practice, or GTP, regulations. These regulatory and other constraints could prevent us from obtaining cells and other components of our products in the quantity or quality needed for their development or commercialization, including the commercialization of certain cell-based research tools. These restrictions change from time to time and may become more onerous. Additionally, we may not be able to identify or develop reliable sources for the cells necessary for our potential products that is, sources that follow all state and federal laws and guidelines for cell procurement. Certain components used to manufacture our stem and progenitor cell-based therapeutic product candidates will need to be manufactured in compliance with the FDA's Good Manufacturing Practices, or GMP. Accordingly, at least for our therapeutic programs, we will need to enter into supply agreements with companies that manufacture these components to GMP standards.

Noncompliance with applicable requirements both before and after approval, if any, can subject us, our third party suppliers and manufacturers, and our other collaborators to administrative and judicial sanctions, such as, among other things, warning letters, fines and other monetary payments, recall or seizure of products, criminal proceedings, suspension or withdrawal of regulatory approvals, interruption or cessation of clinical trials, total or partial suspension of production or distribution, injunctions, limitations on or the elimination of claims we can make for our products, and refusal of the government to enter into supply contracts or fund research, or delay in approving or refusal to approve new drug applications.

We are dependent on the services of key personnel.

We are highly dependent on the principal members of our management and scientific staff and some of our outside consultants, including the members of our scientific advisory board, our chief executive officer, our vice presidents, and the heads of key departments or functions within the company. Although we have entered into employment agreements with some of these individuals, they may terminate their agreements at any time. In addition, our operations are dependent upon our ability to attract and retain additional qualified scientific and management personnel. We may not be able to attract and retain the personnel we need on acceptable terms given the competition for experienced personnel among pharmaceutical, biotechnology and health care companies, universities and research institutions.

Our activities involve hazardous materials and experimental animal testing; improper handling of these animals and materials by our employees or agents could expose us to significant legal and financial penalties.

Our research and development activities involve the controlled use of test animals as well as hazardous chemicals and potentially hazardous biological materials such as human tissue. Their use subjects us to environmental and safety laws and regulations such as those governing laboratory procedures, exposure to blood-borne pathogens, use of laboratory animals, and the handling of biohazardous materials. Compliance with current or future laws and regulations may be expensive and the cost of compliance could adversely affect us.

Although we believe that our safety procedures for using, handling, storing, and disposing of hazardous and potentially hazardous materials comply with the standards prescribed by applicable federal, state and local regulations, the risk of accidental contamination or injury from these materials cannot be eliminated. In the event of such an accident or of any violation of these or future laws and regulations, the applicable federal, state, or local authorities could curtail our use of these materials; we could be liable for any civil damages that result, the cost of which could be substantial; and we could be subjected to substantial fines or penalties. In addition, any failure by us to control the use, disposal, removal, or storage, or to adequately restrict the discharge, or to assist in the cleanup, of hazardous chemicals or hazardous, infectious or toxic substances could subject us to significant liability. Any such liability could exceed our resources and could have a material adverse effect on our business, financial condition and results of operations. Moreover, an accident could damage our research and manufacturing facilities and operations and result in serious adverse effects on our business.

The development, manufacturing and commercialization of cell-based therapeutic products expose us to product liability claims, which could lead to substantial liability.

By developing and, ultimately, commercializing medical products, we are exposed to the risk of product liability claims. Product liability claims against us could result in substantial litigation costs and damage awards against us. We have obtained liability insurance that covers our clinical trials, and we will need to increase our insurance coverage if and when we begin commercializing products. We may not be able to obtain insurance on acceptable terms, if at all, and the policy limits on our insurance policies may be insufficient to cover our liability.

The manufacture of cell-based products is novel, highly regulated, critical to our business, and dependent upon specialized key materials.

S-9

Table of Contents

The proliferation and manufacture of cell-based products are complicated and difficult processes, dependent upon substantial know-how and subject to the need for continual process improvements to be competitive. Our manufacturing experience is limited and the technologies are comparatively new. In addition, our ability to scale-up manufacturing to satisfy the various requirements of our planned clinical trials, such as GTP, GMP and release testing requirements, is unproven and uncertain. Manufacturing disruptions may occur and despite efforts to regulate and control all aspects of manufacturing, the potential for human or system failure remains. Manufacturing irregularities or lapses in quality control could have a serious adverse effect on our reputation and business, which could cause a significant loss of stockholder value. Many of the materials that we use to prepare our cell-based products are highly specialized, complex and available from only a limited number of suppliers or derived from a biological origin. At present, some of our material requirements are single sourced, and the loss of one or more of these sources may adversely affect our business if we are unable to obtain alternatives or alternative sources at all or upon terms that are acceptable to us.

Because health care insurers and other organizations may not pay for our products or may impose limits on reimbursements, our ability to become profitable could be adversely affected.

In both domestic and foreign markets, sales of potential therapeutic products are likely to depend in part upon the availability and amounts of reimbursement from third-party health care payor organizations, including government agencies, private health care insurers and other health care payors, such as health maintenance organizations and self-insured employee plans. There is considerable pressure to reduce the cost of therapeutic products. Government and other third party payors are increasingly attempting to contain health care costs by limiting both coverage and the level of reimbursement for new therapeutic products and by refusing, in some cases, to provide any coverage for uses of approved products for disease indications for which the FDA or other relevant authority has not granted marketing approval. Moreover, in some cases, government and other third party payors have refused to provide reimbursement for uses of approved products for disease indications for which the FDA or other relevant authority has granted marketing approval. Significant uncertainty exists as to the reimbursement status of newly approved health care products or novel therapies such as ours. Even if we obtain regulatory approval to market our products, we can give no assurance that reimbursement will be provided by such payors at all or without substantial delay or, if such reimbursement is provided, that the approved reimbursement amounts will be sufficient to enable us to sell products we develop on a profitable basis. Changes in reimbursement policies could also adversely affect the willingness of pharmaceutical companies to collaborate with us on the development of our cellular technologies. In certain foreign markets, pricing or profitability of prescription pharmaceuticals is subject to government control. We also expect that there will continue to be a number of federal and state proposals to implement government control over health care costs. Efforts to change regulatory and reimbursement standards are likely to continue in future legislative sessions. We do not know what legislative proposals federal or state governments will adopt or what actions federal, state or private payors for health care goods and services may take in response to such proposals or legislation. We cannot predict the effect of government control and health care reimbursement practices on our business.

Ethical and other concerns surrounding the use of stem or progenitor-based cell therapy may negatively affect regulatory approval or public perception of our product candidates, which could reduce demand for our products or depress our stock price.

The use of stem cells for research and therapy has been the subject of debate regarding related ethical, legal and social issues. Although these concerns have mainly been directed to the use of embryonic stem cells, which we presently are not developing as potential therapeutic product candidates, the distinction between embryonic and non-embryonic stem cells is frequently overlooked. Moreover, our use of human stem or progenitor cells from fetal sources might raise these or similar concerns. Negative public attitudes toward stem cell therapy could result in greater governmental regulation of stem cell therapies, which could harm our business. For example, concerns regarding such possible regulation could impact our ability to attract collaborators and investors. Also, existing regulatory constraints on the use of embryonic stem cells may in the future be extended to use of fetal stem cells, and these constraints might prohibit or restrict us from conducting research or from commercializing products. Existing and potential U.S. government regulation of embryonic tissue may lead researchers to leave the field of stem cell research or the country altogether, in order to assure that their careers will not be impeded by restrictions on their

work. Similarly, these factors may induce graduate students to choose other fields less vulnerable to changes in regulatory oversight, thus exacerbating the risk that we may not be able to attract and retain the scientific personnel we need in face of the competition among pharmaceutical, biotechnology and health care companies, universities and research institutions for what may become a shrinking class of qualified individuals.

Restrictions on the use of human embryonic stem cells, including public and political opposition to the use of these cells, could harm our business.

Some of our research includes testing cells derived from embryonic tissue. While we are not developing human embryonic stem cells as potential therapeutic products, legal restrictions on the use of human embryonic stem cells could impede our ability to develop worthwhile non-therapeutic products for research. In addition, the use of these cells could give rise to ethical and social commentary adverse to us, which could harm the market price of our common stock. Additional government-imposed restrictions on

S-10

Table of Contents

the use of embryos or human embryonic stem cells in research and development could also cause an adverse effect on us by harming our ability to establish important partnerships or collaborations, delaying or preventing the development of certain non-therapeutic products, and causing a decrease in the price of our stock or by otherwise making it more difficult for us to raise additional capital. These risks could have unanticipated adverse consequences on our business, including on both our therapeutic and non-therapeutic programs.

Our corporate documents and Delaware law contain provisions that could make it difficult for us to be acquired in a transaction that might be beneficial to our stockholders.

Our board of directors has the authority to issue shares of preferred stock and to fix the rights, preferences, privileges, and restrictions of these shares without stockholder approval. These provisions in our corporate documents, along with certain provisions under Delaware law, may make it more difficult for a third party to acquire us or discourage a third party from attempting to acquire us, even if the acquisition might be beneficial to our stockholders.

Risks Related to the Securities Market

Our stock price has been, and will likely continue to be, highly volatile, which may negatively affect our ability to obtain additional financing in the future.

The market price per share of our common stock has been and is likely to continue to be highly volatile due to the risks and uncertainties described in this section of this prospectus supplement, as well as other factors, including:

our ability to develop and test our technologies;

our ability to patent or obtain licenses to necessary technologies;

conditions and publicity regarding the industry in which we operate, as well as the specific areas our product candidates seek to address;

competition in our industry;

economic and other external factors or other disasters or crises;

price and volume fluctuations in the stock market at large that are unrelated to our operating performance; and

comments by securities analysts, or our failure to meet market expectations.

Over the two-year period ended October 27, 2009, the trading price of our common stock as reported on the Nasdaq Global Market ranged from a high of \$3.07 to a low of \$0.66 per share. As a result of this volatility, an investment in our stock is subject to substantial risk. Furthermore, the volatility of our stock price could negatively impact our ability to raise capital or acquire businesses or technologies.

We are contractually obligated to issue shares in the future, diluting the interest of current stockholders.

Pursuant to this prospectus supplement, we are offering warrants to purchase up to 4,000,000 shares of our common stock. In addition, as of June 30, 2009, there were outstanding warrants to purchase _____ shares of our common stock, at a weighted average exercise price of \$ _____ per share, outstanding options to purchase _____ shares of our common stock, at a weighted average exercise price of \$ _____ per share, and outstanding restricted stock units for _____ shares of our common stock. Moreover, we expect to issue additional options to purchase shares of our common stock to compensate employees, consultants and directors, and may issue additional shares to raise capital, to acquire other companies or technologies, to pay for services, or for other corporate purposes. Any such issuances will have the effect of diluting the interest of current stockholders.

Table of Contents

Note regarding forward-looking statements

This prospectus supplement, the accompanying prospectus, any free writing prospectus used in connection with this offering and the documents incorporated by reference herein and therein may contain forward looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act that involve substantial risks and uncertainties. Such statements include, without limitation, all statements as to expectation or belief and statements as to our future results of operations; the progress of our research, product development and clinical programs; the need for, and timing of, additional capital and capital expenditures; partnering prospects; costs of manufacture of products; the protection of, and the need for, additional intellectual property rights, including any related litigation; effects of regulations; the need for additional facilities; and potential market opportunities. Our actual results may vary materially from those contained in such forward-looking statements because of risks to which we are subject, including uncertainty as to whether the U.S. Food and Drug Administration (FDA) or other regulatory authorities will permit us to proceed with clinical testing of proposed products despite the novel and unproven nature of our technologies; the risk that our initial clinical trial and any other clinical trials or studies could be substantially delayed beyond their expected dates or cause us to incur substantial unanticipated costs; uncertainties in our ability to obtain the capital resources needed to continue our current research and development operations and to conduct the research, preclinical development and clinical trials necessary for regulatory approvals; the uncertainty regarding our ability to obtain a corporate partner or partners, if needed, to support the development and commercialization of our potential cell-based therapeutics products; the uncertainty regarding the outcome of our Phase I clinical trial in NCL and any other clinical trials or studies we may conduct in the future; the uncertainty regarding the validity and enforceability of our issued patents; the risk that we may not be able to manufacture additional master and working cell banks when needed; the uncertainty whether any products that may be generated in our cell-based therapeutics programs will prove clinically safe and effective; the uncertainty whether we will achieve revenue from product sales or become profitable; uncertainties regarding our obligations with respect to our former encapsulated cell therapy facilities in Rhode Island; obsolescence of our technologies; competition from third parties; intellectual property rights of third parties; litigation risks; and other risks to which we are subject. All forward-looking statements attributable to us or to persons acting on our behalf are expressly qualified in their entirety by the cautionary statements and risk factors set forth in Risk factors and elsewhere in this prospectus supplement, the risk factors disclosed in Part I, Item 1A of our Annual Report on Form 10-K for the fiscal year ended December 31, 2008 and Part II, Item 1A of our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2009.

S-12

Table of Contents

Use of proceeds

We estimate that the net proceeds from the sale of the 10,000,000 units will be approximately \$11,900,000, assuming that we sell the maximum number of units we are offering pursuant to this prospectus supplement. Because there is no minimum offering amount required as a condition to the closing of this offering, the actual number of units sold, placement agent fees and proceeds to us are not presently determinable and may be substantially less than the maximum amount set forth above.

We intend to use the net proceeds of this offering for general corporate purposes, including working capital, capital expenditures, research and development expenditures and clinical trial expenditures. A portion of the net proceeds may also be used for the acquisition of businesses, products and technologies that are complementary to ours, or for other strategic purposes.

Price range of common stock

Our common stock trades on The Nasdaq Global Market under the symbol STEM. The following table sets forth, for the periods indicated, the high and low intraday sales prices per share of our common stock as reported by The Nasdaq Global Market. These prices do not include retail markups, markdowns or commissions.

| | High | Low |
|---|--------|--------|
| Fiscal year ending December 31, 2007 | | |
| First quarter | \$3.63 | \$2.36 |
| Second quarter | 3.09 | 2.27 |
| Third quarter | 2.45 | 1.90 |
| Fourth quarter | 2.53 | 1.40 |
| Fiscal year ending December 31, 2008 | | |
| First quarter | \$1.90 | \$1.00 |
| Second quarter | 1.75 | 1.08 |
| Third quarter | 1.43 | 1.00 |
| Fourth quarter | 2.48 | 0.66 |
| Fiscal year ending December 31, 2009 | | |
| First quarter | \$3.07 | \$1.25 |
| Second quarter | 1.94 | 1.50 |
| Third quarter | 1.86 | 1.57 |
| Fourth quarter (through October 27, 2009) | 1.72 | 1.42 |

The last reported sales price of our common stock on The Nasdaq Global Market on October 27, 2009 was \$1.42 per share. As of October 27, 2009, there were outstanding 108,349,587 shares of our common stock.

Dividend policy

We have never declared or paid any cash dividends on our common stock. We anticipate that we will continue to retain our earnings, if any, for use in the operation of our business. Accordingly, we do not expect to pay any cash dividends on our common stock for the foreseeable future.

Table of Contents

Dilution

If you invest in our common stock and warrants, you will experience dilution to the extent of the difference between the price per share you pay in this offering and the net tangible book value per share of our common stock immediately after this offering.

Our net tangible book value as of June 30, 2009 was approximately \$ million, or \$ per share of common stock. Net tangible book value per share is equal to our total tangible assets minus total liabilities, all divided by the number of shares of common stock outstanding as of June 30, 2008. Assuming we sell 10,000,000 shares of common stock, the maximum number of shares we are offering pursuant to this prospectus supplement, at an offering price of \$1.25 per share, and after deducting our estimated placement agent fees and offering expenses payable by us, our as adjusted net tangible book value would have been approximately \$ million, or approximately \$ per share of common stock, as of . This represents an immediate increase in net tangible book value of approximately \$ per share to existing stockholders and an immediate dilution of approximately \$ per share to new investors. The following table illustrates this calculation on a per share basis:

| | |
|--|----|
| Offering price for one share of common stock and one warrant to purchase 0.40 shares of common stock | \$ |
| Net tangible book value per share as of June 30, 2008 | |
| Increase per share attributable to the offering | |

As adjusted net tangible book value per share after this offering

Dilution per share to new investors

Because there is no minimum offering amount required as a condition to the closing of this offering, the dilution per share to new investors may be more than that indicated above in the event that the actual number of units sold, if any, is less than the maximum number of units we are offering.

The above illustration of dilution per share to investors participating in this offering assumes (i) no exercise of outstanding options to purchase our common stock or outstanding warrants to purchase shares of our common stock; and (ii) no exercise of the warrants offered hereby. The exercise of outstanding options and warrants having an exercise price less than the offering price will increase dilution to new investors.

Investors that purchase common stock upon the exercise of the warrants offered hereby may experience dilution depending on our net tangible book value (deficit) at the time of exercise.

The number of shares of common stock shown above to be outstanding after this offering is based on the 108,349,587 shares outstanding as of October 27, 2009 and excludes:

- Ø shares of our common stock subject to options outstanding as of having a weighted average exercise price of \$ per share;
- Ø shares of our common stock subject to outstanding restricted stock units as of having a weighted average grant date fair value of \$;
- Ø shares of our common stock subject to outstanding stock appreciation rights as of having a weighted average exercise price of \$;
- Ø shares of our common stock that have been reserved for issuance in connection with future grants under our stock option plans as of ;
- Ø shares of our common stock that have been reserved for issuance upon exercise of outstanding warrants as of having a weighted average exercise price of \$ per share; and

Ø shares of common stock issuable upon the exercise of warrants offered hereby.

S-14

Table of Contents

Description of securities

In this offering, we are offering a maximum of 10,000,000 units, each consisting of (i) one share of our common stock and (ii) a warrant to purchase up to 0.40 shares of our common stock at an exercise price of \$1.25 per share.

Units will not be issued or certificated. The shares of common stock and warrants are immediately separable and will be issued separately. This prospectus supplement also relates to the offering of shares of our common stock issuable upon exercise, if any, of the warrants.

Common Stock

The material terms and provisions of our common stock are described under the caption Description of Common Stock starting on page 7 of the accompanying prospectus.

Warrants

The warrants offered in this offering will be issued pursuant to a subscription agreement between each of the purchasers and us. The following is a brief summary of the material terms of the warrants and is subject in all respects to the provisions contained in the warrants. The forms of warrants are being filed with a Current Report on Form 8-K and reference is made thereto for a complete description of the warrants. *Exercise Price.* The exercise price per share of common stock purchasable upon exercise of the warrants is \$1.50 per share of common stock being purchased. If we, at any time while the warrants are outstanding, pay a stock dividend on our common stock or otherwise make a distribution on any class of capital stock that is payable in shares of our common stock, subdivide outstanding shares of our common stock into a larger number of shares or combine the outstanding shares of our common stock into a smaller number of shares, then, the number, class and type of shares available under the warrants and the exercise price will be correspondingly adjusted to give the holder of the warrants, on exercise for the same aggregate exercise price, the total number, class, and type of shares or other property as the holder would have owned had the warrants been exercised prior to the event and had the holder continued to hold such shares until the event requiring adjustment.

Exercisability. Holders may exercise the warrants beginning on the date that is six months after the date of original issuance and at any time up to the date that is five years after such date the warrants become exercisable.

Cashless Exercise. If at any time during the warrant exercisability period the fair market value of our common stock exceeds the exercise price of the warrants and the issuance of shares of our common stock upon exercise of the warrant is not covered by an effective registration statement, we or the holder are permitted to effect a cashless exercise of the warrants (in whole or in part) by having the holder surrendering the warrants to us, together with delivery to us of a duly executed exercise notice, canceling a portion of the warrant in payment of the purchase price payable in respect of the number of shares of our common stock purchased upon such exercise.

Transferability. The warrants may be transferred at the option of the warrant holder upon surrender of the warrants with the appropriate instruments of transfer. *Exchange Listing.* We do not plan on making an application to list the warrants on The Nasdaq Global Market, any national securities exchange or other nationally recognized trading system. *Rights as a Stockholder.* Except as otherwise provided in the warrants or by virtue of such holder's ownership of shares of our common stock, the holders of the warrants do not have the rights or privileges of holders of our common stock, including any voting rights, until they exercise their warrants.

Fundamental Transactions. In the event of any fundamental transaction, as described in the warrants and generally including any merger with another entity, the sale, transfer or other disposition of all or substantially all of our assets to another entity, or the acquisition by a person of more than 50% of our common stock, then the holders of the warrants will thereafter have the right to receive upon exercise of the warrants such shares of stock, securities or assets as would have been issuable or payable with respect to or in exchange for a number of shares of our common stock equal to the number of shares of our common stock issuable upon exercise

Table of Contents

of the warrants immediately prior to the fundamental transaction, had the fundamental transaction not taken place, and appropriate provision will be made so that the provisions of the warrants (including, for example, provisions relating to the adjustment of the exercise price) will thereafter be applicable, as nearly equivalent as may be practicable in relation to any share of stock, securities or assets deliverable upon the exercise of the warrants after the fundamental transaction. In lieu of the right to receive upon exercise the shares of stock securities or assets as would have been issuable or payable with respect to or in exchange for a number of shares of our common stock, the holders of the warrants may require us to redeem the warrant for a purchase price payable in cash of the Black-Scholes value of the warrant, as calculated pursuant to the terms of the warrant.

Limits on Exercise of Warrants. Except upon at least 61 days prior notice from the holder to us, the holder will not have the right to exercise any portion of the warrant if the holder, together with its affiliates, would beneficially own in excess of 4.99% of the number of shares of our common stock (including securities convertible into common stock) outstanding immediately after the exercise.

S-16

Table of Contents**Plan of distribution**

Pursuant to a placement agency agreement between us and Chardan Capital Markets, LLC (Chardan Capital) we have engaged Chardan Capital as our exclusive placement agent to solicit offers to purchase the units in this offering. The placement agent is not purchasing or selling any of the units we are offering, and it is not required to arrange the purchase or sale of any specific number of units or dollar amount, but it has agreed to use commercially reasonable efforts to arrange for the sale of the units.

The placement agent proposes to arrange for the sale of the units we are offering pursuant to this prospectus supplement to one or more investors through subscription agreements directly between the purchasers and us. All of the units will be sold at the same price and, we expect, at a single closing. We established the price following negotiations with prospective investors and with reference to the prevailing market price of our common stock, recent trends in such price and other factors. It is possible that not all of the units we are offering pursuant to this prospectus supplement will be sold at the closing, in which case our net proceeds would be reduced. We expect that the sale of the units will be completed on the date indicated on the cover page of this prospectus supplement.

In connection with this offering, the placement agent may distribute this prospectus supplement and the accompanying prospectus electronically.

We will pay the placement agent a placement agent fee equal to 4.0% of the gross proceeds of this offering. The following table shows the per share and total placement agent fee we will pay to the placement agent in connection with the sale of the units, assuming the purchase of all of the units we are offering.

| | |
|----------|------------|
| Per unit | \$ 0.05 |
| Total | \$ 500,000 |

We estimate the total expenses of this offering, which will be payable by us, excluding the placement agent fee, will be approximately \$100,000. In no event will the total amount of compensation paid to the placement agent and other securities brokers and dealers upon completion of this offering exceed 8% of the gross proceeds of the offering. The estimated offering expenses payable by us, in addition to the placement agent fee of \$500,000, are approximately \$600,000, which includes legal and printing costs and various other fees associated with registering and listing the common stock. After deducting certain fees due to the placement agent and our estimated offering expenses, we expect the net proceeds from this offering to be approximately \$11,900,000.

We have agreed to indemnify the placement agent against certain liabilities, including liabilities under the Securities Act of 1933, as amended, and liabilities arising from breaches and representations and warranties contained in the placement agency agreement. We have also agreed to contribute to payments the placement agent may be required to make in respect of such liabilities.

The placement agency agreement is included as an exhibit to our Current Report on Form 8-K that we will file with the Commission in connection with this offering.

NO SALES OF SIMILAR SECURITIES

We and our executive officers and directors have entered into lock-up agreements with the placement agent. Under these agreements, we and each of these persons may not, without the prior written approval of the placement agent, subject to exceptions, offer, sell, contract to sell or otherwise dispose of or hedge our common stock or securities convertible into or exercisable or exchangeable for our common stock. These restrictions will be in effect for a period of thirty (30) business days after the date of this prospectus supplement. However, these restrictions do not prohibit us from issuing securities in connection with a partnership, research, licensing, collaboration, joint venture or similar arrangement, or an acquisition of another business or entity or its stock, assets or technology. At any time and without public notice, Chardan Capital may in its sole discretion release all or some of the securities from these lock-up agreements.

NASDAQ GLOBAL MARKET

Our common stock is quoted on The Nasdaq Global Market under the symbol STEM.

PRICE STABILIZATION

Table of Contents

In connection with this offering, the placement agent may engage in activities that stabilize, maintain or otherwise affect the price of our common stock. These activities may maintain the market price of our common stock at a level above that which might otherwise prevail in the open market. The placement agent is not required to engage in these activities and, if commenced, may end any of these activities at any time. The placement agent may carry out these transactions on The Nasdaq Global Market, in the over-the-counter market or otherwise.

AFFILIATIONS

The placement agent and its affiliates may provide certain commercial banking, financial advisory or investment banking services for us for which they receive fees. The placement agent and its affiliates may from time to time in the future engage in transactions with us and perform services for us in the ordinary course of their business.

S-18

Table of Contents

Where you can find more information

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>. The SEC's website contains reports, proxy and information statements and other information regarding issuers, such as us, that file electronically with the SEC. You may also read and copy any document we file with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Room 1580, Washington, D.C. 20549. You may also obtain copies of these documents at prescribed rates by writing to the SEC. Please call the SEC at 1-800-SEC-0330 for further information on the operation of its Public Reference Room.

Incorporation of certain documents by reference

The SEC allows us to incorporate by reference into this prospectus supplement the information we have filed with the SEC. The information we incorporate by reference into this prospectus supplement is an important part of this prospectus supplement. Any statement in a document we incorporate by reference into this prospectus supplement or the accompanying prospectus will be considered to be modified or superseded to the extent a statement contained in this prospectus supplement or any other subsequently filed document that is incorporated by reference into this prospectus supplement modifies or supersedes that statement. The modified or superseded statement will not be considered to be a part of this prospectus supplement or accompanying prospectus, as applicable, except as modified or superseded.

We incorporate by reference into this prospectus supplement the information contained in the documents listed below, which is considered to be a part of this prospectus supplement:

- Ø Our Annual Report on Form 10-K for the year ended December 31, 2009, including any amendment filed for the purpose of updating such Annual Report;
- Ø Our Quarterly Reports on Form 10-Q for the quarterly periods ending March 31, 2009 and June 30, 2009;
- Ø Our Current Reports on Form 8-K filed with the SEC on March 3, 2009, March 30, 2009, April 1, 2009, May 18, 2009 and June 8, 2009 (excluding any information furnished in such reports under Item 9.01);
- Ø Our Proxy Statement of Schedule 14A filed with the SEC on April 30, 2009; and
- Ø the description of our common stock and related rights contained in our registration statements on Form 8-A (file no. 000-19871) filed under the Exchange Act, including any amendment or report filed for the purpose of updating such description.

We also incorporate by reference all documents filed pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus supplement and prior to the termination of this offering; provided, however, that we are not incorporating any information furnished under Item 2.02, Item 7.01 or Item 9.01 of any current report on Form 8-K we may subsequently file.

Statements made in this prospectus supplement or the accompanying prospectus or in any document incorporated by reference in this prospectus supplement or the accompanying prospectus as to the contents of any contract or other document referred to herein or therein are not necessarily complete, and in each instance reference is made to the copy of such contract or other document filed as an exhibit to the documents incorporated by reference, each such statement being qualified in all material respects by such reference.

Table of Contents

You may request a copy of these filings, at no cost, by writing or telephoning us at the following address:

StemCells, Inc.
3155 Porter Drive
Palo Alto, CA 94304
Attention: Investor Relations
Phone: (650) 475-3100
email: irpr@stemcellsinc.com

Copies of these filings are also available, without charge, on our Internet website at www.stemcellsinc.com after they are filed electronically with the SEC.

Legal matters

Various legal matters with respect to the validity of the shares of common stock and the warrants offered by this prospectus supplement will be passed upon for us by Ropes & Gray LLP.

Experts

The financial statements and management's assessment of the effectiveness of internal control over financial reporting incorporated by reference in this prospectus and elsewhere in the registration statement have been audited by Grant Thornton LLP, independent registered public accountants, as indicated in their reports with respect thereto, and are included herein in reliance upon the authority of said firm as experts in giving said reports.

S-20

Table of Contents

PROSPECTUS

\$100,000,000
STEMCELLS, INC.
Common Stock
Preferred Stock
Warrants
Debt Securities

We may offer to the public, from time to time, in one or more series or issuances:

shares of our common stock;

shares of our preferred stock;

warrants to purchase shares of our common stock, preferred stock and/or debt securities; or

debt securities consisting of debentures, notes or other evidences of indebtedness.

This prospectus provides a general description of the securities we may offer. Each time we sell securities, we will provide specific terms of the securities offered in a supplement to this prospectus. The prospectus supplement may also add, update or change information contained in this prospectus. You should read this prospectus and the applicable prospectus supplement carefully before you invest in any securities. This prospectus may not be used to consummate a sale of securities unless accompanied by an applicable prospectus supplement. You should read both this prospectus and any prospectus supplement together with additional information described under the heading **Where You Can Find More Information** before you make your investment decision.

We will sell these securities directly to our stockholders or to purchasers or through agents on our behalf or through underwriters or dealers as designated from time to time. If any agents or underwriters are involved in the sale of any of these securities, the applicable prospectus supplement will provide the names of the agents or underwriters and any applicable fees, commissions or discounts.

Our common stock is traded on the Nasdaq Global Market under the symbol **STEM**. On June 11, 2008, the closing price of our common stock was \$1.37 per share.

Investing in our securities involves risks. See **Risk Factors on page 3.**

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is July 18, 2008

TABLE OF CONTENTS

| | Page |
|--|-------------|
| <u>About this Prospectus</u> | 1 |
| <u>About StemCells, Inc.</u> | 2 |
| <u>Risk Factors</u> | 3 |
| <u>Note Regarding Forward-Looking Statements</u> | 3 |
| <u>Use of Proceeds</u> | 4 |
| <u>Ratio of Earnings to Fixed Charges</u> | 4 |
| <u>Plan of Distribution</u> | 5 |
| <u>Description of Common Stock</u> | 7 |
| <u>Description of Preferred Stock</u> | 7 |
| <u>Description of Warrants</u> | 8 |
| <u>Description of Debt Securities</u> | 9 |
| <u>Where You Can Find More Information</u> | 16 |
| <u>Incorporation of Certain Documents by Reference</u> | 16 |
| <u>Legal Matters</u> | 17 |
| <u>Experts</u> | 17 |

You should rely only on the information contained in this prospectus. We have not authorized anyone to give you information different from that contained in this prospectus. We are not making an offer to sell these securities in any jurisdiction where the offer is not permitted. The information contained in this prospectus is accurate only as of the date on the front cover of this prospectus, regardless of when this prospectus is delivered or when any sale of our securities occurs. Our business, financial condition, results of operations and prospects may have changed since that date.

Table of Contents

ABOUT THIS PROSPECTUS

This prospectus is a 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 offer to sell any combination of the securities described in this prospectus in one or more offerings up to a total dollar amount of \$100,000,000. This prospectus provides you with a general description of the securities we may offer. Each time we sell securities under this shelf registration, we will provide a prospectus supplement that will contain specific information about the terms of that offering. The prospectus supplement may also add, update or change information contained in this prospectus. You should read both this prospectus and any prospectus supplement, including all documents incorporated herein or therein by reference, together with additional information described under [Where You Can Find More Information](#).

We have not authorized any dealer, salesman or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus and any accompanying prospectus supplement. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus or an accompanying prospectus supplement. This prospectus and the accompanying prospectus supplement, if any, do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they relate, nor do this prospectus and the accompanying prospectus supplement constitute an offer to sell or the solicitation of an offer to buy securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. You should not assume that the information contained in this prospectus and the accompanying prospectus supplement, if any, is accurate on any date subsequent to the date set forth on the front of the document or that any information we have incorporated by reference is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus and any accompanying prospectus supplement is delivered or securities are sold on a later date.

Table of Contents

ABOUT STEMCELLS, INC.

StemCells, Inc. is engaged in the discovery and development of cell-based therapeutics to treat damage to, or degeneration of, major organ systems. Our aim is to restore or support organ function, improve patients' lives and reduce the substantial health care costs associated with these diseases and disorders by identifying and developing stem and progenitor cells as potential therapeutic agents. We currently have product development programs for two cell types: the human neural stem cell and human liver engrafting cells. In our CNS Program, we are conducting a Phase I clinical trial to evaluate the safety and preliminary efficacy of our HuCNS-SC[®] product candidate (purified human neural stem cells) as a treatment for infantile and late infantile neuronal ceroid lipofuscinosis (NCL), two forms of a group of disorders often referred to as Batten disease. We have completed enrollment and dosing in this six-patient trial and expect it to be completed in early 2009. In addition, we are conducting preclinical work for spinal cord injury, myelin disorders and retinal disorders. In our Liver Program, we are in preclinical development with, and are continuing to improve processes to isolate and purify, our human liver engrafting cells (hLEC).

Many degenerative diseases are caused by the loss of normal cellular function in a particular organ. When cells are damaged or destroyed, they no longer produce, metabolize or accurately regulate substances, such as sugars, amino acids, neurotransmitters, and hormones, which are essential to life. Although traditional pharmaceuticals and genetically engineered biologics may have some utility in addressing a degenerative condition, there is no technology existing today that can deliver these essential substances precisely to the sites of action, under the appropriate physiological regulation, in the appropriate quantity, or for the duration required to cure the degenerative condition. Cells, however, can do all this naturally. Thus, transplantation of stem or progenitor cells may prevent the loss of, or even generate new, functional cells and potentially maintain or restore organ function and the patient's health.

We believe that, if successfully developed, our cell technologies will create the basis for therapies that would address a number of conditions with significant unmet medical needs. Many neurodegenerative diseases involve the failure of an organ that cannot be transplanted, i.e., the brain or spinal cord. Many liver diseases, such as hepatitis, can be addressed by a liver transplant, but transplantable livers are in very limited supply. We estimate that degenerative conditions of the central nervous system (CNS) and the liver together affect more than 35 million people in the United States and account for nearly \$200 billion annually in health care costs.¹

Our principal executive offices are located at StemCells, Inc., 3155 Porter Drive, Palo Alto, CA 94304 and our phone number is (650) 475-3100.

¹ This estimate is based on information from the Alzheimer's Association, the Alzheimer's Disease Education & Referral Center (National Institute on Aging), the National Parkinson Foundation, the National Institutes of Health's National

Institute on
Neurological
Disorders and
Stroke, the
Foundation for
Spinal Cord
Injury
Prevention,
Care & Cure,
the Travis Roy
Foundation, the
Centers for
Disease Control
and Prevention,
the Wisconsin
Chapter of the
Huntington's
Disease Society
of America, the
American Liver
Foundation, the
Cincinnati
Children's
Hospital
Medical Center,
and JAIDS.

Table of Contents**RISK FACTORS**

You should consider the Risk Factors included under Part I-Item 1A. of our most recent Annual Report on Form 10-K, which is incorporated by reference in this prospectus. The risks and uncertainties we describe are not the only ones facing us. Additional risks not presently known to us, or that we currently deem immaterial, may also impair our business operations. If any of these risks were to occur, our business, financial condition, and results of operations could be severely harmed. This could cause the trading price of our common stock to decline, and you could lose all or part of your investment.

FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated in this prospectus by reference may contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the Securities Act), and Section 21E of the Securities Exchange Act of 1934, as amended (the Exchange Act). These statements may be identified by the use of forward-looking words or phrases such as anticipate, believe, could, expect, intend, forward, may, planned, potential, should, will, and would. These forward-looking statements reflect our current expectations and are based upon currently available data. The Private Securities Litigation Reform Act of 1995 provides a safe harbor for such forward-looking statements. In order to comply with the terms of the safe harbor, we note that a variety of factors could cause actual results and experience to differ materially from the anticipated results or other expectations expressed in the forward-looking statements.

Such statements include, without limitation, all statements as to expectation or belief and statements as to our future results of operations; the progress of our research, product development and clinical programs; the need for, and timing of, additional capital and capital expenditures; partnering prospects; costs of manufacture of products; the protection of, and the need for, additional intellectual property rights; effects of regulations; the need for additional facilities; and potential market opportunities. Our actual results may vary materially from those contained in such forward-looking statements because of risks to which we are subject, including uncertainty as to whether the U.S. Food and Drug Administration (FDA) or other regulatory authorities will permit us to proceed with clinical testing of proposed products despite the novel and unproven nature of our technologies; the risk that our initial clinical trial and any other clinical trials or studies could be substantially delayed beyond their expected dates or cause us to incur substantial unanticipated costs; uncertainties in our ability to obtain the capital resources needed to continue our current research and development operations and to conduct the research, preclinical development and clinical trials necessary for regulatory approvals; the uncertainty regarding our ability to obtain a corporate partner or partners, if needed, to support the development and commercialization of our potential cell-based therapeutics products; the uncertainty regarding the outcome of our Phase I clinical trial in NCL and any other clinical trials or studies we may conduct in the future; the uncertainty regarding the validity and enforceability of our issued patents; the uncertainty whether any products that may be generated in our cell-based therapeutics programs will prove clinically safe and effective; the uncertainty whether we will achieve revenue from product sales or become profitable; uncertainties regarding our obligations with respect to our former encapsulated cell therapy facilities in Rhode Island; obsolescence of our technologies; competition from third parties; intellectual property rights of third parties; litigation risks; and other risks to which we are subject. All forward-looking statements attributable to us or to persons acting on our behalf are expressly qualified in their entirety by the cautionary statements and risk factors set forth in Risk Factors in this prospectus.

The forward-looking statements included in this prospectus represent our estimates as of the date of this prospectus. We specifically disclaim any obligation to update these forward-looking statements in the future. These forward-looking statements should not be relied upon as representing our estimates or views as of any date subsequent to the date of this prospectus.

Table of Contents**USE OF PROCEEDS**

Except as otherwise provided in the applicable prospectus supplement, we intend to use the net proceeds from the sale of the securities covered by this prospectus for general corporate purposes, which may include working capital, capital expenditures, research and development expenditures, clinical trial expenditures, acquisitions of new technologies or businesses, and investments. Additional information on the use of net proceeds from the sale of securities covered by this prospectus may be set forth in the prospectus supplement relating to the specific offering.

RATIO OF EARNINGS TO FIXED CHARGES

Our earnings are inadequate to cover fixed charges. The following table sets forth the dollar amount of the coverage. We have not included a ratio of earnings to combined fixed charges and preferred stock dividends because we do not have any preferred stock outstanding.

| | Year Ended December 31, | | | | | Three Months Ended March 31, |
|---|-------------------------|-------------|-------------|-------------|-------------|---------------------------------------|
| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
| | (in thousands) | | | | | |
| Ratio of earnings to fixed charges (1) | | | | | | |
| Deficiency of earnings available to cover fixed charges | \$ (14,425) | \$ (15,330) | \$ (11,738) | \$ (18,948) | \$ (25,023) | \$ (6,545) |

(1) In each of the periods presented, our earnings were insufficient to cover fixed charges and accordingly ratios are not presented.

Table of Contents

PLAN OF DISTRIBUTION

We may sell securities in any of the ways described below or in any combination of these:
to or through underwriters or dealers;

through one or more agents; or

directly to purchasers or to a single purchaser.

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 or names of any underwriters, dealers or agents and the amounts of securities underwritten or purchased by each of them;

the initial public offering price of the securities and the proceeds to us and any discounts, commissions or concessions allowed or reallocated or paid to dealers; and

any securities exchanges on which the securities may be listed.

Any initial public offering price and any discounts or concessions allowed or reallocated or paid to dealers may be changed from time to time.

Only the agents or underwriters named in each prospectus supplement are agents or underwriters in connection with the securities being offered thereby.

We may authorize underwriters, dealers 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 each applicable 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 each applicable 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 be subject only to those conditions set forth in each applicable prospectus supplement, and each prospectus supplement will set forth any commissions we pay for solicitation of these contracts.

Agents, underwriters and other third parties described above may be entitled to indemnification by us against certain civil liabilities, including liabilities under the Securities Act of 1933, or to contribution with respect to payments which the agents or underwriters may be required to make in respect thereof. Agents, underwriters and such other third parties may be customers of, engage in transactions with, or perform services for us in the ordinary course of business.

Table of Contents

One or more firms, referred to as remarketing firms, may also offer or sell the securities, if a prospectus supplement so indicates, in connection with a remarketing arrangement upon their purchase. Remarketing firms will act as principals for their own accounts or as our agents. These remarketing firms will offer or sell the securities in accordance with the terms of the securities. Each prospectus supplement will identify any remarketing firm and the terms of its agreement, if any, with us and will describe the remarketing firm and the terms of its agreement, if any, with us and will describe the remarketing firm's compensation. Remarketing firms may be deemed to be underwriters in connection with the securities they remarket. Remarketing firms may be entitled under agreements that may be entered into with us to indemnification by us against certain civil liabilities, including liabilities under the Securities Act of 1933, and may be customers of, engage in transactions with or perform services for us in the ordinary course of business.

Certain underwriters may use this prospectus and any accompanying prospectus supplement for offers and sales related to market-making transactions in the securities. These underwriters may act as principal or agent in these transactions, and the sales will be made at prices related to prevailing market prices at the time of sale.

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. Underwriters may make a market in these securities, but will not be obligated to do so and may discontinue any market making at any time without notice. We can make no assurance as to the liquidity of, or the existence of trading markets for, any of our securities.

Certain persons participating in this offering may engage in over-allotment, stabilizing transactions, short covering transactions and penalty bids in accordance with rules and regulations under the Exchange Act. Over-allotment involves sales in excess of the offering size, which create a short position. Stabilizing transactions permit bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum. Short covering transactions involve purchases of the securities in the open market after the distribution is completed to cover short positions. Penalty bids permit the underwriters to reclaim a selling concession from a dealer when the securities originally sold by the dealer are purchased in a covering transaction to cover short positions. Those activities may cause the price of the securities to be higher than it would otherwise be. If commenced, the underwriters may discontinue any of the activities at any time.

Table of Contents

DESCRIPTION OF COMMON STOCK

We are authorized to issue 125,000,000 shares of common stock. As of June 1, 2008, we had 80,810,302 shares of common stock outstanding.

The following summary of certain provisions of our common stock does not purport to be complete. You should refer to our restated certificate of incorporation and our amended and restated by-laws, both of which are on file with the SEC as exhibits to previous SEC filings. The summary below is also qualified by provisions of applicable law.

General

Holder of common stock are entitled to one vote per share on matters on which our stockholders vote. There are no cumulative voting rights. Holders of common stock are entitled to receive dividends, if declared by our board of directors, out of funds that we may legally use to pay dividends. If we liquidate or dissolve, holders of common stock are entitled to share ratably in our assets once our debts and any liquidation preference owed to any then-outstanding preferred stockholders are paid. Our certificate of incorporation does not provide the common stock with any redemption, conversion or preemptive rights. All shares of common stock that are outstanding as of the date of this prospectus and, upon issuance and sale, all shares we are offering by this prospectus, will be fully-paid and nonassessable.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare Trust Company, N.A.

Nasdaq Global Market

Our common stock is listed for quotation on the Nasdaq Global Market under the symbol STEM.

DESCRIPTION OF PREFERRED STOCK

We are authorized to issue 1,000,000 shares of undesignated preferred stock. As of June 1, 2008, no shares of our preferred stock were outstanding. The following summary of certain provisions of our preferred stock does not purport to be complete. You should refer to our restated certificate of incorporation and our amended and restated by-laws, both of which are on file with the SEC as exhibits to previous SEC filings. The summary below is also qualified by provisions of applicable law.

Our board of directors may, without further action by our stockholders, from time to time, direct the issuance of shares of preferred stock in series and may, at the time of issuance, determine the rights, preferences and limitations of each series, including voting rights, dividend rights and redemption and liquidation preferences. Satisfaction of any dividend preferences of outstanding shares of preferred stock would reduce the amount of funds available for the payment of dividends on shares of our common stock. Holders of shares of preferred stock may be entitled to receive a preference payment in the event of any liquidation, dissolution or winding-up of our company before any payment is made to the holders of shares of our common stock. In some circumstances, the issuance of shares of preferred stock may render more difficult or tend to discourage a merger, tender offer or proxy contest, the assumption of control by a holder of a large block of our securities or the removal of incumbent management. Upon the affirmative vote of our board of directors, without stockholder approval, we may issue shares of preferred stock with voting and conversion rights which could adversely affect the holders of shares of our common stock.

If we offer a specific series of preferred stock under this prospectus, we will describe the terms of the preferred stock in the prospectus supplement for such offering and will file a copy of the certificate establishing the terms of the preferred stock with the SEC. To the extent required, this description will include:

the title and stated value;

Table of Contents

the number of shares offered, the liquidation preference per share and the purchase price;

the dividend rate(s), period(s) and/or payment date(s), or method(s) of calculation for such 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;

the provisions for a sinking fund, if any;

the provisions for redemption, if applicable;

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 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 exchange period;

voting rights, if any, of the preferred stock;

a discussion of any material and/or special U.S. federal income tax considerations applicable to the preferred stock;

the relative ranking and preferences of the preferred stock as to dividend rights and rights upon liquidation, dissolution or winding up of the affairs of StemCells, Inc.; and

any material 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 upon liquidation, dissolution or winding up of StemCells, Inc.

The preferred stock offered by this prospectus, when issued, will not have, or be subject to, any preemptive or similar rights.

Transfer Agent and Registrar

The transfer agent and registrar for any series or class of preferred stock will be set forth in each applicable prospectus supplement.

DESCRIPTION OF WARRANTS

We may issue warrants to purchase shares of our common stock, preferred stock and/or debt securities in one or more series together with other securities or separately, as described in each applicable prospectus supplement. Below is a description of certain general terms and provisions of the warrants that we may offer. Particular terms of the warrants will be described in the applicable warrant agreements and the applicable prospectus supplement to the warrants.

The applicable prospectus supplement will contain, where applicable, the following terms of, and other information relating to, the warrants:

the specific designation and aggregate number of, and the price at which we will issue, the warrants;

the currency or currency units in which the offering price, if any, and the exercise price are payable;

the designation, amount and terms of the securities purchasable upon exercise of the warrants;

if applicable, the exercise price for shares of our common stock and the number of shares of common stock to be received upon exercise of the warrants;

if applicable, the exercise price for shares of our preferred stock, the number of shares of preferred stock to be received upon exercise, and a description of that series of our preferred stock;

Table of Contents

if applicable, the exercise price for our debt securities, the amount of debt securities to be received upon exercise, and a description of that series of debt securities;

the date on which the right to exercise the warrants will begin and the date on which that right will expire or, if you may not continuously exercise the warrants throughout that period, the specific date or dates on which you may exercise the warrants;

whether the warrants will be issued in fully registered form or bearer form, in definitive or global form or in any combination of these forms, although, in any case, the form of a warrant included in a unit will correspond to the form of the unit and of any security included in that unit;

any applicable material U.S. federal income tax consequences;

the identity of the warrant agent for the warrants and of any other depositaries, execution or paying agents, transfer agents, registrars or other agents;

the proposed listing, if any, of the warrants or any securities purchasable upon exercise of the warrants on any securities exchange;

if applicable, the date from and after which the warrants and the common stock, preferred stock and/or debt securities will be separately transferable;

if applicable, the minimum or maximum amount of the warrants that may be exercised at any one time;

information with respect to book-entry procedures, if any;

the anti-dilution provisions of the warrants, if any;

any redemption or call provisions;

whether the warrants are to be sold separately or with other securities as parts of units; and

any additional terms of the warrants, including terms, procedures and limitations relating to the exchange and exercise of the warrants.

Transfer Agent and Registrar

The transfer agent and registrar for any warrants will be set forth in the applicable prospectus supplement.

DESCRIPTION OF DEBT SECURITIES

We will issue the debt securities offered by this prospectus and any accompanying prospectus supplement under an indenture to be entered into between us and the trustee identified in the applicable prospectus supplement. The terms of the debt securities will include those stated in the indenture and those made part of the indenture by reference to the Trust Indenture Act of 1939, as in effect on the date of the indenture. We have filed a copy of the form of indenture as an exhibit to the registration statement in which this prospectus is included. The indenture will be subject to and governed by the terms of the Trust Indenture Act of 1939.

We may offer under this prospectus up to an aggregate principal amount of \$100,000,000 in debt securities; or if debt securities are issued at a discount, or in a foreign currency, foreign currency units or composite currency, the principal amount as may be sold for an initial public offering price of up to \$100,000,000. Unless otherwise specified in the applicable prospectus supplement, the debt securities will represent direct, unsecured obligations of StemCells, Inc. and will rank equally with all of our other unsecured indebtedness.

The following statements relating to the debt securities and the indenture are summaries, qualified in their entirety to the detailed provisions of the indenture.

Table of Contents

General

We may issue the debt securities in one or more series with the same or various maturities, at par, at a premium, or at a discount. We will describe the particular terms of each series of debt securities in a prospectus supplement relating to that series, which we will file with the SEC.

The prospectus supplement will set forth, to the extent required, the following terms of the debt securities in respect of which the prospectus supplement is delivered:

the title of the series;

the aggregate principal amount;

the issue price or prices, expressed as a percentage of the aggregate principal amount of the debt securities;

any limit on the aggregate principal amount;

the date or dates on which principal is payable;

the interest rate or rates (which may be fixed or variable) or, if applicable, the method used to determine such rate or rates;

the date or dates from which interest, if any, will be payable and any regular record date for the interest payable;

the place or places where principal and, if applicable, premium and interest, is payable;

the terms and conditions upon which we may, or the holders may require us to, redeem or repurchase the debt securities;

the denominations in which such debt securities may be issuable, if other than denominations of \$1,000 or any integral multiple of that number;

whether the debt securities are to be issuable in the form of certificated debt securities (as described below) or global debt securities (as described below);

the portion of principal amount that will be payable upon declaration of acceleration of the maturity date if other than the principal amount of the debt securities;

the currency of denomination;

the designation of the currency, currencies or currency units in which payment of principal and, if applicable, premium and interest, will be made;

if payments of principal and, if applicable, premium or interest, on the debt securities are to be made in one or more currencies or currency units other than the currency of denomination, the manner in which the exchange rate with respect to such payments will be determined;

if amounts of principal and, if applicable, premium and interest may be determined by reference to an index based on a currency or currencies or by reference to a commodity, commodity index, stock exchange index or financial index, then the manner in which such amounts will be determined;

the provisions, if any, relating to any collateral provided for such debt securities;

any addition to or change in the covenants and/or the acceleration provisions described in this prospectus or in the indenture;

any events of default, if not otherwise described below under Events of Default ;

the terms and conditions, if any, for conversion into or exchange for shares of common stock or preferred stock;

any depositaries, interest rate calculation agents, exchange rate calculation agents or other agents; and

Table of Contents

the terms and conditions, if any, upon which the debt securities shall be subordinated in right of payment to other indebtedness of StemCells, Inc.

We may issue discount debt securities that provide for an amount less than the stated principal amount to be due and payable upon acceleration of the maturity of such debt securities in accordance with the terms of the indenture. We may also issue debt securities in bearer form, with or without coupons. If we issue discount debt securities or debt securities in bearer form, we will describe material U.S. federal income tax considerations and other material special considerations which apply to these debt securities in the applicable prospectus supplement.

We may issue debt securities denominated in or payable in a foreign currency or currencies or a foreign currency unit or units. If we do, we will describe the restrictions, elections, and general tax considerations relating to the debt securities and the foreign currency or currencies or foreign currency unit or units in the applicable prospectus supplement.

Exchange and/or Conversion Rights

We may issue debt securities which can be exchanged for or converted into shares of common stock or preferred stock. If we do, we will describe the terms of exchange or conversion in the prospectus supplement relating to these debt securities.

Transfer and Exchange

We may issue debt securities that will be represented by either:

book-entry securities, which means that there will be one or more global securities registered in the name of a depositary or a nominee of a depositary; or

certificated securities, which means that they will be represented by a certificate issued in definitive registered form.

We will specify in the prospectus supplement applicable to a particular offering whether the debt securities offered will be book-entry or certificated securities.

Certificated Debt Securities

If you hold certificated debt securities, you may transfer or exchange such debt securities at the trustee's office or at the paying agent's office or agency in accordance with the terms of the indenture. You will not be charged a service charge for any transfer or exchange of certificated debt securities but may be required to pay an amount sufficient to cover any tax or other governmental charge payable in connection with such transfer or exchange.

You may effect the transfer of certificated debt securities and of the right to receive the principal of, premium, and/or interest, if any, on the certificated debt securities only by surrendering the certificate representing the certificated debt securities and having us or the trustee issue a new certificate to the new holder.

Global Securities

If we decide to issue debt securities in the form of one or more global securities, then we will register the global securities in the name of the depositary for the global securities or the nominee of the depositary, and the global securities will be delivered by the trustee to the depositary for credit to the accounts of the holders of beneficial interests in the debt securities.

The prospectus supplement will describe the specific terms of the depositary arrangement for debt securities of a series that are issued in global form. None of our company, the trustee, any payment agent or the security registrar will have any responsibility or liability for any aspect of the records relating to or payments made on account of beneficial ownership interests in a global debt security or for maintaining, supervising or reviewing any records relating to these beneficial ownership interests.

Table of Contents

No Protection in the Event of Change of Control

The indenture does not have any covenants or other provisions providing for a put or increased interest or otherwise that would afford holders of debt securities additional protection in the event of a recapitalization transaction, a change of control of StemCells, Inc., or a highly leveraged transaction. If we offer any covenants or provisions of this type with respect to any debt securities covered by this prospectus, we will describe them in the applicable prospectus supplement.

Covenants

Unless otherwise indicated in this prospectus or a prospectus supplement, the debt securities will not have the benefit of any covenants that limit or restrict our business or operations, the pledging of our assets or the incurrence by us of indebtedness. We will describe in the applicable prospectus supplement any material covenants in respect of a series of debt securities.

Consolidation, Merger and Sale of Assets

We have agreed in the indenture that we will not consolidate with or merge into any other person or convey, transfer, sell or lease our properties and assets substantially as an entirety to any person, unless:

the person formed by the consolidation or into or with which we are merged or the person to which our properties and assets are conveyed, transferred, sold or leased, is a corporation organized and existing under the laws of the U.S., any state or the District of Columbia or a corporation or comparable legal entity organized under the laws of a foreign jurisdiction and, if we are not the surviving person, the surviving person has expressly assumed all of our obligations, including the payment of the principal of and, premium, if any, and interest on the debt securities and the performance of the other covenants under the indenture; and

immediately before and immediately after giving effect to the transaction, no event of default, and no event which, after notice or lapse of time or both, would become an event of default, has occurred and is continuing under the indenture.

Events of Default

Unless otherwise specified in the applicable prospectus supplement, the following events will be events of default under the indenture with respect to debt securities of any series:

we fail to pay any principal or premium, if any, when it becomes due;

we fail to pay any interest within 30 days after it becomes due;

we fail to observe or perform any other covenant in the debt securities or the indenture for 60 days after written notice specifying the failure from the trustee or the holders of not less than 25% in aggregate principal amount of the outstanding debt securities of that series; and

certain events involving bankruptcy, insolvency or reorganization of StemCells, Inc. or any of our significant subsidiaries.

The trustee may withhold notice to the holders of the debt securities of any series of any default, except in payment of principal of or premium, if any, or interest on the debt securities of a series, if the trustee considers it to be in the best interest of the holders of the debt securities of that series to do so.

If an event of default (other than an event of default resulting from certain events of bankruptcy, insolvency or reorganization) occurs, and is continuing, then the trustee or the holders of not less than 25% in aggregate principal amount of the outstanding debt securities of any series may accelerate the maturity of the debt securities. If this happens, the entire principal amount, plus the premium, if any, of all the outstanding debt securities of the affected series plus accrued interest to the date of acceleration will be immediately due and payable. At any time after the acceleration, but before a judgment or decree based on such acceleration is obtained by the trustee, the holders of a

Table of Contents

majority in aggregate principal amount of outstanding debt securities of such series may rescind and annul such acceleration if:

all events of default (other than nonpayment of accelerated principal, premium or interest) have been cured or waived;

all lawful interest on overdue interest and overdue principal has been paid; and

the rescission would not conflict with any judgment or decree.

In addition, if the acceleration occurs at any time when we have outstanding indebtedness which is senior to the debt securities, the payment of the principal amount of outstanding debt securities may be subordinated in right of payment to the prior payment of any amounts due under the senior indebtedness, in which case the holders of debt securities will be entitled to payment under the terms prescribed in the instruments evidencing the senior indebtedness and the indenture.

If an event of default resulting from certain events of bankruptcy, insolvency or reorganization occurs, the principal, premium and interest amount with respect to all of the debt securities of any series will be due and payable immediately without any declaration or other act on the part of the trustee or the holders of the debt securities of that series.

The holders of a majority in principal amount of the outstanding debt securities of a series will have the right to waive any existing default or compliance with any provision of the indenture or the debt securities of that series and to direct the time, method and place of conducting any proceeding for any remedy available to the trustee, subject to certain limitations specified in the indenture.

No holder of any debt security of a series will have any right to institute any proceeding with respect to the indenture or for any remedy under the indenture, unless:

the holder gives to the trustee written notice of a continuing event of default;

the holders of at least 25% in aggregate principal amount of the outstanding debt securities of the affected series make a written request and offer reasonable indemnity to the trustee to institute a proceeding as trustee;

the trustee fails to institute a proceeding within 60 days after such request; and

the holders of a majority in aggregate principal amount of the outstanding debt securities of the affected series do not give the trustee a direction inconsistent with such request during such 60-day period.

These limitations do not, however, apply to a suit instituted for payment on debt securities of any series on or after the due dates expressed in the debt securities.

We will periodically deliver certificates to the trustee regarding our compliance with our obligations under the indenture.

Modification and Waiver

From time to time, we and the trustee may, without the consent of holders of the debt securities of one or more series, amend the indenture or the debt securities of one or more series, or supplement the indenture, for certain specified purposes, including:

to provide that the surviving entity following a change of control of StemCells, Inc. permitted under the indenture will assume all of our obligations under the indenture and debt securities;

to provide for certificated debt securities in addition to uncertificated debt securities;

to comply with any requirements of the SEC under the Trust Indenture Act of 1939;

Table of Contents

to provide for the issuance of and establish the form and terms and conditions of debt securities of any series as permitted by the indenture;

to cure any ambiguity, defect or inconsistency, or make any other change that does not materially and adversely affect the rights of any holder; and

to appoint a successor trustee under the indenture with respect to one or more series.

From time to time we and the trustee may, with the consent of holders of at least a majority in principal amount of an outstanding series of debt securities, amend or supplement the indenture or the debt securities of such series, or waive compliance in a particular instance by us with any provision of the indenture or such debt securities. We may not, however, without the consent of each holder affected by such action, modify or supplement the indenture or the debt securities or waive compliance with any provision of the indenture or the debt securities in order to:

reduce the amount of debt securities whose holders must consent to an amendment, supplement, or waiver to the indenture or such debt security;

reduce the rate of or change the time for payment of interest or reduce amount of or postpone the date for payment of sinking fund or analogous obligations;

reduce the principal of or change the stated maturity of the debt securities;

make any debt security payable in money other than that stated in the debt security;

change the amount or time of any payment required or reduce the premium payable upon any redemption, or change the time before which no such redemption may be made;

waive a default in the payment of the principal of, premium, if any, or interest on the debt securities or a redemption payment;

waive a redemption payment with respect to any debt securities or change any provision with respect to redemption of debt securities; or

take any other action otherwise prohibited by the indenture to be taken without the consent of each holder affected by the action.

Defeasance of Debt Securities and Certain Covenants in Certain Circumstances

The indenture permits us, at any time, to elect to discharge our obligations with respect to one or more series of debt securities by following certain procedures described in the indenture. These procedures will allow us either:

to defease and be discharged from any and all of our obligations with respect to any debt securities except for the following obligations (which discharge is referred to as legal defeasance):

- (1) to register the transfer or exchange of such debt securities;
- (2) to replace temporary or mutilated, destroyed, lost or stolen debt securities;
- (3) to compensate and indemnify the trustee; or
- (4) to maintain an office or agency in respect of the debt securities and to hold monies for payment in

trust; or

to be released from our obligations with respect to the debt securities under certain covenants contained in the indenture, as well as any additional covenants which may be contained in the applicable supplemental indenture (which release is referred to as covenant defeasance).

In order to exercise either defeasance option, we must deposit with the trustee or other qualifying trustee, in trust for that purpose:

money;

Table of Contents

U.S. Government Obligations (as described below) or Foreign Government Obligations (as described below) which through the scheduled payment of principal and interest in accordance with their terms will provide money; or

a combination of money and/or U.S. Government Obligations and/or Foreign Government Obligations sufficient, in the written opinion of a nationally-recognized firm of independent accountants, to provide money; which in each case specified above, provides a sufficient amount to pay the principal of, premium, if any, and interest, if any, on the debt securities of the series, on the scheduled due dates or on a selected date of redemption in accordance with the terms of the indenture.

In addition, defeasance may be effected only if, among other things:

in the case of either legal or covenant defeasance, we deliver to the trustee an opinion of counsel, as specified in the indenture, stating that as a result of the defeasance neither the trust nor the trustee will be required to register as an investment company under the Investment Company Act of 1940;

in the case of legal defeasance, we deliver to the trustee an opinion of counsel stating that we have received from, or there has been published by, the Internal Revenue Service a ruling to the effect that, or there has been a change in any applicable federal income tax law with the effect that (and the opinion shall confirm that), the holders of outstanding debt securities will not recognize income, gain or loss for U.S. federal income tax purposes solely as a result of such legal defeasance and will be subject to U.S. federal income tax on the same amounts, in the same manner, including as a result of prepayment, and at the same times as would have been the case if legal defeasance had not occurred;

in the case of covenant defeasance, we deliver to the trustee an opinion of counsel to the effect that the holders of the outstanding debt securities will not recognize income, gain or loss for U.S. federal income tax purposes as a result of covenant defeasance and will be subject to U.S. federal income tax on the same amounts, in the same manner and at the same times as would have been the case if covenant defeasance had not occurred; and

certain other conditions described in the indenture are satisfied.

If we fail to comply with our remaining obligations under the indenture and applicable supplemental indenture after a covenant defeasance of the indenture and applicable supplemental indenture, and the debt securities are declared due and payable because of the occurrence of any undefeased event of default, the amount of money and/or U.S. Government Obligations and/or Foreign Government Obligations on deposit with the trustee could be insufficient to pay amounts due under the debt securities of the affected series at the time of acceleration. We will, however, remain liable in respect of these payments.

The term "U.S. Government Obligations" as used in the above discussion means securities which are direct obligations of or non-callable obligations guaranteed by the United States of America for the payment of which obligation or guarantee the full faith and credit of the United States of America is pledged.

The term "Foreign Government Obligations" as used in the above discussion means, with respect to debt securities of any series that are denominated in a currency other than U.S. dollars (1) direct obligations of the government that issued or caused to be issued such currency for the payment of which obligations its full faith and credit is pledged or (2) obligations of a person controlled or supervised by or acting as an agent or instrumentality of such government the timely payment of which is unconditionally guaranteed as a full faith and credit obligation by that government, which in either case under clauses (1) or (2), are not callable or redeemable at the option of the issuer.

Regarding the Trustee

We will identify the trustee with respect to any series of debt securities in the prospectus supplement relating to the applicable debt securities. You should note that if the trustee becomes a creditor of StemCells, Inc., the indenture and the Trust Indenture Act of 1939 limit the rights of the trustee to obtain payment of claims in certain cases, or to

Table of Contents

realize on certain property received in respect of any such claim, as security or otherwise. The trustee and its affiliates may engage in, and will be permitted to continue to engage in, other transactions with us and our affiliates. If, however, the trustee acquires any conflicting interest within the meaning of the Trust Indenture Act of 1939, it must eliminate such conflict or resign.

The holders of a majority in principal amount of the then outstanding debt securities of any series may direct the time, method and place of conducting any proceeding for exercising any remedy available to the trustee. If an event of default occurs and is continuing, the trustee, in the exercise of its rights and powers, must use the degree of care and skill of a prudent person in the conduct of his or her own affairs. Subject to that provision, the trustee will be under no obligation to exercise any of its rights or powers under the indenture at the request of any of the holders of the debt securities, unless they have offered to the trustee reasonable indemnity or security.

WHERE YOU CAN FIND MORE INFORMATION

We have filed a registration statement on Form S-3 with the SEC for the stock we are offering by this prospectus. This prospectus does not include all of the information contained in the registration statement. You should refer to the registration statement and its exhibits for additional information.

We are required to file annual and quarterly reports, special reports, proxy statements, and other information with the SEC. We make these documents publicly available, free of charge, on our website at www.stemcellsinc.com as soon as reasonably practicable after filing such documents with the SEC. You can read our SEC filings, including the registration statement, on the SEC's website at <http://www.sec.gov>. You also may read and copy any document we file with the SEC at its public reference facility at:

Public Reference Room
100 F Street N.E.
Washington, DC 20549.

Please call the SEC at 1-800-732-0330 for further information on the operation of the public reference facilities.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to incorporate by reference into this prospectus the information we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus, and information in documents that we file later with the SEC will automatically update and supersede information in this prospectus. We incorporate by reference the documents listed below into this prospectus, and any future filings made by us with the SEC under Section 13(a), 13(c), 14 or 15(d) of the Exchange Act until we close this offering, including all filings made after the date of the initial registration statement and prior to the effectiveness of the registration statement. We hereby incorporate by reference the following documents:

Our Annual Report on Form 10-K (as amended) for the year ended December 31, 2007 (File No. 000-19871);

Our Quarterly Report on Form 10-Q for the quarter ended March 31, 2008 (File No. 000-19871);

Our Current Reports on Form 8-K filed on March 5, 2008, March 21, 2008 and May 13, 2008 (File No. 000-19871);

The description of our common stock contained in our registration statements on Form 8-A (File No. 000-19871) filed August 3, 1998, under the Exchange Act, including any amendment or report filed for the purpose of updating such description; and

Our definitive Proxy Statement on Form DEF 14A filed on June 9, 2008 (File No. 000-19871).

Table of Contents

You may request a copy of these filings, at no cost, by writing or telephoning us at the following address:

StemCells, Inc.
3155 Porter Drive
Palo Alto, Ca 94304
Attention: Investor Relations
Phone: (650) 475-3100
email: irpr@stemcellsinc.com

Copies of these filings are also available, without charge, on our Internet website at www.stemcellsinc.com as soon as reasonably practicable after they are filed electronically with the SEC. The information contained on our website is not a part of this prospectus.

LEGAL MATTERS

The validity of the issuance of the securities offered hereby will be passed upon for us by Ropes & Gray LLP, Boston, Massachusetts. The validity of any securities will be passed upon for any underwriters or agents by counsel that we will name in the applicable prospectus supplement.

EXPERTS

The consolidated financial statements and management's assessment of the effectiveness of internal control over financial reporting have been incorporated by reference herein and in the registration statement in reliance upon the reports of Grant Thornton LLP, independent registered public accountants (which reports expressed an unqualified opinion and contain an explanatory paragraph relating to the adoption of Statement of Financial Accounting Standards No. 123(R), *Share-Based Payment*) upon the authority of said firm as experts in accounting and auditing.

Table of Contents

**\$100,000,000
StemCells, Inc.
Common Stock
Preferred Stock
Warrants
Debt Securities
PROSPECTUS
July 18, 2008**

We have not authorized any dealer, salesperson or other person to give any information or represent anything not contained in this prospectus. You must not rely on any unauthorized information. If anyone provides you with different or inconsistent information, you should not rely on it. This prospectus does not offer to sell any shares in any jurisdiction where it is unlawful. Neither the delivery of this prospectus, nor any sale made hereunder, shall create any implication that the information in this prospectus is correct after the date hereof.

Table of Contents