

BSD MEDICAL CORP
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Registration No. 333-162080

Prospectus Supplement
(To Prospectus Dated October 1, 2009)

BSD MEDICAL CORPORATION
1,225,000 SHARES OF COMMON STOCK
WARRANTS TO PURCHASE 918,750 SHARES OF COMMON STOCK
918,750 SHARES OF COMMON STOCK ISSUABLE UPON EXERCISE OF THE WARRANTS

We are offering directly to selected investors up to 1,225,000 shares of our common stock and warrants to purchase up to 918,750 shares of our common stock (including 918,750 shares of common stock issuable upon exercise of the warrants) pursuant to this prospectus supplement and the accompanying prospectus. Of the 2,143,750 shares of common stock offered hereby, 918,750 shares are issuable upon exercise of the warrants. The securities will be sold in multiples of a fixed combination consisting of one share of common stock and a warrant to purchase 0.75 shares of common stock, at an initial exercise price of \$3.27. Each fixed combination will be sold at a negotiated price of \$2.25 per fixed combination. The warrants will be exercisable on or after the date that is six months and one day after the date the warrants are issued and will expire on the fifth anniversary of the date the warrants become exercisable.

For a more detailed description of the common stock and warrants, see the section entitled “Description of Securities We Are Offering” beginning on page S-12.

Our common stock is traded on The NASDAQ Global Market under the symbol “BSDM”. On August 18, 2010, the last reported sale price for our common stock was \$2.97 per share. There is no established public trading market for the warrants, and we do not expect a market to develop. We do not intend to apply to list the warrants on any securities exchange.

As of August 18, 2010, the aggregate market value of our outstanding common equity held by non-affiliates was approximately \$48,840,014 based on 16,444,449 shares of outstanding common stock held by non-affiliates and a price of \$2.97 per share, which was the last reported sale price of our common stock on The Nasdaq Global Market on August 18, 2010. Within the prior 12 calendar month period that ends on, and includes the date of this prospectus supplement, we have sold securities in the amount of \$10,784,244 pursuant to General Instruction I.B.6. of Form S-3. The value of the securities offered hereby is \$5,484,938.

We have retained Roth Capital Partners LLC as our exclusive placement agent in connection with this offering. The placement agent has no obligation to buy any of the securities from us or to arrange for the purchase or sale of any specific number or dollar amount of securities. See “Plan of Distribution” beginning on page S-13 of this prospectus supplement for more information regarding these arrangements.

Investing in our securities involves a high degree of risk. See “Risk Factors” beginning on page S-3 of this prospectus supplement and “Risk Factors” beginning on page 4 of the accompanying prospectus.

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

| | Per Fixed Combination of one share of common stock and one warrant to purchase 0.75 shares of common stock | | Total |
|----------------------------------|--|------|--------------|
| Public Offering Price | \$ | 2.25 | \$ 2,756,250 |
| Placement agency fees | \$ | .15 | \$ 179,156 |
| Proceeds, before expenses, to us | \$ | 2.10 | \$ 2,577,094 |

Roth Capital Partners, LLC is acting as the exclusive placement agent in this offering. We estimate the total expenses of this offering, excluding the placement agency fees, will be approximately \$65,000. Because there is no minimum offering amount, the actual offering amount, the placement agency fees and net proceeds to us, if any, in this offering may be substantially less than the total offering amounts set forth above. We are not required to sell any specific number or dollar amount of the securities offered in this offering, but the placement agent will use its reasonable efforts to arrange for the sale of all of the securities offered.

Delivery of the securities will be made on or before August 24, 2010.

Roth Capital Partners

The date of this prospectus supplement is August 19, 2010

TABLE OF CONTENTS

Prospectus Supplement

| | |
|---|------|
| ABOUT THIS PROSPECTUS SUPPLEMENT | S-1 |
| PROSPECTUS SUPPLEMENT SUMMARY | S-1 |
| RISK FACTORS | S-3 |
| SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS | S-10 |
| USE OF PROCEEDS | S-10 |
| DILUTION | S-11 |
| DESCRIPTION OF SECURITIES WE ARE OFFERING | S-12 |
| PLAN OF DISTRIBUTION | S-13 |
| LEGAL MATTERS | S-15 |
| EXPERTS | S-15 |
| WHERE YOU CAN FIND MORE INFORMATION | S-15 |
| INCORPORATION BY REFERENCE | S-16 |

Prospectus

| | |
|---|----|
| ABOUT THIS PROSPECTUS | 1 |
| SUMMARY | 1 |
| RISK FACTORS | 4 |
| SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS | 4 |
| USE OF PROCEEDS | 5 |
| DESCRIPTION OF CAPITAL STOCK | 5 |
| DESCRIPTION OF DEBT SECURITIES | 9 |
| DESCRIPTION OF WARRANTS | 10 |
| DESCRIPTION OF UNITS | 11 |
| PLAN OF DISTRIBUTION | 12 |
| LEGAL MATTERS | 14 |
| EXPERTS | 15 |
| WHERE YOU CAN FIND MORE INFORMATION | 15 |
| INCORPORATION BY REFERENCE | 15 |

ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying prospectus are part of a “shelf” registration statement on Form S-3, registration statement number 333-162080, that we filed with the Securities and Exchange Commission (the SEC) on September 23, 2009 and that was declared effective on October 1, 2009. Under this shelf registration process, we may offer and sell from time to time in one or more offerings the securities described in the accompanying prospectus. This prospectus supplement describes the specific details regarding this offering, including the price, the amount of our common stock and warrants being offered, the risks of investing in our common stock, warrants and other items.

This document is in two parts. The first part is this prospectus supplement, which describes the terms of this offering of our common stock and warrants and also adds, updates, and changes information contained in the accompanying prospectus and the documents incorporated by reference. The second part is the accompanying prospectus, which gives more general information, some of which may not apply to this offering. Generally, when we refer to this “prospectus,” we are referring to both documents combined. To the extent the information contained in this prospectus supplement differs or varies from the information contained in the accompanying prospectus or any document filed prior to the date of this prospectus supplement and incorporated by reference, the information in this prospectus supplement will control.

You should rely only on the information contained in this prospectus supplement and the accompanying prospectus, including any information incorporated by reference. We have not authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. You should not assume that the information appearing in this prospectus, any prospectus supplement or any document incorporated by reference is accurate at any date other than as of the date of each such document. Our business, financial condition, results of operations and prospects may have changed since the date indicated on the cover page of such documents.

References in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference to “we,” “our,” “us,” “BSD” and “the Company” refer to BSD Medical Corporation. Both this prospectus supplement and the accompanying prospectus include important information about us, our common stock and other information you should know before investing. This prospectus supplement also adds, updates, and changes certain of the information contained in the prospectus. You should read both this prospectus supplement and the accompanying prospectus as well as the additional information described under the headings “Where You Can Find More Information” and “Incorporation by Reference” before investing in our common stock and warrants.

This prospectus supplement contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus supplement is a part, and you may obtain copies of those documents as described below under the heading “Where You Can Find More Information.”

PROSPECTUS SUPPLEMENT SUMMARY

This summary is not complete and does not contain all of the information that you should consider before investing in the securities offered by this prospectus. You should read this summary together with the entire prospectus supplement and prospectus, including our financial statements, the notes to those financial statements and the additional information described in this prospectus supplement under the headings “Where You Can Find More Information” on page S-15 and “Incorporation by Reference” on page S-16, before making an investment decision. See

the “Risk Factors” section of this prospectus supplement beginning on page S-3 for a discussion of the risks involved in investing in our securities.

Summary of Our Business

We develop, manufacture, market and service medical systems that deliver precision-focused radio frequency (RF) or microwave energy into diseased sites of the body, heating them to specified temperatures as required by a variety of medical therapies. Our business objectives are to commercialize our products developed for the treatment of cancer and to further expand our systems to treat other diseases and medical conditions. Our product line for cancer therapy has been created to offer hospitals and clinics a complete solution for thermal treatment for cancer provided through microwave/RF systems.

S-1

While our primary developments to date have been cancer treatment systems, we also pioneered the use of microwave thermal therapy for the treatment of symptoms associated with enlarged prostate, and we are responsible for technology that has contributed to a new medical industry addressing the needs of men's health. In accordance with our strategic plan, we subsequently sold our interest in TherMatrix, Inc., the company established to commercialize our technology to treat enlarged prostate symptoms, to provide substantial funding that we can utilize for commercializing our systems used in the treatment of cancer and in achieving other business objectives.

Our product line includes systems that have been strategically designed to offer a range of thermal treatment systems for the treatment of cancer, including both hyperthermia and ablation treatment systems. Studies have shown that both hyperthermia and ablation treatments kill cancer but they have different clinical applications.

Our hyperthermia cancer treatment systems are used to treat cancer with heat (hyperthermia) while boosting the effectiveness of radiation through a number of biological mechanisms. Hyperthermia is usually used to increase the effectiveness of other therapies; e.g., radiation therapy and chemotherapy for the treatment of locally advanced cancers. Hyperthermia usually refers to treatments delivered at temperatures of 40-49°C for one hour.

Our microwave ablation system is to be used to ablate (remove or vaporize) soft tissue with heat alone. Thermal ablation usually refers to heat treatments delivered at temperatures above 55°C for short periods of time. Thermal ablation is used to destroy local tumors using a short intense focus of heat on a specific area, which is usually small, similar to surgical removal of the tumor.

Our primary mission is to develop the full spectrum of medical uses for our special competence in precision-focused RF/microwave systems, and to broadly apply the utilization of our technology to treat cancer and benign diseases and conditions.

Our principal executive offices are located at 2188 West 2200 South, Salt Lake City, Utah 84101, and our telephone number is (801) 972-5555.

On April 22, 2008, we changed the listing of our stock from the American Stock Exchange (AMEX) to the NASDAQ Stock Market (NASDAQ), and our stock now trades under the NASDAQ symbol "BSDM."

The Offering

Common stock offered by us 1,225,000 shares

Common Stock outstanding after 26,178,679 shares
this offering (assuming no
exercise of the warrants offered
by us)

Warrants offered by us Warrants to purchase up to 918,750 shares of common stock. Each warrant may be exercised at any time on or after the date that is six months and one day after the date the warrants are issued until the fifth anniversary of the date the warrants become exercisable at an initial exercise price of \$3.27 per share of common stock, subject to adjustment. This prospectus 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 from this offering for continuing product development, sales and marketing and general corporate purposes, subject to certain restrictions we have agreed to in the purchase agreement with the investors in this offering. See “Use of Proceeds” on page S-10. |
| Market for the common stock and warrants | Our common stock is quoted and traded on the NASDAQ Global Market under the symbol “BSDM.” However, there is no established public trading market for the offered warrants, and we do not expect a market to develop. In addition, we do not intend to apply to list the warrants on any securities exchange. |
| Risk Factors | You should read the “Risk Factors” section of this prospectus supplement and in the documents incorporated by reference in this prospectus supplement for a discussion of factors to consider before deciding to purchase our securities. |
| NASDAQ Global Market Symbol | BSDM |

The number of shares of common stock to be outstanding after this offering as reflected in the table above is based on the actual number of shares outstanding as of August 18, 2010, which was 24,953,679, and does not include, as of that date:

- 573,825 shares of our common stock issuable upon the exercise of outstanding stock options under our Fourth Amended and Restated 1998 Director Stock Plan, having a weighted average exercise price of \$5.18 per share;
- 486,952 shares of our common stock reserved for future issuance under our Fourth Amended and Restated 1998 Director Stock Plan;
- 1,650,461 shares of our common stock issuable upon the exercise of outstanding stock options under our Third Amended and Restated 1998 Stock Incentive Plan, having a weighted average exercise price of \$2.52 per share;
- 3,221,996 shares of our common stock reserved for future issuance under our Third Amended and Restated 1998 Stock Incentive Plan;
- 882,354 shares of our common stock issuable upon the exercise of warrants, at an exercise price of \$2.04 per share;
- 1,233,553 shares of our common stock issuable upon the exercise of warrants, at an exercise price of \$1.94 per share; and
- 918,750 shares of common stock issuable upon the exercise of warrants to be issued in this offering, at an exercise price of \$3.27 per share.

Unless otherwise stated, outstanding share information throughout this prospectus supplement excludes such outstanding options and warrants to purchase shares of common stock and shares available for issuance.

RISK FACTORS

Before you make a decision to invest in our securities, you should consider carefully the risks described below, together with other information in this prospectus supplement, the accompanying prospectus and the information incorporated by reference herein and therein. If any of the following events actually occur, our business, operating results, prospects or financial condition could be materially and adversely affected. This could cause the trading price of our common stock to decline and you may lose all or part of your investment. The risks described below are not the only ones that we face. Additional risks not presently known to us or that we currently deem immaterial may also significantly impair our business operations and could result in a complete loss of your investment.

RISKS RELATED TO THIS OFFERING

Since we have broad discretion in how we use the proceeds from this offering, we may use the proceeds in ways with which you disagree.

We have not allocated specific amounts of the net proceeds from this offering for any specific purpose. Accordingly, subject to the agreed upon contractual restrictions under the terms of the purchase agreement (as described below under "Use of Proceeds"), our management will have significant flexibility in applying the net proceeds of this offering. You will be relying on the judgment of our management with regard to the use of these net proceeds, and subject to any agreed upon contractual restrictions under the terms of the purchase agreement, you will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. It is possible that the net proceeds will be invested in a way that does not yield a favorable, or any, return for us. The

failure of our management to use such funds effectively could have a material adverse effect on our business, financial condition, operating results and cash flow.

S-3

There is no minimum offering amount required to consummate this offering.

There is no minimum offering amount which must be raised in order for us to consummate this offering. Accordingly, the amount of money raised may not be sufficient for us to meet our business objectives. Moreover, if only a small amount of money is raised, all or substantially all of the offering proceeds may be applied to cover the offering expenses and we will not otherwise benefit from the offering. In addition, because there is no minimum offering amount required, investors will not be entitled to a return of their investment if we are unable to raise sufficient proceeds to meet our business objectives.

You will experience immediate dilution in the book value per share of the common stock you purchase.

Because the price per share of our common stock being offered is substantially higher than the book value per share of our common stock, you will suffer substantial dilution in the net tangible book value of the common stock you purchase in this offering. After giving effect to the sale by us of 1,225,000 shares of common stock in this offering, and based on a public offering price of \$2.25 per fixed combination in this offering and a pro forma net tangible book value per share of our common stock of \$0.50 as of May 31, 2010, without giving effect to the potential exercise of the warrants being offered by this prospectus supplement, if you purchase securities in this offering, you will suffer immediate and substantial dilution of \$1.75 per share in the net tangible book value of the common stock purchased. See "Dilution" on page S-11 for a more detailed discussion of the dilution you will incur in connection with this offering.

There is no public market for the warrants to purchase common stock in this offering.

There is no established public trading market for the warrants being offered in this offering, and we do not expect a market to develop. In addition, we do not intend to apply to list the warrants on any securities exchange. Without an active market, the liquidity of the warrants will be limited.

RISKS RELATED TO OUR COMPANY

We have a history of significant operating losses and such losses may continue in the future.

Since our inception in 1978, our expenses have substantially exceeded our revenue, resulting in continuing losses and an accumulated deficit of \$22,928,417 at May 31, 2010. We reported net losses of \$11,384,870, \$2,439,099 and \$3,348,195 in fiscal years 2009, 2008 and 2007, respectively.

We may continue to incur operating losses in the future as we continue to incur costs to develop our products, protect our intellectual property and expand our sales and marketing activities. To become profitable we will need to increase significantly the revenues we receive from sales of our hyperthermia therapy products and to successfully commercialize our new ablation product to improve our profitability on a quarterly or annual basis. We have been unable to do this in the past and we may be unable to do so in the future, and therefore may never achieve profitability.

Adverse worldwide economic conditions have made it difficult for our customers to obtain approval for the purchase of and funding for our hyperthermia systems.

Our hyperthermia cancer treatment systems represent capital equipment purchases for our customers. Adverse worldwide economic conditions have made it difficult for our customers to obtain approval for the purchase of and funding for our hyperthermia systems. This has contributed to a lack of growth in our worldwide sales of our systems. To the extent that adverse economic conditions continue, we believe our sales of hyperthermia systems will

continue to be negatively impacted and possibly decrease in fiscal year 2010 as compared to fiscal year 2009.

S-4

Our revenues can fluctuate significantly from period to period because our sales, to date have been based upon a relatively small number of systems, the sales price of each being substantial enough to greatly impact revenue levels in the periods in which they occur.

Our revenues can fluctuate significantly from period to period because our sales, to date, have been based upon a relatively small number of hyperthermia systems, the sales price of each being substantial enough to greatly impact revenue levels in the periods in which they occur. Sales of a few systems, particularly BSD-2000/3D/MR systems, can cause a large change in our revenues from period to period and the sales cycle for our systems generally extends over multiple financial reporting periods. In addition, differences in the configuration of the systems sold, pricing, and other factors can result in significant differences in the sales price per system and in the total revenues reported in a given period. As a result, there may be quarterly financial reporting periods where we may report no or minimal revenues from the sale of hyperthermia systems.

A significant portion of our revenues have been from related parties, and we have had significant concentrations of revenues in foreign countries.

During the years ended August 31, 2009, 2008, and 2007, we had sales of \$603,000, \$2,809,132 and \$1,385,332, respectively, to entities controlled by a significant stockholder and member of the Board of Directors. These related party transactions represent 17%, 55% and 49% of total sales for each respective year.

A significant portion of our revenues are derived from sales to foreign customers. During the years ended August 31, 2009, 2008 and 2007, export sales totaled \$1,668,547, \$2,812,796 and \$1,787,363, or 47%, 55% and 63% of total sales, respectively. During fiscal year 2009, export sales to China, Switzerland and Poland were approximately 16%, 13% and 14% of total sales, respectively. During fiscal years 2008 and 2007, export sales to Switzerland were approximately 53% and 44% of total sales, respectively.

To the extent that we are unable to maintain or increase the level of our revenues derived from related parties or foreign customers, the results of our operations could be negatively impacted.

Our hyperthermia therapy products may not achieve market acceptance which could limit our future revenue and ability to achieve profitability.

To date, hyperthermia therapy has not gained wide acceptance by cancer-treating physicians. We believe this is due in part to the lingering impression created by the inability of early hyperthermia therapy technologies to focus and control heat directed at specific tissue locations and conclusions drawn in early scientific studies that hyperthermia was only marginally effective. Additionally, market acceptance depends upon physicians and hospitals obtaining adequate reimbursement rates from third-party payors to make our products commercially viable, and we believe that reimbursement rates have not been adequate to stimulate strong interest in adopting hyperthermia as a new cancer therapy. If our sales and marketing efforts to promote hyperthermia therapy acceptance in the medical community fail, or our efforts to improve third-party reimbursement rates for hyperthermia therapy are not successful, then our future revenue from sales of our products may be limited, and we may never be able to obtain profitable recurring operations.

We have delayed market introduction of our MTX-180 ablation product and are unable to predict when design modification, marketing and sales strategies will be completed.

Our MTX-180 Microwave Ablation System represents a major part of our business plan moving forward. The FDA granted us a 510(k) clearance to market the MTX-100, which authorizes the commercial sale of the device in the United States. Since receipt of FDA clearance to market the MTX-100, we have devoted significant efforts to

optimizing the design of the system to improve its ease of use and its medical applications. Following clinical evaluations of Phase I, we decided to postpone market entry until completion of the optimized Phase II design, the MTX-180. We believe this will allow us to enter this market with an optimized system that will have a wider range of clinical applications and increased revenue streams.

On August 18, 2010, we announced that the FDA granted us a 510(k) clearance to market the MTX-180, which authorizes the commercial sale of the device in the United States. Additional time will be required to finalize the manufacturing processes for the MTX-180 and the applicators. Also, final marketing and sales strategies must be completed prior to market introduction. We currently are unable to predict when these efforts will be completed and when revenues from the sale of the MTX-180 and related applicators will begin. We do not believe, however, that these revenues will begin earlier than the fourth quarter of calendar year 2010, and we cannot be sure that these revenues will be consistent with our predictions. We cannot be assured that our efforts to commercialize the MTX-180 will be successful. If our efforts to commercialize the MTX-180 are not successful, our business will be adversely affected.

S-5

Sales of our product could be significantly reduced if government, private health insurers and other third-party payors do not provide sufficient coverage or reimbursement.

Our success in selling our products will depend in large part on the extent to which reimbursement for the costs of our products and related treatments are available from government health agencies, private health insurers and other third-party payers. Despite the existence of general reimbursement policies, local medical review policies may differ for public and private insurance payers, which may cause payment to be refused for some hyperthermia treatments. Private payers also may refuse to pay for hyperthermia treatments.

Medical reimbursement rates are unpredictable and we cannot predict the extent to which our business may be affected by future legislative and regulatory developments. Future health care legislation or regulation may limit our business or impose additional delays and costs on our business and third-party reimbursement may not be adequate to cover our costs associated with producing and selling our products.

Cancer therapy is subject to rapid technological change and therapies that are more effective than ours could render our technology obsolete.

The treatment of cancer is currently subject to extensive research and development. Many cancer therapies are being researched and our products may be rendered obsolete by existing therapies and as a result of therapy innovations by others. If our products are rendered obsolete, our revenue will decline, we may never achieve profitability, and we may not be able to continue in business.

Additionally, other companies, particularly established companies that currently manufacture and sell other cancer therapy systems, could potentially become competitors (in that they are also engaged in cancer treatment business), and they have significantly greater resources than we do.

Some of the medical institutions to which we have sold in the past have not been able to pay for their equipment, and some of our sales have therefore become substantial bad debts, a risk that could continue into the future.

A limited number of our customers have been developing clinics, and these customers have been particularly vulnerable to financial difficulties that can cause them to be unable to pay for equipment that they have purchased. If we choose to accept higher risk sales opportunities to clinics in the future, we will be subject to these customer credit risks that could lower future net sales due to bad-debt write offs, resulting in losses in future periods and potentially lowering the value of our stock. While we attempt to provide for foreseeable doubtful accounts, we cannot assure that this provision will always be adequate to cover our credit risks.

Increasing sales of our hyperthermia systems depends on our ability to successfully expand our sales distribution channels; however, we have had failures with the productivity of new channels of distribution in the past. Expanding our channels of distribution will also significantly increase our sales expenses, which could negatively impact our financial performance.

We believe that the success of our efforts to increase sales of our hyperthermia systems in the future depends on our ability to successfully expand our sales distribution channels. Historically, we have sometimes failed in establishing successful new sales channels.

We anticipate that the success of our multi-year plan for selling hyperthermia systems will require expanding our sales and marketing organization through a combination of direct sales people, distributors and internal and external marketing expertise. However, as we pursue our marketing plan, there can be no assurance that we will be successful in securing reliable channels of distribution to meet our plan through expanded sales. Recruiting and training new

distribution channels can take time and considerable expense. We project that sales and marketing expenses will increase substantially in the future as compared to past years. This added expense could have an adverse effect on our future financial performance that is greater than any potential increases in sales.

S-6

In addition, there can be no assurance that our channels of distribution that have been successful in the past will be successful in the future. We have derived a significant portion of our revenue from sales in Europe and in China. Sales in Europe were made through our distributor Medizin-Technik, GmbH, which also purchases equipment components and parts from us. Medizin-Technik is controlled by Dr. Sennewald, one of our directors. The loss or ineffectiveness of either Medizin-Technik or our Chinese distributor as a distributor and significant customer could result in lower revenue.

We may face significant uncertainty in the industry due to government healthcare reform.

In March 2010, Congress passed sweeping healthcare reform in the Patient Protection and Affordable Care Act. We have not been able to assess the impact of the legislation on the Company, but it could result in new taxes on revenues for medical device companies and impact the utilization and reimbursement of our products. Our results of operations, our financial position and cash flows could be materially adversely affected by changes under the new legislation or under any federal or state healthcare legislation adopted in the future.

We are subject to government regulations that can delay our ability to sell our products and cause us to incur substantial expenses.

Our research and development efforts, pre-clinical tests and clinical trials, and the manufacturing, marketing, distribution and labeling of our products are subject to extensive regulation by the FDA and comparable international agencies. The process of obtaining FDA and other required regulatory approvals is lengthy and expensive and our financial resources are limited.

Obtaining pre-market approval or marketing clearance as a 510(k) submission from the FDA is necessary for us to commercially market our systems in the United States. Obtaining approvals is a lengthy and expensive process. We may not be able to obtain these approvals on a timely basis, if at all, and such failure could harm our business prospects substantially. Further, even if we are able to obtain the approvals we seek from the FDA, the approvals granted might include significant limitations on the indicated uses for which the products may be marketed, which restrictions could negatively impact our business. We are unable to predict when the review process will be completed and its ultimate outcome. If we are unable to receive HDE marketing approval, or if the FDA requires us to undergo extensive testing in order to grant HDE marketing approval, our business could be adversely affected.

After a product is approved for commercial distribution by the FDA, we have ongoing responsibilities under the Federal Food, Drug, and Cosmetic Act and FDA regulations, including regulation of our manufacturing facilities and processes, labeling and record-keeping, and reporting of adverse experiences and other information. Failure to comply with these ongoing requirements could result in the FDA imposing operating restrictions on us, enjoining or restraining certain violations, or imposing civil or criminal penalties on us.

All of these laws are subject to evolving interpretations. If the federal government were to conclude that we are not in compliance with any of these health care laws, we could be subject to substantial criminal and civil penalties, and could be excluded from participation as a supplier to beneficiaries in federal health care programs.

We depend on adequate protection of our patent and other intellectual property rights to stay competitive.

We rely on patents, trade secrets, trademarks, copyrights, know-how, license agreements and contractual provisions to establish and protect our intellectual property rights. Our success will substantially depend on our ability to protect our intellectual property rights and maintain rights granted to us through license agreements. Our intellectual property rights may only afford us limited protection and may not adequately protect our rights or remedies to gain or keep any advantages we may have over our competitors, which could reduce our ability to be competitive and generate sales

and profitability.

S-7

In the past, we have participated in substantial litigation regarding our patent and other intellectual property rights in the medical device industry. We have previously filed lawsuits for patent infringement against three of our competitors and subsequently settled all three of those lawsuits. Additional litigation against other parties may be necessary in the future to enforce our intellectual property rights, to protect our patents and trade secrets, and to determine the validity and scope of our proprietary rights. This litigation may require more financial resources than are available to us. We cannot guarantee that we will be able to successfully protect our rights in litigation. Failure to successfully protect our rights in litigation could reduce our ability to be competitive and generate sales and profitability.

A product liability settlement could exceed our ability to pay.

The manufacturing and marketing of medical devices involves an inherent risk of product liability. We presently carry product liability insurance with coverage limits of \$3 million. Our product liability insurance does not cover certain liabilities, including without limitation, intended or expected injury, injury of our own employee, injury or damage due to war, damage to property that we own, damage to our work, certain contractual liabilities, product recalls, patent infringements, pollution claims, or injury or damage resulting from asbestos inhalation. We are responsible to pay the first \$10,000 resulting from any claim up to a maximum of \$50,000 in one year. We cannot assure that our product liability insurance will provide adequate coverage against potential claims that might be made against us. If we were to be subject to a claim in excess of our coverage or to a claim not covered by our insurance and the claim succeeded, we would be required to pay the claim from our limited resources, which would reduce our limited capital resources and liquidity and reduce capital we could otherwise use to obtain approvals for and market our products. In addition, liability or alleged liability could harm our business by diverting the attention and resources of our management and by damaging our reputation.

We are dependent upon key personnel, some of whom would be difficult to replace.

Our success will be largely dependent upon the efforts of Harold R. Wolcott, our President, Paul F. Turner, our Senior Vice President and Chief Technology Officer, and Dixie T. Sells, our Vice President of Regulatory Affairs, and other key employees. We do not maintain key-person insurance on any of these employees. Our future success also will depend in large part upon our ability to identify, attract and retain other highly qualified managerial, technical and sales and marketing personnel. Competition for these individuals is intense. The loss of the services of any of our key personnel, the inability to identify, attract or retain qualified personnel in the future or delays in hiring qualified personnel could make it more difficult for us to manage our business and meet key objectives such as the sale of our products and the introduction of new products.

The market for our stock is limited and our stock price may be volatile.

The market for our common stock has been limited due to low trading volume and the small number of brokerage firms acting as market makers. Because of the limitations of our market and volatility of the market price of our stock, investors may face difficulties in selling shares at attractive prices when they want to. The average daily trading volume for our stock has varied significantly from week to week and from month to month, and the trading volume often varies widely from day to day. The following factors could impact the market for our stock and cause further volatility in our stock price:

· announcements of new technological innovations;

· FDA and other regulatory developments;

· changes in third-party reimbursements;

- developments concerning proprietary rights;
- third parties receiving FDA approval for competing products; and
- market conditions generally for medical and technology stocks.

S-8

Our directors and executive officers own a substantial number of shares of our capital stock, which could discourage or prevent a takeover, even if an acquisition would be beneficial to our stockholders.

Our directors and executive officers own approximately 34% of our outstanding voting power. Accordingly, these stockholders, individually and as a group, may be able to influence the outcome of stockholder votes involving the election of directors, the adoption or amendment of provisions in our certificate of incorporation and bylaws and the approval of certain mergers or other similar transactions, such as a sale of substantially all of our assets. Such control by existing stockholders could have the effect of delaying, deferring or preventing a change in control of our company.

Future sales of shares of our securities may negatively affect our stock price.

We are unable to predict the effect, if any, that future sales of common stock, or the availability of our common stock for future sales, will have on the market price of our common shares from time to time. Sales of substantial amounts of our common stock (including shares issued upon the exercise of stock options or warrants), or the possibility of such sales, could adversely affect the market price of our common stock and also impair our ability to raise capital through an offering of our equity securities in the future. In the future, we may issue additional shares or warrants in connection with investments or for other purposes considered advisable by our Board of Directors. Any substantial sale of our common shares may have an adverse effect on the market price of our common shares.

In addition, as of May 31, 2010, there were 2,115,907 shares of common stock issuable upon exercise of outstanding warrants that are not yet exercisable, 1,245,744 shares of common stock issuable upon the exercise of outstanding and exercisable stock options, 1,126,876 shares of common stock issuable upon the exercise of outstanding stock options that are not yet exercisable and 3,708,948 additional shares available for grant under our 1998 Stock Incentive Plan and 1998 Director Stock Plan. The market price of the common shares may be depressed by the potential exercise of these options and warrants. The holders of these options and warrants are likely to exercise them when we would otherwise be able to obtain additional capital on more favorable terms than those provided by the options. Further, while the options and warrants are outstanding, we may be unable to obtain additional financing on favorable terms.

We currently also have the ability to offer and sell common stock, preferred stock, warrants, senior debt, subordinated debt or units under a currently effective universal shelf registration statement, of which this prospectus is a part. The shelf registration statement registered up to \$50 million. We have previously sold \$10,784,244 pursuant to the shelf registration statement. Sales of substantial amounts of shares of our common stock or other securities under our universal shelf registration statement could lower the market price of our common stock and impair our ability to raise capital.

Anti-takeover provisions in our certificate of incorporation may have a possible negative effect on our stock price.

Certain provisions of our certificate of incorporation and bylaws may make it more difficult for a third party to acquire, or discourage a third party from attempting to acquire, control of us. We have in place several anti-takeover measures that could discourage or prevent a takeover, even if an acquisition would be beneficial to our stockholders. The increased difficulties faced by a third party who wishes to acquire us could adversely affect our stock price.

We do not anticipate paying dividends in the foreseeable future.

Since inception, we have not paid any cash dividend on our common stock and do not anticipate paying such dividends in the foreseeable future. The payment of dividends is within the discretion of our Board of Directors and depends upon our earnings, capital requirements, financial condition and requirements, future prospects, restrictions in

future financing agreements, business conditions and other factors deemed relevant by the Board. We intend to retain earnings and cash resources, if any, to finance our operations and, therefore, it is highly unlikely we will pay cash dividends.

S-9

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus, and the documents incorporated by reference contain forward-looking statements. These are based on our management's current beliefs, expectations and assumptions about future events, conditions and results and on information currently available to us. Discussions containing these forward-looking statements may be found, among other places, in the Sections of this prospectus summary entitled "Prospectus Summary" and "Risk Factors." See also "Forward-Looking Statements" in the accompanying prospectus. 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 forward-looking statements include, but are not limited to, statements about our business, technologies, prospects, partners, customers, suppliers and regulatory strategies.

All statements, other than statements of historical fact, included or incorporated herein regarding our strategy, future operations, financial position, future revenues, projected costs, plans, prospects and objectives are forward-looking statements. In some cases, you can identify forward-looking statements by terms such as "anticipate," "believe," "could," "estimate," "expect," "intend," "may," "plan," "potential," "predict," "project," "should," "will," "would" and similar expressions. Forward-looking statements involve risks, uncertainties and other factors that may cause our actual results, performance, time frames or achievements to be materially different from any future results, performance, time frames or achievements expressed or implied by the forward-looking statements. Risks, uncertainties and other factors that might cause or contribute to such differences include, but are not limited to, those discussed in the Section entitled "Risk Factors" in our most recent Annual Report on Form 10-K and in our Quarterly Reports on Form 10-Q, as well as any amendments thereto filed with the SEC. Given these risks, uncertainties and other factors, many of which are beyond our control, you should not place undue reliance on these forward-looking statements.

In addition, past financial and/or operating performance is not necessarily a reliable indicator of future performance and you should not use our historical performance to anticipate results or future period trends. We can give no assurances that any of the events anticipated by the forward-looking statements will occur or, if any of them do, what impact they will have on our results of operations and financial condition. Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to revise any forward-looking statements to reflect events or developments occurring after the date of this prospectus, even if new information becomes available in the future.

USE OF PROCEEDS

We estimate that the net proceeds from the sale of the securities we are offering will be approximately \$2.5 million, assuming that we sell all of the securities we are offering, after deducting the placement agent's fees and estimated offering expenses payable by us. This amount does not include the proceeds that we may receive in connection with any exercise of the warrants issued in this offering.

The net proceeds from this offering will be used for continuing product development, sales and marketing, and general corporate purposes. In the purchase agreement we have entered into with the purchasers in this offering, we have agreed not to use the proceeds of this offering to satisfy any existing debt (other than ordinary course trade payables), to redeem any of our outstanding securities or to settle any outstanding litigation.

Although we have identified some potential uses of the net proceeds to be received upon completion of this offering, we cannot specify these uses with certainty. Subject to any agreed upon contractual restrictions under the terms of the purchase agreement, our management will have broad discretion in the application of the net proceeds from this offering and could use them for purposes other than those contemplated at the time of this offering. Our stockholders may not agree with the manner in which our management chooses to allocate and spend the net proceeds. Moreover,

our management may use the net proceeds for corporate purposes that may not result in our being profitable or increase our market value.

Until we use the net proceeds of this offering, we intend to invest the funds in short-term, investment grade, interest-bearing securities.

S-10

DILUTION

Purchasers of shares of our common stock in this offering will suffer an immediate and substantial dilution in net tangible book value per share. Net tangible book value per share is total tangible assets, reduced by total liabilities, divided by the total number of outstanding shares of common stock. Our net tangible book value as of May 31, 2010 was approximately \$10.5 million, or approximately \$0.42 per outstanding share of common stock.

After giving effect to the sale of the securities and the application of the net proceeds therefrom at a public offering price of \$2.25 per fixed combination of securities (and excluding shares of common stock issued and any proceeds received upon exercise of the warrants), our adjusted net tangible book value as of May 31, 2010 would have been approximately \$13.0 million, or approximately \$0.50 per share. This represents an immediate increase in net tangible book value of \$0.08 per share to our existing stockholders and an immediate dilution of \$1.75 per share to new investors. The following table illustrates this calculation on a per share basis, assuming that we sell all of the securities we are offering:

| | |
|--|--------|
| Public offering price per fixed combination | \$2.25 |
| Net tangible book value per share as of May 31, 2010 | \$0.42 |
| Increase in net tangible book value per share attributable to new investors | \$0.08 |
| Adjusted net tangible book value per share as of May 31, 2010 after giving effect to this offering | \$0.50 |
| Dilution per share to new investors | \$1.75 |

Investors that acquire additional shares of common stock through the exercise of the warrants offered hereby may experience additional dilution depending on our net tangible book value at the time of exercise.

The amounts above are based on 24,953,679 shares of common stock outstanding as of August 18, 2010, and assume no exercise of outstanding options or warrants since that date. The number of shares of common stock anticipated to be outstanding after this offering excludes:

- 573,825 shares of our common stock issuable upon the exercise of outstanding stock options under our Fourth Amended and Restated 1998 Director Stock Plan, having a weighted average exercise price of \$5.18 per share;
- 486,952 shares of our common stock reserved for future issuance under our Fourth Amended and Restated 1998 Director Stock Plan;
- 1,650,461 shares of our common stock issuable upon the exercise of outstanding stock options under our Third Amended and Restated 1998 Stock Incentive Plan, having a weighted average exercise price of \$2.52 per share;
- 3,221,996 shares of our common stock reserved for future issuance under our Third Amended and Restated 1998 Stock Incentive Plan;
- 882,354 shares of common stock issuable upon the exercise of warrants, at an exercise price of \$2.04 per share;
- 1,233,553 shares of our common stock issuable upon the exercise of warrants, at an exercise price of \$1.94 per share; and
- 918,750 shares of common stock issuable upon the exercise of warrants to be issued in this offering, at an exercise price of \$3.27 per share.

To the extent that any of our outstanding options or warrants are exercised, we grant additional options under our stock option plans or issue additional warrants, or we issue additional shares of common stock in the future, there may be further dilution to new investors.

S-11

DESCRIPTION OF SECURITIES WE ARE OFFERING

In this offering, we are offering a maximum of up to 1,225,000 shares of our common stock and warrants to purchase up to an additional 918,750 shares of our common stock, as well as 918,750 shares of common stock that are issuable upon exercise of the warrants. The securities will be sold in multiples of a fixed combination consisting of one share of common stock and a warrant to purchase 0.75 shares of common stock, at an initial exercise price of \$3.27. We are offering the fixed combination at a negotiated price of \$2.25 per fixed combination.

Common Stock

The following description of our common stock is a summary. It is not complete and is subject to and qualified in its entirety by our Amended and Restated Certificate of Incorporation and Bylaws, as amended, a copy of each of which has been incorporated as an exhibit to the registration statement of which this prospectus supplement forms a part.

As of the date of this prospectus supplement, our certificate of incorporation authorizes us to issue 40,000,000 shares of common stock, par value \$0.001 per share, and 10,000,000 shares of preferred stock, par value \$0.001 per share. As of August 18, 2010, 24,953,679 shares of common stock were outstanding and no shares of preferred stock were outstanding.

The material terms and provisions of our common stock are described under the caption “Description of Capital Stock” starting on page 5 of the accompanying prospectus.

Warrants

The material terms and provisions of the warrants being offered pursuant to this prospectus supplement and the accompanying prospectus are summarized below. The summary is subject to, and qualified in its entirety by, the form of warrant which will be provided to each purchaser in this offering and will be filed as an exhibit to a Current Report on Form 8-K with the SEC in connection with this offering.

Each purchaser will receive, for each fixed combination purchased, one share of our common stock and a warrant representing the right to purchase 0.75 shares of common stock at an initial exercise price of \$3.27 per share of common stock. The warrants will be exercisable on or after the date that is six months and one day after the date the warrants are issued and will terminate on the fifth anniversary of the date the warrants become exercisable. The exercise price and the number of shares for which each warrant may be exercised is subject to appropriate adjustment in the event of stock dividends, stock splits, reorganizations or similar events affecting our common stock and the exercise price of warrants held by a purchaser (or such purchaser’s direct or indirect transferee) is subject to appropriate adjustment in the event of cash dividends or other distributions to holders of shares of our common stock.

There is no established public trading market for the warrants, and we do not expect a market to develop. We do not intend to apply to list the warrants on any securities exchange. Without an active market, the liquidity of the warrants will be limited. In addition, in the event our common stock price does not exceed the per share exercise price of the warrants during the period when the warrants are exercisable, the warrants will not have any value.

Holders of the warrants may exercise their warrants to purchase shares of our common stock by delivering an exercise notice, appropriately completed and duly signed. Payment of the exercise price for the number of shares for which the warrant is being exercised is required to be delivered within one trading day after exercise of the warrant. In the event that the registration statement relating to the warrant shares is not effective, a holder of warrants will have the right to exercise its warrants for a net number of warrant shares pursuant to the cashless exercise procedures specified in the warrants. Warrants may be exercised in whole or in part, and any portion of a warrant not exercised prior to the

termination date shall be and become void and of no value. The absence of an effective registration statement or applicable exemption from registration does not alleviate our obligation to deliver common stock issuable upon exercise of a warrant.

Upon the holder's exercise of a warrant, we will issue the shares of common stock issuable upon exercise of the warrant within three trading days of our receipt of notice of exercise.

S-12

The shares of common stock issuable on exercise of the warrants will be, when issued in accordance with the warrants, duly and validly authorized, issued and fully paid and non-assessable. We will authorize and reserve at least that number of shares of common stock equal to the number of shares of common stock issuable upon exercise of all outstanding warrants.

If, at any time warrants are outstanding, we consummate any fundamental transaction, as described in the warrants and generally including any consolidation or merger into another corporation, the consummation of a transaction whereby another entity acquires more than 50% of our outstanding voting stock, or the sale of all or substantially all of our assets, the successor entity must assume in writing all of our obligations to the warrant holders.

Additionally, in the event of a fundamental transaction, each warrant holder will have the right to require us, or our successor, to repurchase its warrant for an amount of cash equal to the Black-Scholes value of the remaining unexercised portion of the warrant on the date of the consummation of such fundamental transaction.

The exercisability of the warrants may be limited in certain circumstances if, upon exercise, the holder or any of its affiliates would beneficially own more than 4.9% of our common stock.

THE HOLDER OF A WARRANT WILL NOT POSSESS ANY RIGHTS AS A STOCKHOLDER UNDER THAT WARRANT UNTIL THE HOLDER EXERCISES THE WARRANT. THE WARRANTS MAY BE TRANSFERRED INDEPENDENT OF THE COMMON STOCK WITH WHICH THEY WERE ISSUED, SUBJECT TO APPLICABLE LAWS.

PLAN OF DISTRIBUTION

Placement Agency Agreement and Securities Purchase Agreement

Roth Capital Partners, LLC, which we refer to as the placement agent, has agreed to act as the exclusive placement agent in connection with this offering subject to the terms and conditions of a placement agency agreement dated as of August 19, 2010. The placement agent is not purchasing or selling any securities offered by this prospectus supplement, nor is it required to arrange the purchase or sale of any specific number or dollar amount of securities, but it has agreed to use its reasonable efforts to arrange for the sale of all of the securities offered hereby. Therefore, we will enter into a securities purchase agreement directly with purchasers in connection with this offering.

The placement agent proposes to arrange for the sale to one or more purchasers of the securities offered pursuant to this prospectus supplement through a securities purchase agreement between the purchasers and us. We will enter into a securities purchase agreement with the purchasers pursuant to which we will sell to the purchasers 1,225,000 shares of our common stock, and warrants to purchase up to an additional 918,750 shares of our common stock, at a price of \$2.25 per fixed combination. Each fixed combination consists of one share of our common stock and a warrant to purchase 0.75 shares of our common stock at an initial exercise price of \$3.27 per share. We negotiated the price for the fixed combination offered in this offering with the purchasers. The factors considered in determining the price included the recent market price of our common stock, the general condition of the securities market at the time of this offering, the history of, and the prospects, for the industry in which we compete, our past and present operations, and our prospects for future revenues.

The placement agent may be deemed to be an underwriter within the meaning of Section 2(a)(11) of the Securities Act, and any fees or commissions received by it and any profit realized on the resale of securities sold by it while acting as principal might be deemed to be underwriting discounts or commissions under the Securities Act. As an underwriter, the placement agent is required to comply with the requirements of the Securities Act and the Exchange Act, including, without limitation, Rule 415(a)(4) under the Securities Act and Rule 10b-5 and Regulation M under

the Exchange Act. These rules and regulations may limit the timing of purchases and sales of shares of common stock and warrants by the placement agent. Under these rules and regulations, the placement agent:

- may not engage in any stabilization activity in connection with our securities; and
- may not bid for or purchase any of our securities or attempt to induce any person to purchase any of our securities, other than as permitted under the Exchange Act, until it has completed its participation in the distribution.

S-13

From time to time in the ordinary course of their respective businesses, the placement agent or its affiliates have in the past or may in the future engage in investment banking and/or other services with us and our affiliates for which it has or may in the future receive customary fees and expenses.

Under the securities purchase agreement, we will also agree with the purchasers that while the warrants are outstanding, we will not effect or enter into an agreement to effect a “Variable Rate Transaction,” which means a transaction in which we:

- issue or sell any convertible securities either (A) at a conversion, exercise or exchange rate or other price that is based upon and/or varies with the trading prices of, or quotations for, the shares of our common stock at any time after the initial issuance of such convertible securities, or (B) with a conversion, exercise or exchange price that is subject to being reset at some future date after the initial issuance of such convertible securities or upon the occurrence of specified or contingent events directly or indirectly related to our business or the market for our common stock, other than pursuant to a customary “weighted average” anti-dilution provision; or
- enter into any agreement (including, without limitation, an equity line of credit) whereby we may sell securities at a future determined price (other than standard and customary “preemptive” or “participation” rights).

We will agree with the purchasers that, subject to certain exceptions, if we issue securities within the 12 months following the closing of this offering, the purchasers shall have the right to purchase all of the securities on the same terms, conditions and price provided for in the proposed issuance of securities.

We will also agree to indemnify the purchasers against certain losses resulting from our breach of any of our representations, warranties, or covenants under agreements with the purchasers as well as under certain other circumstances described in the securities purchase agreement.

We have agreed to indemnify the placement agent against liabilities under the Securities Act of 1933, as amended. We have also agreed to contribute to payments the placement agent may be required to make in respect of such liabilities.

Fees

The placement agent will be entitled to a cash fee of 6.5% of the gross proceeds paid to us for the securities we sell in this offering. We will also reimburse the placement agent for all reasonable and documented out-of-pocket expenses that have been incurred by the placement agent in connection with the offering, which shall not exceed the lesser of (i) \$75,000 or (ii) 8% of the gross proceeds received by us from the sale of the common stock and warrants, less the placement agent’s placement fee of 6.5%. In addition, all placement agent expenses over \$75,000 require consent from us for reimbursement.

The following table shows the per fixed combination and total placement agency fees we will pay to the placement agent in connection with the sale of the securities offered pursuant to this prospectus supplement assuming the purchase of all of the securities offered hereby:

| | |
|---|-----------|
| Placement agency fees per fixed combination | \$0.15 |
| Total | \$179,156 |

Because there is no minimum offering amount required, the actual total placement agency fees, if any, are not presently determinable and may be substantially less than the maximum amount set forth above. The maximum fees

to be received by any member of the Financial Industry Regulatory Association, or FINRA, or independent broker-dealer may not be greater than 8% of the initial gross proceeds from the sale of any securities being offered hereby.

The sale of up to 1,225,000 shares of common stock and warrants to purchase up to 918,750 shares of common stock will be completed on or about August 24, 2010. We estimate the total offering expenses of this offering that will be payable by us, excluding the placement agency fees, will be approximately \$65,000, which include legal and printing costs, various other fees and reimbursement of the placement agent's expenses. At the closing, The Depository Trust Company will credit the shares of common stock to the respective accounts of the investors. We will mail warrants directly to the investors at the respective addresses set forth in the securities purchase agreement.

S-14

Restrictions on Future Issuances of Securities

In the securities purchase agreement, we will agree, subject to certain exceptions, that we will not within 30 trading days following the close of this offering (which period may be extended in certain circumstances), directly or indirectly issue, offer, sell, grant any option or right to purchase, or otherwise dispose of (or announce any issuance, offer, sale, grant of any option or right to purchase or other disposition of) any equity security or any equity-linked or related security, any convertible security, any debt, any preferred stock or any purchase rights subject to certain exceptions, including:

- the issuance of employee stock options or shares of restricted stock pursuant to equity compensation plans; and
- issuances of shares of our common stock upon the exercise of convertible securities.

The foregoing does not purport to be a complete statement of the terms and conditions of the placement agency agreement and securities purchase agreement. Copies of the placement agency agreement and the securities purchase agreement will be included as exhibits to our current report on Form 8-K that will be filed with the SEC and incorporated by reference into the Registration Statement of which this prospectus supplement forms a part. See “Where You Can Find More Information” on page S-15.

LEGAL MATTERS

Certain legal matters in connection with the offering and the validity of the securities offered by this prospectus supplement will be passed upon for us by Dorsey & Whitney LLP. Lowenstein Sandler PC, Roseland, New Jersey, is acting as counsel for the placement agent in connection with various matters relating to the securities offered hereby.

EXPERTS

Tanner LC, independent registered public accountants, have audited our financial statements and the effectiveness of our internal control over financial reporting incorporated by reference in this prospectus for the year ended August 31, 2009, as set forth in their report which is incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements are incorporated by reference in reliance on Tanner LC’s report, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We are a reporting company and file annual, quarterly and current reports, proxy statements and other information with the SEC. We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities we are offering under this prospectus supplement and the accompanying prospectus. This prospectus supplement and the accompanying prospectus do not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus supplement and the accompanying prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. You may read and copy the registration statement, as well as our reports, proxy statements and other information, at the SEC’s Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. You can request copies of these documents by writing to the SEC and paying a fee for the copying cost. Please call the SEC at 1-800-SEC-0330 for more information about the operation of the Public Reference Room. The SEC maintains an internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, where our SEC filings are also available. The address of the SEC’s web site is “<http://www.sec.gov>.” We maintain a website at www.bsdmc.com. Information contained in or accessible through our website does not constitute a part of this

prospectus.

S-15

INCORPORATION BY REFERENCE

The SEC allows us to “incorporate by reference” information that we file with it into this prospectus supplement and the accompanying prospectus, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is an important part of this prospectus supplement and the accompanying prospectus. The information incorporated by reference is considered to be a part of this prospectus supplement and the accompanying prospectus, and information that we file later with the Commission will automatically update and supersede information contained in this prospectus supplement and the accompanying prospectus. We incorporate by reference the documents listed below that we have previously filed with the Commission:

· Our Annual Report on Form 10-K for the year ended August 31, 2009;

- the information specifically incorporated by reference into our Annual Report on Form 10-K for the year ended August 31, 2009 from our definitive proxy statement on Schedule 14A filed with the SEC on December 28, 2009; and
- our Quarterly Reports on Form 10-Q for the quarterly periods ended November 30, 2009, February 28, 2010 and May 31, 2010;
- our current reports on Form 8-K filed with the SEC on February 9, 2010, February 11, 2010 (two filings), May 3, 2010, August 18, 2010, and August 19, 2010, as well as our current reports on Form 8-K/A filed with the SEC on February 17, 2010 and May 5, 2010; and
- the description of the Company’s Common Stock, par value \$0.001 per share, as contained in Item 1 of the Registration Statement on Form 8-A filed on April 22, 2008, including any amendment or report filed for the purpose of updating such description.

We also incorporate by reference into this prospectus additional documents that we may file with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, excluding, in each case, information deemed furnished and not filed, until we sell all of the securities we are offering or the termination of the offering. Any statements contained in a previously filed document incorporated by reference into this prospectus is deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus, or in a subsequently filed document also incorporated by reference herein, modifies or supersedes that statement.

We will provide to each person, including any beneficial owner, to whom a prospectus is delivered, without charge upon written or oral request, a copy of any or all of the information that has been incorporated by reference into this prospectus but not delivered with the prospectus, including exhibits that are specifically incorporated by reference into such documents. Requests should be directed to: BSD Medical Corporation, Attention: Investor Relations, 2188 West 2200 South, Salt Lake City, UT 84119, telephone: (801) 972-5555.

1,225,000 Shares of Common Stock

Warrants to Purchase 918,750 Shares of Common Stock

918,750 Shares of Common Stock Issuable Upon Exercise of the Warrants

BSD MEDICAL CORPORATION

PROSPECTUS SUPPLEMENT

Roth Capital Partners

August 19, 2010

PROSPECTUS
\$50,000,000
COMMON STOCK, PREFERRED STOCK,
DEBT SECURITIES,
WARRANTS AND UNITS
BSD MEDICAL CORPORATION

From time to time, we may offer up to \$50,000,000 of any combination of the securities described in this prospectus, either individually or in units.

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. We may also authorize one or more free writing prospectuses to be provided to you in connection with these offerings. The prospectus supplement and any related free writing prospectus may also add, update or change information contained in this prospectus. You should carefully read this prospectus, the applicable prospectus supplement and any related free writing prospectus, as well as any documents incorporated by reference before you invest in any securities. This prospectus may not be used to consummate a sale of securities unless accompanied by the applicable prospectus supplement.

Our common stock is listed on The Nasdaq Global Market under the symbol “BSDM.” On September 22, 2009, the last reported sale price for our common stock was \$3.83 per share. The applicable prospectus supplement will contain information, where applicable, as to any other listing on The Nasdaq Global Market or any securities market or other exchange of the securities, if any, covered by the prospectus supplement.

INVESTING IN OUR SECURITIES INVOLVES RISKS. YOU SHOULD REVIEW CAREFULLY THE RISKS AND UNCERTAINTIES DESCRIBED UNDER THE HEADING “RISK FACTORS” ON PAGE 4 AND CONTAINED IN THE APPLICABLE PROSPECTUS SUPPLEMENT AND ANY RELATED FREE WRITING PROSPECTUS AND UNDER SIMILAR HEADINGS IN THE OTHER DOCUMENTS THAT ARE INCORPORATED BY REFERENCE INTO THIS PROSPECTUS.

We will sell these securities directly to investors, through agents designated from time to time or to or through underwriters or dealers. For additional information on the methods of sale, you should refer to the section entitled “Plan of Distribution” in this prospectus. If any underwriters are involved in the sale of any securities with respect to which this prospectus is being delivered, the names of such underwriters and any applicable commissions or discounts will be set forth in a prospectus supplement. The price to the public of such securities and the net proceeds we expect to receive from such sale will also be set forth in a prospectus supplement.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR DETERMINED IF THIS PROSPECTUS IS TRUTHFUL OR COMPLETE. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

The date of this prospectus is October 1, 2009

TABLE OF CONTENTS

| | |
|---|----|
| ABOUT THIS PROSPECTUS | 1 |
| SUMMARY | 1 |
| RISK FACTORS | 4 |
| SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS | 4 |
| USE OF PROCEEDS | 5 |
| DESCRIPTION OF CAPITAL STOCK | 5 |
| DESCRIPTION OF DEBT SECURITIES | 9 |
| DESCRIPTION OF WARRANTS | 10 |
| DESCRIPTION OF UNITS | 11 |
| PLAN OF DISTRIBUTION | 12 |
| LEGAL MATTERS | 14 |
| EXPERTS | 15 |
| WHERE YOU CAN FIND MORE INFORMATION | 15 |
| INCORPORATION BY REFERENCE | 15 |

ABOUT THIS PROSPECTUS

This prospectus is a part of a registration statement that we filed with the Securities and Exchange Commission, or SEC, utilizing a “shelf” registration process. Under this shelf registration process, we may sell any combination of the securities described in this prospectus in one or more offerings up to a total dollar amount of \$50,000,000. 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. We may also authorize one or more free writing prospectuses to be provided to you that may contain material information relating to these offerings. The prospectus supplement and any related free writing prospectus that we may authorize to be provided to you may also add, update or change information contained in this prospectus or in any documents that we have incorporated by reference into this prospectus. You should read this prospectus, any applicable prospectus supplement and any related free writing prospectus, together with the information incorporated herein by reference as described under the heading “Incorporation by Reference.”

You should rely only on the information that we have provided or incorporated by reference in this prospectus, any applicable prospectus supplement and any related free writing prospectus that we may authorize to be provided to you. 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, any applicable prospectus supplement or any related free writing prospectus that we may authorize to be provided to you. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus or the accompanying prospectus supplement. This prospectus and the accompanying supplement to this prospectus 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 supplement to this prospectus 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, any applicable prospectus supplement or any related free writing prospectus 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, any applicable prospectus supplement or any related free writing prospectus is delivered or securities sold on a later date.

SUMMARY

Prospectus Summary

This summary highlights selected information from this prospectus and does not contain all of the information that you need to consider in making your investment decision. You should carefully read the entire prospectus, including the risks of investing discussed under “Risk Factors” beginning on page 4, the information incorporated by reference, including our financial statements, and the exhibits to the registration statement of which this prospectus is a part.

Throughout this prospectus, references to “BSD,” the “Company,” “we,” “us,” and “our” refer to BSD Medical Corporation.

Our Company

We develop, manufacture, market and service medical systems that deliver precision-focused radio frequency (RF) or microwave energy into diseased sites of the body, heating them to specified temperatures as required by a variety of medical therapies. Our business objectives are to commercialize our products developed for the treatment of cancer and to further expand our systems to treat other diseases and medical conditions. Our product line for cancer therapy has been created to offer hospitals and clinics a complete solution for thermal treatment for cancer provided through

microwave/RF systems.

While our primary developments to date have been cancer treatment systems, we also pioneered the use of microwave thermal therapy for the treatment of symptoms associated with enlarged prostate, and we are responsible for technology that has contributed to a new medical industry addressing the needs of men's health. In accordance with our strategic plan, we subsequently sold our interest in TherMatrix, Inc., the company established to commercialize our technology to treat enlarged prostate symptoms, to provide substantial funding that we can utilize for commercializing our systems used in the treatment of cancer and in achieving other business objectives.

Our product line includes systems that have been strategically designed to offer a range of thermal treatment systems for the treatment of cancer, including both hyperthermia and ablation treatment systems. Studies have shown that both hyperthermia and ablation treatments kill cancer but they have different clinical applications.

Our hyperthermia cancer treatment systems are used to treat cancer with heat (hyperthermia) while boosting the effectiveness of radiation through a number of biological mechanisms. Hyperthermia is usually used to increase the effectiveness of other therapies; e.g., radiation therapy and chemotherapy for the treatment of locally advanced cancers. Hyperthermia usually refers to treatments delivered at temperatures of 40-49°C for one hour.

Our microwave ablation system is to be used to ablate (remove or vaporize) soft tissue with heat alone. Thermal ablation usually refers to heat treatments delivered at temperatures above 55°C for short periods of time. Thermal ablation is used to destroy local tumors using a short intense focus of heat on a specific area, which is usually small, similar to surgical removal of the tumor.

Our primary mission is to develop the full spectrum of medical uses for our special competence in precision-focused RF/microwave systems, and to broadly apply the utilization of our technology to treat cancer and benign diseases and conditions.

Our principal executive offices are located at 2188 West 2200 South, Salt Lake City, Utah 84101, and our telephone number is (801) 972-5555.

The Securities We May Offer

We may offer shares of our common stock and preferred stock, various series of debt securities and warrants to purchase any of such securities, either individually or in units, with a total value of up to \$50 million from time to time under this prospectus, together with any applicable prospectus supplement and related free writing prospectus, at prices and on terms to be determined by market conditions at the time of offering. This prospectus provides you with a general description of the securities we may offer. Each time we offer a type or series of securities, we will provide a prospectus supplement that will describe the specific amounts, prices and other important terms of the securities, including, to the extent applicable:

· designation or classification;

· aggregate principal amount or aggregate offering price;

· maturity, if applicable;

· original issue discount, if any;

· rates and times of payment of interest or dividends, if any;

· redemption, conversion, exchange or sinking fund terms, if any;

· conversion or exchange prices or rates, if any, and, if applicable, any provisions for changes to or adjustments in the conversion or exchange prices or rates and in the securities or other property receivable upon conversion or exchange;

· ranking;

- restrictive covenants, if any;
- voting or other rights, if any; and
- important United States federal income tax considerations.

A prospectus supplement and any related free writing prospectus that we may authorize to be provided to you may also add, update or change information contained in this prospectus or in documents we have incorporated by reference. However, no prospectus supplement or free writing prospectus will offer a security that is not registered and described in this prospectus at the time of the effectiveness of the registration statement of which this prospectus is a part.

We may sell the securities directly to or through underwriters, dealers or agents. We, and our underwriters or agents, reserve the right to accept or reject all or part of any proposed purchase of securities. If we do offer securities through underwriters or agents, we will include in the applicable prospectus supplement:

the names of those underwriters or agents;

applicable fees, discounts and commissions to be paid to them;

details regarding over-allotment options, if any; and

the net proceeds to us.

Common Stock. We may offer shares of our common stock from time to time. Holders of our common stock are entitled to one vote per share on all matters that require stockholder approval. Subject to any preferential rights of any outstanding preferred stock, holders of our common stock are entitled to dividends when and if declared by the board of directors. Our common stock is described in greater detail in this prospectus under “Description of Capital Stock — Common Stock.”

Preferred Stock. We currently have authorized 10,000,000 shares of preferred stock, \$0.001 par value per share. We may offer shares of our preferred stock from time to time, in one or more series. Under our certificate of incorporation, our board of directors currently has the authority to designate the shares of preferred stock in one or more series and to fix the privileges, preferences and rights of each series of preferred stock, any or all of which may be greater than the rights of the common stock. Our Preferred Stock is described in greater detail in this prospectus under “Description of Capital Stock — Preferred Stock.”

We will fix the rights, preferences, privileges, qualifications and restrictions of the preferred stock of each series that we sell under this prospectus and applicable prospectus supplements in the certificate of designation relating to that series. We will incorporate by reference into the registration statement of which this prospectus is a part the form of any certificate of designation that describes the terms of the series of preferred stock we are offering before the issuance of the related series of preferred stock. We urge you to read the prospectus supplements and any free writing prospectus that we may authorize to be provided to you related to the series of preferred stock being offered, as well as the complete certificate of designation that contains the terms of the applicable series of preferred stock.

Debt Securities. We may offer debt securities from time to time, in one or more series, as either senior or subordinated debt or as senior or subordinated convertible debt. The debt securities will be issued under one or more documents called indentures, which are contracts between us and a trustee for the holders of the debt securities. In this prospectus, we have summarized certain general features of the debt securities under “Description of Debt Securities.” We urge you, however, to read the prospectus supplements and any free writing prospectus that we may authorize to be provided to you related to the series of debt securities being offered, as well as the complete indentures that contain the terms of the debt securities. Forms of indentures have been filed as exhibits to the registration statement of which this prospectus is a part, and supplemental indentures and forms of debt securities containing the terms of debt securities being offered will be filed as exhibits to the registration statement of which this prospectus is a part, or incorporated by reference from a current report on Form 8-K that we file with the SEC.

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

The warrants will be evidenced by warrant certificates issued under one or more warrant agreements, which are contracts between us and an agent for the holders of the warrants. In this prospectus, we have summarized certain general features of the warrants under "Description of Warrants." We urge you, however, to read the prospectus supplements and any free writing prospectus that we may authorize to be provided to you related to the series of warrants being offered, as well as the complete warrant agreements and warrant certificates that contain the terms of the warrants. Specific warrant agreements will contain additional important terms and provisions and will be filed as exhibits to the registration statement of which this prospectus is a part, or incorporated by reference from a current report on Form 8-K that we file with the SEC.

Units. We may offer units consisting of common stock, preferred stock, debt securities and/or warrants to purchase any of such securities in one or more series. In this prospectus, we have summarized certain general features of the units under "Description of Units." We urge you, however, to read the prospectus supplements and any free writing prospectus that we may authorize to be provided to you related to the series of units being offered, as well as the unit agreements that contain the terms of the units. We will file as exhibits to the registration statement of which this prospectus is a part, or will incorporate by reference from a current report on Form 8-K that we file with the SEC, the form of unit agreement and any supplemental agreements that describe the terms of the series of units we are offering before the issuance of the related series of units.

We will evidence each series of units by unit certificates that we will issue under a separate agreement. We will enter into the unit agreements with a unit agent. Each unit agent will be a bank or trust company that we select. We will indicate the name and address of the unit agent in the applicable prospectus supplement relating to a particular series of units.

THIS PROSPECTUS MAY NOT BE USED TO OFFER OR SELL ANY SECURITIES UNLESS ACCOMPANIED BY A PROSPECTUS SUPPLEMENT.

RISK FACTORS

An investment in our securities involves a high degree of risk. The prospectus supplement applicable to each offering of our securities will contain a discussion of the risks applicable to an investment in our securities. Prior to making a decision about investing in our securities, you should carefully consider the specific factors discussed under the heading "Risk Factors" in the applicable prospectus supplement, together with all of the other information contained or incorporated by reference in the prospectus supplement or appearing or incorporated by reference in this prospectus. You should also consider the risks, uncertainties and assumptions discussed under Item 1A, "Risk Factors," in our Annual Report on Form 10-K for the fiscal year ended August 31, 2008, and our Quarterly Reports on Form 10-Q for the quarterly periods ended November 30, 2008, February 28, 2009 and May 31, 2009, all of which are incorporated herein by reference, and may be amended, supplemented or superseded from time to time by other reports we file with the Securities and Exchange Commission in the future. The risks and uncertainties we have described are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our operations.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference contain forward-looking statements. These are based on our management's current beliefs, expectations and assumptions about future events, conditions and results and on

information currently available to us. Discussions containing these forward-looking statements may be found, among other places, in the Sections entitled “Business,” “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” incorporated by reference from our most recent Annual Report on Form 10-K and in our Quarterly Reports on Form 10-Q, as well as any amendments thereto, filed with the SEC. Within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, these forward-looking statements include, but are not limited to, statements about our business, technologies, prospects, partners, customers, suppliers and regulatory strategies.

All statements, other than statements of historical fact, included or incorporated herein regarding our strategy, future operations, financial position, future revenues, projected costs, plans, prospects and objectives are forward-looking statements. In some cases, you can identify forward-looking statements by terms such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” and similar expressions. Forward-looking statements involve risks, uncertainties and other factors that may cause our actual results, performance, time frames or achievements to be materially different from any future results, performance, time frames or achievements expressed or implied by the forward-looking statements. Risks, uncertainties and other factors that might cause or contribute to such differences include, but are not limited to, those discussed in the Section entitled “Risk Factors” in our most recent Annual Report on Form 10-K and in our Quarterly Reports on Form 10-Q, as well as any amendments thereto filed with the SEC. Given these risks, uncertainties and other factors, many of which are beyond our control, you should not place undue reliance on these forward-looking statements.

Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to revise any forward-looking statements to reflect events or developments occurring after the date of this prospectus, even if new information becomes available in the future.

USE OF PROCEEDS

Except as described in any applicable prospectus supplement and in any free writing prospectuses in connection with a specific offering, we currently intend to use the net proceeds from the sale of the securities offered hereby for operating costs, capital expenditures and for general corporate purposes, including working capital. We may also use a portion of the net proceeds to invest in or acquire businesses or technologies that we believe are complementary to our own, although we have no current plans, commitments or agreements with respect to any acquisitions as of the date of this prospectus. Pending these uses, we intend to invest the net proceeds in investment-grade, interest-bearing securities.

DESCRIPTION OF CAPITAL STOCK

As of the date of this prospectus, our certificate of incorporation authorizes us to issue 40,000,000 shares of common stock, par value \$0.001 per share, and 10,000,000 shares of preferred stock, par value \$0.001 per share. As of August 31, 2009, 22,039,301 shares of common stock were outstanding and no shares of preferred stock were outstanding.

The following description of our capital stock is a summary. It is not complete and is subject to and qualified in its entirety by our Amended and Restated Certificate of Incorporation and Bylaws, as amended, a copy of each of which has been incorporated as an exhibit to the registration statement of which this prospectus forms a part.

Our Amended and Restated Certificate of Incorporation and Bylaws contain certain provisions that are intended to enhance the likelihood of continuity and stability in the composition of the board of directors, which may have the effect of delaying, deferring or preventing a future takeover or change in control of BSD unless such takeover or change in control is approved by our board of directors.

Common Stock

Holders of common stock are entitled to one vote per share on all matters to be voted upon by the stockholders. Holders of common stock do not have cumulative voting rights, and, therefore, holders of a majority of the shares voting for the election of directors can elect all of the directors. In such event, the holders of the remaining shares will not be able to elect any directors. Subject to preferences that may be applicable to any then-outstanding preferred stock, holders of common stock are entitled to receive such dividends as may be declared from time to time

by our board of directors out of funds legally available therefore. We have never declared or paid cash dividends on our capital stock. We expect to retain future earnings, if any, for use in the operation and expansion of our business, and do not anticipate paying any cash dividends in the foreseeable future.

In the event of our liquidation, dissolution or winding up, holders of common stock are entitled to share ratably in all assets legally available for distribution after payment of all debts and other liabilities and subject to the prior rights of the holders of any preferred stock then outstanding. Holders of common stock have no preemptive or other subscription or conversion rights, and there are no redemption or sinking fund provisions applicable to the common stock.

All outstanding shares of common stock are, and all shares of common stock to be outstanding upon the closing of this offering will be, fully paid and nonassessable.

Additional shares of authorized common stock may be issued, as authorized by our board of directors from time to time, without stockholder approval, except as may be required by applicable stock exchange requirements.

The transfer agent and registrar for our common stock is OTC Stock Transfer, Inc. Our common stock is listed on The Nasdaq Global Market under the symbol "BSDM".

Preferred Stock

As of the date of this prospectus, there were no shares of preferred stock outstanding. Our Amended and Restated Certificate of Incorporation authorizes 10,000,000 shares of undesignated preferred stock. Our board of directors will have the authority, without any further vote or action by our stockholders, to issue from time to time the preferred stock in one or more series and to fix the price, rights, preferences, privileges and restrictions thereof, including dividend rights, dividend rates, conversion rights, voting rights, terms of redemption, redemption prices, liquidation preferences and the number of shares constituting a series or the designation of such series. The issuance of preferred stock, while providing desirable flexibility in connection with possible acquisitions and other corporate purposes, could decrease the amount of earnings and assets available for distribution to holders of common stock or adversely affect the rights and powers, including voting rights, of the holders of common stock, and may have the effect of delaying, deferring or preventing a change in control without further action by the stockholders. We have no current plans to issue any shares of preferred stock.

Future Preferred Stock. Our board of directors will fix the rights, preferences, privileges, qualifications and restrictions of the preferred stock of each series that we sell under this prospectus and applicable prospectus supplements in the certificate of designation relating to that series. We will file as an exhibit to the registration statement of which this prospectus is a part, or incorporate by reference into the registration statement of which this prospectus is a part the form of any certificate of designation that describes the terms of the series of preferred stock we are offering before the issuance of the related series of preferred stock. This description will include:

- the title and stated value;
- the number of shares we are offering;
- the liquidation preference per share;
- the purchase price per share;
- the dividend rate per share, dividend period and payment dates and method of calculation for dividends;
- whether dividends will be cumulative or non-cumulative and, if cumulative, the date from which dividends will accumulate;

- our right, if any, to defer payment of dividends and the maximum length of any such deferral period;
- the procedures for any auction and remarketing, if any;

- the provisions for a sinking fund, if any;
- the provisions for redemption or repurchase, if applicable, and any restrictions on our ability to exercise those redemption and repurchase rights;
- any listing of the preferred stock on any securities exchange or market;
- whether the preferred stock will be convertible into our common stock or other securities of ours, including warrants, and, if applicable, the conversion period, the conversion price, or how it will be calculated, and under what circumstances it may be adjusted;
- whether the preferred stock will be exchangeable into debt securities, and, if applicable, the exchange period, the exchange price, or how it will be calculated, and under what circumstances it may be adjusted;
- voting rights, if any, of the preferred stock;
- preemption rights, if any;
- restrictions on transfer, sale or other assignment, if any;
- a discussion of any material or special United States federal income tax considerations applicable to the preferred stock;
- the relative ranking and preferences of the preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs;
- any limitations on issuances of any class or series of preferred stock ranking senior to or on a parity with the series of preferred stock being issued as to dividend rights and rights if we liquidate, dissolve or wind up our affairs; and
 - any other specific terms, rights, preferences, privileges, qualifications or restrictions of the preferred stock.

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

The General Corporation Law of the State of Delaware, the state of our incorporation, provides that the holders of preferred stock will have the right to vote separately as a class on any proposal involving fundamental changes in the rights of holders of that preferred stock. This right is in addition to any voting rights that may be provided for in the applicable certificate of designation.

Antitakeover Effects of Provisions of Charter Documents and Delaware Law

Certain provisions of our Amended and Restated Certificate of Incorporation and Bylaws could make the following more difficult:

- acquisition of us by means of a tender offer;
- acquisition of us by means of a proxy contest or otherwise; and
- the removal of our incumbent officers and directors.

These provisions, summarized below, are expected to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors. We believe that the benefits of increased protection resulting from our potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure us outweigh the disadvantages of discouraging such proposals because we believe that the negotiation of such proposals could result in an improvement of their terms.

Stockholder Meetings. Our Amended and Restated Certificate of Incorporation provides that only the board of directors, the Chairman of the Board, the Chief Executive Officer or our President may call special meetings of stockholders. The provision may not be amended without the affirmative vote of holders of at least 66 2/3% of our outstanding voting stock.

Elimination of Stockholder Action By Written Consent. Our charter documents eliminate the right of stockholders to act by written consent without a meeting.

Elimination of Cumulative Voting. Our charter documents do not provide for cumulative voting in the election of directors.

Undesignated Preferred Stock. The ability to authorize undesignated preferred stock makes it possible for the board of directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to change control of us. These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of us.

Delaware Takeover Statute. We are subject to Section 203 of the General Corporation Law of the State of Delaware, or DGCL, which regulates acquisitions of some Delaware corporations. In general, Section 203 prohibits, with some exceptions, a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a period of three years following the date of the transaction in which the person became an interested stockholder, unless:

- the board of directors of the corporation approved the business combination or the other transaction in which the person became an interested stockholder prior to the date of the business combination or other transaction;
- upon consummation of the transaction that resulted in the person becoming an interested stockholder, the person owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding shares owned by persons who are directors and also officers of the corporation and shares issued under employee stock plans under which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or subsequent to the date the person became an interested stockholder, the board of directors of the corporation approved the business combination and the stockholders of the corporation authorized the business combination at an annual or special meeting of stockholders by the affirmative vote of at least 66-2/3% of the outstanding stock of the corporation not owned by the interested stockholder.

Section 203 of the DGCL generally defines a “business combination” to include any of the following:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, pledge or other disposition to the interested stockholder of assets with a value equal to 10% or more of the corporation’s assets or outstanding stock;
- in general, any transaction that results in the issuance or transfer by the corporation of any of its stock to the interested stockholder;
- any transaction involving the corporation that has the effect of increasing the proportionate share of its stock owned by the interested stockholder; or

· the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an “interested stockholder” as any person who, together with the person’s affiliates and associates, owns, or within three years prior to the determination of interested stockholder status did own, 15% or more of a corporation’s voting stock.

Section 203 of the DGCL could depress our stock price and delay, discourage or prohibit transactions not approved in advance by our board of directors, such as takeover attempts that might otherwise involve the payment to our stockholders of a premium over the market price of our common stock.

The provisions of Delaware law and our Amended and Restated Certificate of Incorporation and Bylaws could have the effect of discouraging others from attempting unsolicited takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored unsolicited takeover attempts. Such provisions may also have the effect of preventing changes in our management. It is possible that these provisions could make it more difficult to accomplish transactions, which stockholders may otherwise deem to be in their best interests.

DESCRIPTION OF DEBT SECURITIES

This section describes the general terms and provisions of the debt securities that we may offer using this prospectus and the related indentures. This section is only a summary and does not purport to be complete. You must look to the relevant form of debt security and the related indenture for a full understanding of all terms of any series of debt securities. The form of debt security and the related indenture have been or will be filed or incorporated by reference as exhibits to the registration statement of which this prospectus is a part. See “Where You Can Find More Information” for information on how to obtain copies.

We may issue senior or subordinated debt securities from time to time in one or more series under one of two separate indentures, which may be supplemented or amended from time to time. Senior debt securities will be issued under a senior indenture and subordinated debt securities will be issued under a subordinated indenture. The senior debt indenture and the subordinated debt indenture are referred to individually in this prospectus as the “indenture” and collectively as the “indentures.” This prospectus outlines briefly the provisions of the indentures. The particular terms of a series of debt securities and the extent, if any, to which the particular terms of the issue modify the terms of the indenture will be described in the accompanying prospectus supplement relating to such series of debt securities. In some instances, certain of the precise terms of debt securities you are offered may be described in a further prospectus supplement, known as a pricing supplement. The indentures are subject to and governed by the Trust Indenture Act of 1939, as amended, and may be supplemented or amended from time to time following their execution.

The debt securities may be denominated and payable in U.S. dollars or foreign currencies. We may also issue debt securities with the principal amount, interest or other amounts payable to be determined by reference to one or more currency exchange rates, securities or baskets of securities, commodity prices, indices or any other financial, economic or other measure or instrument, including the occurrence or non-occurrence of any event or circumstance. Debt securities may bear interest at a fixed rate, which may be zero, or a floating rate.

Some of the debt securities may be issued as original issue discount debt securities. Original issue discount securities bear no interest or bear interest at below-market rates and will be sold at a discount from their stated principal amount. The prospectus supplement relating to an issue of original issue discount securities will contain information relating to United States federal income tax, accounting, and other special considerations applicable to original issue discount securities.

Holders may present debt securities for exchange or transfer, in the manner, at the places and subject to the restrictions stated in the debt securities and described in the applicable prospectus supplement and other offering material we will

provide. We will provide these services without charge except for any tax or other governmental charge payable in connection with these services and subject to any limitations provided in the applicable indenture pursuant to which such debt securities are issued.

Holders may transfer debt securities in definitive bearer form and the related coupons, if any, by delivery to the transferee. If any of the securities are held in global form, the procedures for transfer of interests in those securities will depend upon the procedures of the depository for those global securities.

We will generally have no obligation to repurchase, redeem, or change the terms of debt securities upon any event (including a change in control) that might have an adverse effect on our credit quality.

DESCRIPTION OF WARRANTS

The following description, together with the additional information we may include in any applicable prospectus supplements and free writing prospectuses, summarizes the material terms and provisions of the warrants that we may offer under this prospectus, which may consist of warrants to purchase common stock, preferred stock or debt securities and may be issued in one or more series. Warrants may be offered independently or together with common stock, preferred stock or debt securities offered by any prospectus supplement, and may be attached to or separate from those securities. While the terms we have summarized below will apply generally to any warrants that we may offer under this prospectus, we will describe the particular terms of any series of warrants that we may offer in more detail in the applicable prospectus supplement and any applicable free writing prospectus. The terms of any warrants offered under a prospectus supplement may differ from the terms described below. However, no prospectus supplement will fundamentally change the terms that are set forth in this prospectus or offer a security that is not registered and described in this prospectus at the time of its effectiveness.

We will issue the warrants under a warrant agreement that we will enter into with a warrant agent to be selected by us. The warrant agent will act solely as an agent of ours in connection with the warrants and will not act as an agent for the holders or beneficial owners of the warrants. We will file as exhibits to the registration statement of which this prospectus is a part, or will incorporate by reference from a current report on Form 8-K that we file with the SEC, the form of warrant agreement, including a form of warrant certificate, that describes the terms of the particular series of warrants we are offering before the issuance of the related series of warrants. The following summaries of material provisions of the warrants and the warrant agreements are subject to, and qualified in their entirety by reference to, all the provisions of the warrant agreement and warrant certificate applicable to a particular series of warrants. We urge you to read the applicable prospectus supplement and any applicable free writing prospectus related to the particular series of warrants that we sell under this prospectus, as well as the complete warrant agreements and warrant certificates that contain the terms of the warrants.

General

We will describe in the applicable prospectus supplement the terms relating to a series of warrants, including, if applicable:

- the offering price and aggregate number of warrants offered;
- the currency for which the warrants may be purchased;
- if applicable, the designation and terms of the securities with which the warrants are issued and the number of warrants issued with each such security or each principal amount of such security;
- If applicable, the date on and after which the warrants and the related securities will be separately transferable;
- in the case of warrants to purchase debt securities, the principal amount of debt securities purchasable upon exercise of one warrant and the price at, and currency in which, this principal amount of debt securities may be purchased

upon such exercise;

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

- the effect of any merger, consolidation, sale or other disposition of our business on the warrant agreements and the warrants;
- the terms of any rights to redeem or call the warrants;
- any provisions for changes to or adjustments in the exercise price or number of securities issuable upon exercise of the warrants;
- the dates on which the right to exercise the warrants will commence and expire;
- the manner in which the warrant agreements and warrants may be modified;
- material United States federal income tax consequences of holding or exercising the warrants;
- the terms of the securities issuable upon exercise of the warrants; and
- any other specific terms, preferences, rights or limitations of or restrictions on the warrants.

Before exercising their warrants, holders of warrants will not have any of the rights of holders of the securities purchasable upon such exercise, including:

- in the case of warrants to purchase debt securities, the right to receive payments of principal of, or premium, if any, or interest on, the debt securities purchasable upon exercise or to enforce covenants in the applicable indenture; or
- in the case of warrants to purchase common stock or preferred stock, the right to receive dividends, if any, or payments upon our liquidation, dissolution or winding up or to exercise voting rights, if any.

Exercise of Warrants

Each warrant will entitle the holder to purchase the securities that we specify in the applicable prospectus supplement at the exercise price that we describe in the applicable prospectus supplement. Unless we otherwise specify in the applicable prospectus supplement, holders of the warrants may exercise the warrants at any time up to the specified time on the expiration date that we set forth in the applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants will become void.

Holders of the warrants may exercise the warrants by delivering the warrant certificate representing the warrants to be exercised together with specified information, and paying the required amount to the warrant agent in immediately available funds, as provided in the applicable prospectus supplement. We will set forth on the reverse side of the warrant certificate and in the applicable prospectus supplement the information that the holder of the warrant will be required to deliver to the warrant agent.

Upon receipt of the required payment and the warrant certificate properly completed and duly executed at the corporate trust office of the warrant agent or any other office indicated in the applicable prospectus supplement, we will issue and deliver the securities purchasable upon such exercise. If fewer than all of the warrants represented by the warrant certificate are exercised, then we will issue a new warrant certificate for the remaining amount of warrants. If we so indicate in the applicable prospectus supplement, holders of the warrants may surrender securities as all or part of the exercise price for warrants.

DESCRIPTION OF UNITS

The following description, together with the additional information we may include in any applicable prospectus supplements, summarizes the material terms and provisions of the units that we may offer under this prospectus. While the terms we have summarized below will apply generally to any units that we may offer under this prospectus, we will describe the particular terms of any series of units in more detail in the applicable prospectus supplement. The terms of any units offered under a prospectus supplement may differ from the terms described below. However, no prospectus supplement will fundamentally change the terms that are set forth in this prospectus or offer a security that is not registered and described in this prospectus at the time of its effectiveness.

We will file as exhibits to the registration statement of which this prospectus is a part, or will incorporate by reference from a current report on Form 8-K that we file with the SEC, the form of unit agreement that describes the terms of the series of units we are offering, and any supplemental agreements, before the issuance of the related series of units. The following summaries of material terms and provisions of the units are subject to, and qualified in their entirety by reference to, all the provisions of the unit agreement and any supplemental agreements applicable to a particular series of units. We urge you to read the applicable prospectus supplements related to the particular series of units that we sell under this prospectus, as well as the complete unit agreement and any supplemental agreements that contain the terms of the units.

General

We may issue units comprised of one or more debt securities, shares of common stock, shares of preferred stock and warrants in any combination. Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately, at any time or at any time before a specified date.

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

- the designation and terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;
- any provisions of the governing unit agreement that differ from those described below; and
- any provisions for the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units.

The provisions described in this section, as well as those described under “Description of Capital Stock,” “Description of Debt Securities” and “Description of Warrants” will apply to each unit and to any common stock, preferred stock, debt security or warrant included in each unit, respectively.

Issuance in Series

We may issue units in such amounts and in numerous distinct series as we determine.

Enforceability of Rights by Holders of Units

Each unit agent will act solely as our agent under the applicable unit agreement and will not assume any obligation or relationship of agency or trust with any holder of any unit. A single bank or trust company may act as unit agent for more than one series of units. A unit agent will have no duty or responsibility in case of any default by us under the applicable unit agreement or unit, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a unit may, without the consent of the related unit agent or the holder of any other unit, enforce by appropriate legal action its rights as holder under any security included in the unit.

We, the unit agents, and any of their agents may treat the registered holder of any unit certificate as an absolute owner of the units evidenced by that certificate for any purpose and as the person entitled to exercise the rights attaching to the units so requested, despite any notice to the contrary.

PLAN OF DISTRIBUTION

We may sell the securities to or through underwriters or dealers, through agents, directly to one or more purchasers, or through any combination of these methods. 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, at market prices prevailing at the time of sale, at prices related to the prevailing market prices or at negotiated prices. A prospectus supplement or supplements (and any related free writing prospectus that we may authorize to be provided to you) will describe the terms of the offering of the securities, including, to the extent applicable:

- the name or names of any underwriters, if any;
- the purchase price of the securities and the proceeds we will receive from the sale;
- any over-allotment options under which underwriters may purchase additional securities from us;
- any agency fees or underwriting discounts and other items constituting agents' or underwriters' compensation;
- any public offering price;
- any discounts or concessions allowed or reallocated or paid to dealers; and
- any securities exchange or market on which the securities may be listed.

Only underwriters named in the prospectus supplement are underwriters of the securities offered by the prospectus supplement.

By Underwriters

If underwriters are used in the sale, they will acquire the securities for their own account and may resell the securities from time to time in one or more transactions at a fixed public offering price or at varying prices determined at the time of sale. The obligations of the underwriters to purchase the securities will be subject to the conditions set forth in the applicable underwriting agreement. We may offer the securities to the public through underwriting syndicates represented by managing underwriters or by underwriters without a syndicate. Subject to certain conditions, the underwriters will be obligated to purchase all of the securities offered by the prospectus supplement. Any public offering price and any discounts or concessions allowed or reallocated may change from time to time. We may use underwriters with whom we have a material relationship. We will describe in the prospectus supplement, naming the underwriter, the nature of any such relationship.

By Dealers

If a dealer is utilized in the sale of any securities offered by this prospectus, we will sell those securities to the dealer, as principal. The dealer may then resell the securities to the public at varying prices to be determined by the dealer at the time of resale. We will set forth the names of the dealers and the terms of the transaction in the applicable prospectus supplement.

By Agents

We may sell securities directly or through agents we designate from time to time. We will name any agent involved in the offering and sale of securities and we will describe any commissions we will pay the agent in the prospectus supplement. Unless the prospectus supplement states otherwise, our agent will act on a best-efforts basis for the period of its appointment.

By Direct Sales

We may also directly sell securities offered by this prospectus. In this case, no underwriters or agents would be involved. We will describe the terms of those sales in the applicable prospectus supplement.

General Information

Underwriters, dealers and agents that participate in the distribution of the securities offered by this prospectus may be deemed underwriters under the Securities Act of 1933, as amended (the Securities Act), and any discounts or commissions they receive from us and any profit on their resale of the securities may be treated as underwriting discounts and commissions under the Securities Act.

We may authorize agents or underwriters to solicit offers by certain types of institutional investors to purchase securities from us at the public offering price set forth in the prospectus supplement pursuant to delayed delivery contracts providing for payment and delivery on a specified date in the future. We will describe the conditions to these contracts and the commissions we must pay for solicitation of these contracts in the prospectus supplement.

We may provide agents and underwriters with indemnification against civil liabilities related to this offering, including liabilities under the Securities Act, or contribution with respect to payments that the agents or underwriters may make with respect to these liabilities. Agents and underwriters may engage in transactions with, or perform services for, us in the ordinary course of business.

All securities we offer, other than common stock, will be new issues of securities with no established trading market. Any 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 cannot guarantee the liquidity of the trading markets for any securities.

We may enter into derivative transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement indicates, in connection with those derivatives, the third parties may sell securities covered by this prospectus and the applicable prospectus supplement, including in short sale transactions. If so, the third parties may use securities pledged by us or borrowed from us or others to settle those sales or to close out any related open borrowings of stock, and may use securities received from us in settlement of those derivatives to close out any related open borrowings of stock. The third parties in such sale transactions will be identified in the applicable prospectus supplement.

One or more firms, referred to as “remarketing firms,” may also offer or sell the securities, if the 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 agents for us. These remarketing firms will offer or sell the securities in accordance with the terms of the securities. The prospectus supplement will identify any 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.

In connection with an offering of our securities, underwriters, dealers or agents may purchase and sell them in the open market. These transactions may include stabilizing transactions and purchases to cover syndicate short positions created in connection with the offering. Stabilizing transactions consist of some bids or purchases for the purpose of preventing or slowing a decline in the market price of the securities, and syndicate short positions involve the sale by the underwriters or agents, as the case may be, of a greater number of securities than they are required to purchase from us in the offering. Underwriters may also impose a penalty bid, which means that the underwriting syndicate may reclaim selling concessions allowed to syndicate members or other broker dealers who sell securities in the offering for their account if the syndicate repurchases the securities in stabilizing or covering transactions. These activities may stabilize, maintain or otherwise affect the market price of the securities, which may be higher than the price that might otherwise prevail in the open market. These activities, if commenced, may be discontinued at any time without notice. These transactions may be affected on any securities exchange on which the securities may be listed, in the over-the-counter market or otherwise.

LEGAL MATTERS

Dorsey & Whitney LLP, Salt Lake City, Utah will pass for us upon the validity of the securities being offered by this prospectus and applicable prospectus supplement, and counsel named in the applicable prospectus supplement will pass upon legal matters for any underwriters, dealers or agents.

EXPERTS

Tanner LC, independent registered public accountants, have audited our financial statements and the effectiveness of the Company's internal control over financial reporting incorporated by reference in this prospectus for the year ended August 31, 2008, as set forth in their report which is incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements are incorporated by reference in reliance on Tanner LC's report, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We are a reporting company and file annual, quarterly and current reports, proxy statements and other information with the SEC. We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities we are offering under this prospectus. This prospectus does not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. You may read and copy the registration statement, as well as our reports, proxy statements and other information, at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. You can request copies of these documents by writing to the SEC and paying a fee for the copying cost. Please call the SEC at 1-800-SEC-0330 for more information about the operation of the Public Reference Room. The SEC maintains an internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, where our SEC filings are also available. The address of the SEC's web site is "<http://www.sec.gov>." We maintain a website at www.bsdmc.com. Information contained in or accessible through our website does not constitute a part of this prospectus.

INCORPORATION BY REFERENCE

The SEC allows us to "incorporate by reference" information that we file with it into this prospectus, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is an important part of this prospectus. The information incorporated by reference is considered to be a part of this prospectus, and information that we file later with the Commission will automatically update and supersede information contained in this prospectus and any accompanying prospectus supplement. We incorporate by reference the documents listed below that we have previously filed with the Commission:

- Our Annual Report on Form 10-K for the year ended August 31, 2008;
- Our Quarterly Reports on Form 10-Q for the quarters ended November 30, 2008, February 28, 2009 and May 31, 2009;
- Our Current Reports on Form 8-K filed on September 11, 2008, April 8, 2009, April 14, 2009, May 18, 2009, July 29, 2009 and Form 8-K/A filed on September 9, 2008, April 14, 2009 and July 29, 2009; and
- the description of the Company's Common Stock, par value \$0.001 per share, as contained in Item 1 of the Registration Statement on Form 8-A filed on April 22, 2008, including any amendment or report filed for the purpose of updating such description.

We also incorporate by reference into this prospectus additional documents that we may file with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, excluding, in each case, information deemed furnished and not filed until we sell all of the securities we are offering or the termination of the offering. Any statements contained in a

previously filed document incorporated by reference into this prospectus is deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus, or in a subsequently filed document also incorporated by reference herein, modifies or supersedes that statement.

We will provide to each person, including any beneficial owner, to whom a prospectus is delivered, without charge upon written or oral request, a copy of any or all of the information that has been incorporated by reference into this prospectus but not delivered with the prospectus, including exhibits that are specifically incorporated by reference into such documents. Requests should be directed to: BSD Medical Corporation, Attention: Investor Relations, 2188 West 2200 South, Salt Lake City, UT 84119, telephone: (801) 972-5555.

BSD MEDICAL CORPORATION
\$50,000,000
Common Stock, Preferred Stock,
Debt Securities,
Warrants and Units
PROSPECTUS
October 1, 2009