BOVIE MEDICAL CORP
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PROSPECTUS
BOVIE MEDICAL CORPORATION

995,713 Shares of Common Stock of Bovie Corporation

This prospectus relates to the resale by selling stockholders named in this prospectus or their pledgees, donees, transferees, or other successors in interest of up to 571,429 shares of our common stock, which they acquired in a private placement transaction and up to 424,284 shares of our common stock issuable upon the exercise of certain warrants that they hold. The securities registered also include a certain number of shares of common stock as may be issued pursuant to the anti-dilution and adjustment provisions of such securities provided in the warrants. We will not receive any proceeds from any such sale of these Shares, however we may receive payment in cash upon exercise of warrants held by such selling stockholders.

Our common stock is listed on the NYSE AMEX under the symbol “BVX.” The last reported sale price of our common stock on May 20, 2010 was $4.19 per share.

Investing in our securities involves risks that are described in the “Risk Factors” section of this prospectus which begins on page 3.

The shares of common stock may be offered by the selling stockholders in negotiated transactions, at either prevailing market prices or negotiated prices. Each selling stockholder in its discretion may also offer the shares of common stock from time to time in ordinary brokerage transactions on the NYSE AMEX or otherwise. See our discussion in the “Plan of Distribution” section of this prospectus.

The selling stockholders and any brokers executing selling orders on behalf of the selling stockholders may be deemed to be "underwriters" within the meaning of the Securities Act of 1933, as amended, and commissions received by a broker executing selling orders may be deemed to be underwriting commissions under the Securities Act.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR PASSED UPON THE ACCURACY OR ADEQUACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

THE DATE OF THIS PROSPECTUS IS JUNE 7, 2010

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You should read this prospectus, including all documents incorporated herein by reference, together with additional information described under “Where You Can Find More Information.”

You may obtain the information incorporated by reference without charge by following the instructions under “Where You Can Find More Information.”

SUMMARY

The following summary highlights selected information contained elsewhere or incorporated by reference in this prospectus. This summary does not contain all the information you should consider before investing in our securities. You should read the entire prospectus and the documents incorporated by reference in this prospectus carefully before making an investment decision.

You should rely only on the information contained or incorporated by reference in this prospectus. We have not authorized anyone else to provide you with different or additional information. We are not making an offer to sell these securities in any jurisdiction where the offer is not permitted. You should not assume that the information contained in this prospectus or in the documents incorporated by reference herein is accurate as of any date other than the date on the front of this prospectus or the filing date of any document incorporated by reference, regardless of its time of delivery, and you should not consider any information in this prospectus or in the documents incorporated by reference herein to be investment, legal or tax advice. We encourage you to consult your own counsel, accountant and other advisors for legal, tax, business, financial and related advice regarding an investment in our securities.

As used in this prospectus, "Bovie," "we," "our" and "us" refer to Bovie Medical Corporation and its subsidiaries, unless stated otherwise or the context requires otherwise.

Our Company

Bovie Medical Corporation was incorporated in 1982, under the laws of the State of Delaware and has its principal executive offices at 734 Walt Whitman Road, Melville, New York 11747.

We are actively engaged in the business of developing, manufacturing and marketing medical products and devices and developing related technologies. Aaron Medical Industries (“Aaron”), a 100% owned subsidiary based in Clearwater, Florida is engaged in marketing our Company’s medical devices. Bovie Canada, ULC, an Alberta corporation and a wholly-owned subsidiary of BVX Holdings, LLC, which is wholly-owned by Bovie, is based in Windsor, Ontario, Canada and its principal function was product development and manufacturing focused on mainly endoscopic devices. Our Canadian operations were recently consolidated in our Clearwater, Florida facility. We manufacture and market electrosurgical products, cauteries and other medical devices.

Our electro-surgery products line consists of desiccators, generators, electrodes, electro-surgery pencils and various disposable products. These products are used in surgery for the cutting and coagulation of tissue and are compatible with most major manufacturers’ electrosurgery generator products and constitute our largest product line. In addition to a wide variety of generators, we have customized generators especially designed for the gastroenterological and other niche markets.

We manufacture and market our products both under private label and the Bovie/Aaron label to distributors worldwide. Additionally, we have original equipment manufacturing (OEM) agreements with other medical device manufacturers. These OEM arrangements combined with private label and the Bovie/Aaron label have allowed our Company to gain greater market share for the distribution of our products.

Our principal executive office is located at 734 Walt Whitman Road, Melville, NY 11747, and our telephone number is (631) 421-5452. Our website address is www.boviemed.com. Information contained on our website is not a part of this prospectus.

About This Offering

This prospectus relates to the resale by the selling stockholders identified in this prospectus of up to 995,713 shares of common stock, including shares of common stock issuable upon the exercise of warrants. All of the shares, when sold, will be sold by these selling stockholders. The selling stockholders may sell their shares of common stock from time to time at prevailing market prices. We will not receive any proceeds from the sale of the shares of common stock by the selling stockholders. However, we may receive the sale price of any common stock we sell to the selling stockholders upon exercise of the outstanding warrants.

Common Stock Offered:	Up to 995,713 shares of common stock, including up to 424,284 shares of common stock (the "Warrant Shares") issuable upon the exercise of common stock warrants which have an initial exercise price equal to $6.00 per share, and expire on April 27, 2015. All of the warrants are held by accredited investors and the issuance of any shares of common stock to these holders upon (i) a cash exercise of warrants shall be effected as a private offering in accordance with Section 4(2) of the Securities Act or (ii) a cashless exercise of warrants shall be effected in accordance with Section 3(a)(9) of the Securities Act.
Common Stock Outstanding at May 20, 2010:	17,690,127
Use of Proceeds:	We will not receive any proceeds from the sale of the 995,713 shares of common stock subject to sale by the selling stockholders under this prospectus. However, we may receive up to an aggregate of approximately $1,979,994 from the exercise of the outstanding warrants, assuming all warrants are exercised for cash. The warrants may also be exercised by surrender of the warrants in exchange for an equal value of shares in accordance with the terms of the warrants. Any net proceeds we receive from the selling stockholders through the exercise of warrants will be used for general corporate purposes.
NYSE Amex Symbol:	BVX

Risk Factors

Our business is subject to substantial risk. Please carefully consider the "Risk Factors" section and other information in this prospectus for a discussion of risks. Additional risks and uncertainties not presently known to us or that we currently deem to be immaterial may also impair our business and operations.

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RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully consider the risks and uncertainties described below and the other risks listed under the heading "Risk Factors" in our filings with the SEC and incorporated by reference into this prospectus. Additional risks not presently known to us or that we currently believe are immaterial may also significantly impair our business operations. If any of these risks were to occur, our business, financial condition, or results of operations would likely suffer. In that event, the trading price of our common stock could decline, and you could lose all or part of your investment.

Risks Relating to our Business

General economic conditions, including continued weakening of the economy, may affect customer purchases of capital equipment, which could adversely affect our sales.

The medical device industry historically has been subject to cyclical variations, recessions in the general economy and future economic outlook. Throughout fiscal year 2009 and the first five months of fiscal 2010, there was significant deterioration and/or disruption in the global financial markets and economic environment, which we believe has continued to negatively impact spending for capital equipment. Our results are dependent on a number of factors impacting customer spending for capital equipment, including general economic and business conditions; changes in hospital purchasing procedures, wages and employment levels; availability of credit and capital; credit and interest rates; tax rates; pending healthcare legislation; and general political conditions, both domestic and abroad. A continued or incremental downturn in the U.S. economy, an uncertain economic outlook or an expanded credit crisis could continue to adversely affect our business and our revenues and profits.

We do a substantial amount of business with certain original equipment manufacturers (“OEM”) which as a group have produced substantial revenues for our Company. Loss of business from a major OEM customer will likely adversely affect our business.

We manufacture the majority of our products at our premises in Clearwater, Florida. Labor-intensive sub-assemblies and labor-intensive products may be out-sourced to our specification. Although we sell through distributors, we market our products through national trade journal advertising, direct mail, distributor sales representatives and trade shows, under the Bovie name, the Bovie/Aaron name and private label. Major distributors include Allegiance (a Cardinal Company), IMCO, McKesson Medical Surgical, Inc., Medline, NDC (Abco, Cida and Starline), Owens & Minor, and Physician Sales & Service. If any of these distributor relationships are terminated or not replaced, our revenue from the territories served by these distributors could be adversely affected.

We have a major OEM customer, Arthrex, Inc. for which we manufacture products on a private label basis, pursuant to an agreement. On August 31, 2007, we amended and extended this manufacturing agreement for an additional three year period. The amended terms continue to provide that we will be reimbursed for our expenses in developing any changes or modifications to products according to Arthrex’s specifications, and that Arthrex continues to own the intellectual property. In addition, general provisions for product warranties, insurance, termination, and confidentiality remain the same. The main change to the amended manufacturing agreement is the elimination of the provision that required Arthrex to exclusively purchase the products from us as well as the elimination of the provision that required us to forego competing in the same Arthrex markets with said products. This amended Arthrex Agreement has termination dates of December 6, 2010 and March 2011 for the generators. In fiscal 2009, Arthrex orders represented approximately 22% of our total revenues. As such, should Arthrex determine to reduce or cease placement of orders for the products, or decline to extend or review its agreements with us, our business will likely be materially and

adversely affected.

With respect to receivables, our ten largest customers accounted for approximately 65%, 76% and 73% of trade receivables as of December 31, 2009, 2008 and 2007, respectively, and 71.5%, 70% and 71% of net revenues for the respective years then ended. In 2009, 2008 and 2007, Arthrex was our only customer that accounted for over 10% of total revenues, accounting for 22%, 20% and 21%, respectively of such revenues. All of these entities are customers of our U.S. operations. We perform ongoing credit evaluations of our customers and generally do not require collateral because we believe we have procedures in place to limit potential for significant losses, and because of the nature of our customer base.

We are also dependent on other OEM customers who have no legal obligation to purchase products. Should the collaborative customer fail to give us purchase orders for the product after development, our future business and value of related assets could be negatively affected. Furthermore, no assurance can be given that a collaborative customer will give sufficient high priority to our products. Finally, disagreements or disputes may arise between Bovie and its contractual customers, which could adversely affect production of our products.

We rely on certain suppliers and manufacturers for raw materials and other products and are vulnerable to fluctuations in the availability and price of such products and services.

Fluctuations in the price, availability, and quality of the raw materials we use in our manufacturing could have a negative effect on our cost of sales and our ability to meet the demands of our customers. Inability to meet the demands of our customers could result in the loss of future sales. In addition, the costs to manufacture our products depends in part on the market prices of the raw materials used to produce the them. We may not be able to pass along to our customers all or a portion of our higher costs of raw materials due to competitive and marketing pressures, which could decrease our earnings.

We also have informal collaborative arrangements with three foreign suppliers under which we request the development of certain items and components and we purchase them pursuant to purchase orders. Our purchase order commitments are never more than one year in duration and are supported by orders from our customers.

Current challenges in the credit and capital markets may adversely affect our business and financial condition.

The current global economic crisis described below should also be considered when reviewing each of the risks relating to our business.

The recent global economic and financial market crisis has caused, among other things, a general tightening in the credit and capital markets, lower levels of liquidity, increases in the rates of default and bankruptcy, and lower consumer and business spending. Although the ultimate outcome of these events cannot be predicted, they may have a material adverse effect on the Company and our ability to raise capital or borrow money in the credit markets and potentially to draw on our revolving credit facility or otherwise obtain financing. Similarly, current or potential customers and suppliers may no longer be in business, may be unable to fund purchases or may decide to reduce purchases, all of which could lead to reduced demand for our products, reduced gross margins, and increased customer payment delays or defaults. Further, suppliers may not be able to supply us with needed raw materials on a timely basis, may increase prices or go out of business, which could result in our inability to meet customer demand in a timely manner or affect our gross margins. We are also limited in our ability to reduce costs to offset the results of a prolonged or severe economic downturn given certain fixed costs associated with our operations.

If we are unable to protect our patents or other proprietary rights, or if we infringe on the patents or other proprietary rights of others, our competitiveness and business prospects may be materially damaged.

We own 20 outstanding patents and trademarks with some of our earlier patents currently having diminished useful lives. We also have several U.S. and international patent applications pending for various new products. We can give no assurance that competitors will not infringe on our patent rights or otherwise create similar or non-infringing competing products that are technically patentable in their own right.

We have recently filed new patent applications for various new products including a scanning cannula, modular laparoscopic and endoscopic instruments, the output stage to our generator platform, our ICON product line and a Plasma Stream patent application relating to the plasma technology.

Divestitures of some of our operations or product lines may materially and adversely affect our business and results of operations.

We periodically evaluate the performance of all of our operations and although we have not to date, we may sell, or close a portion of our business or product lines. Any divestitures may result in significant write-offs, including those related to goodwill and other intangible assets, which could have a material adverse effect on our business and results of operations. Divestitures could involve additional risks, including difficulties in the separation of operations, services, products and personnel, the diversion of management's attention from other business concerns, the disruption of our business and the potential loss of key employees. We may not be successful in managing these or any other significant risks that we encounter in divesting a business or product line.

Although we carry liability insurance, due to the nature of our products and their use by professionals, we may, from time to time, be subject to litigation from persons who sustain injury during medical procedures in hospitals, physicians offices or in clinics and defending such litigations is expensive, disruptive, time consuming and could adversely affect our business.

The manufacture and sale of medical products entail significant risks of product liability claims. We currently maintain product liability insurance with combined coverage limits of $10 million on a claims-made basis. There is no assurance that this coverage will be adequate to protect us from any possible liabilities we might incur in connection with the sale or testing of our products. In addition, we may need increased product liability coverage as products are commercialized. This insurance is expensive and in the future may not be available on acceptable terms, if at all.

Our business is subject to the potential for defects or failures associated with our products which could lead to recalls or safety alerts and negative publicity.

Manufacturing flaws, component failures, design defects, off-label uses or inadequate disclosure of product-related information could result in an unsafe condition or the injury or death of a patient. These problems could lead to a recall of, or issuance of a safety alert relating to, our products and result in significant costs and negative publicity. Due to the strong name recognition of our brands, an adverse event involving one of our products could result in reduced market acceptance and demand for all products within that brand, and could harm our reputation and our ability to market our products in the future. In some circumstances, adverse events arising from or associated with the design, manufacture or marketing of our products could result in the suspension or delay of our current regulatory reviews of our applications for new product approvals. We also may voluntarily recall products or temporarily shut down production lines based on internal safety and quality monitoring and testing data. Any of the foregoing problems could disrupt our business and have a material adverse effect on our business, results of operations, financial condition and cash flows.

Our manufacturing facility is located in Clearwater, Florida and could be affected due to multiple risks from fire, hurricanes and the like.

Our manufacturing facility is located in Clearwater, Florida and could be affected by multiple weather risks, most notably hurricanes (one of which previously caused damage to the roof of one of our buildings as well as some of our furniture and equipment). The damage was mildly disruptive to operations. Although we carry casualty insurance and business interruption insurance, future possible disruptions of operations due to hurricanes or other weather risks could affect our ability to meet our commitments to our customers and impair important business relationships, the loss of which could adversely affect our operations and profitability.

Risks Related to Our Industry

The medical device industry is highly competitive and we may be unable to compete effectively.

The medical device industry is highly competitive. Many competitors in this industry are well-established, do a substantially greater amount of business, and have greater financial resources and facilities than we do.

Domestically, we believe we rank third in the number of units sold in the field of electrosurgical generator manufacturing and we sell our products and compete with other manufacturers in various ways. In addition to advertising, attending trade shows and supporting our distribution channels, we strive to enhance product quality, improve user friendliness and expand product exposure.

We also compete by private labeling our products for major distributors under their label. This allows us to increase our position in the marketplace and thereby compete from two different approaches, our Aaron or Bovie label, and our customers' private label. Our private label customers distribute our products under their name through their internal sales force. We believe our main competitors do not private label their products.

Lastly, we sell the majority of our products through distributors. Many of the companies we compete with sell direct, thus competing directly with distributors they sometimes use.

Our main competitors are Conmed, Valleylab (a division of Covidien) and Erbe Electromedizine, in the electrosurgery market, Xomed (a division of Medtronics), in the battery operated cautery market, Salient Surgical Technologies (formerly Tissuelink) in the saline enhanced sintered steel market and Ethicon and U.S. Surgical in the endoscopic instrumentation market. We believe our competitive position did not materially change in 2009.

Our industry is highly regulated by the U.S. Food and Drug Administration and internationally including other governmental, state and federal agencies which have substantial authority to establish criteria which must be complied with in order for us to continue in operation.

United States

The Company's products and research and development activities are subject to regulation by the FDA and other regulatory bodies. FDA regulations govern, among other things, the following activities:

- Product development;
- Product testing;
- Product labeling;
- Product storage;
- Pre-market clearance or approval;
- Advertising and promotion;
- Product traceability; and
- Product indications.

In the United States, medical devices are classified on the basis of control deemed necessary to reasonably ensure the safety and effectiveness of the device. Class I devices are subject to general controls. These controls include registration and listing, labeling, pre-market notification and adherence to the FDA Quality System Regulation. Class II devices are subject to general and special controls. Special controls include performance standards, post market surveillance, patient registries and FDA guidelines. Class III devices are those which must receive pre-market approval (as discussed below) by the FDA to ensure their safety and effectiveness. Currently, we only manufacture Class I and Class II devices. Pre-market notification clearance must be obtained for some Class I and most Class II devices when the FDA does not require pre-market approval. All Bovie products have been cleared by the pre-market notification process. To date, the FDA has not failed to clear any devices we have submitted.

A pre-market approval application is required for most Class III devices. A pre-market approval application must be supported by valid scientific evidence to demonstrate the safety and effectiveness of the device. The pre-market approval application typically includes:

- Results of bench and laboratory tests, animal studies, and clinical studies
- A complete description of the device and its components
- A detailed description of the methods, facilities and controls used to manufacture the device, and proposed labeling.

The pre-market approval process can be expensive, uncertain and lengthy. A number of devices for which pre-market approval has been sought by other companies have never been approved for marketing.

International Regulation

To market products in the European Union, our products must bear the “CE” mark. Manufacturers of medical devices bearing the CE mark have gone through a conformity assessment process that assures that products are manufactured in compliance with a recognized quality system and to comply with the European Medical Devices Directive.

Each device that bears a CE mark has an associated technical file that includes a description of the following:

- Description of the device and its components,
- A summary of how the device complies with the essential requirements of the medical devices directive,
- Safety (risk assessment) and performance of the device,
- Clinical evaluations with respect to the device,
- Methods, facilities and quality controls used to manufacture the device, and
- Proposed labeling for the device.

Manufacturing and distribution of a device is subject to ongoing surveillance by the appropriate regulatory body to ensure continued compliance with quality system and reporting requirements.

We began CE marking of devices for sale in the European Union in 1999. In addition to the requirement to CE mark, each member country of the European Union maintains the right to impose additional regulatory requirements.

Outside of the European Union, regulations vary significantly from country to country. The time required to obtain approval to market products may be longer or shorter than that required in the United States or the European Union. Certain European countries outside of the European Union do recognize and give effect to the CE mark certification. We are permitted to market and sell our products in those countries.

If we are unable to successfully introduce new products or fail to keep pace with advances in technology, our business, financial condition and results of operations could be adversely affected. In addition, our research and development efforts rely upon investments and alliances, and we cannot guarantee that any previous or future investments or alliances will be successful.

Our research and development activities are an essential component of our efforts to develop new innovative products for introduction in the marketplace. New and improved products play a critical role in our sales growth. We continue to place emphasis on the development of proprietary products and product improvements to complement and expand our existing product lines. We maintain close working relationships with physicians and medical personnel in hospitals and universities who assist in product research and areas of development. Our research and development activities are primarily conducted internally and are expensed as incurred. These expenses include direct expenses for wages, materials and services associated with the development of our products net of any reimbursements from customers. Research and development expenses do not include any portion of general and administrative expenses. Our Clearwater, FL facility is our flagship research and design location. Currently, we are continuing the development of our new products, including the ICON GP/VS and ICON GS, as well as the accompanying Endoscopic Modular Instruments, the Polarian handle and accessories. We expect to make future investments to enable us to develop new technologies and products to further our strategic objectives and strengthen our existing business. However, we cannot guarantee that any of our previous or future investments will be successful.

The amount expended by us on research and development of our products during the years 2009, 2008 and 2007, totaled approximately $2.1, $2.1, and $1.6 million respectively. During the past three years, we invested in the J-Plasma technology, currently used in one of our new products under development, the ICON GS plasma system. In addition, we invested in the BOSS and other saline enhanced electrosurgical devices, Endoscopic Modular Instruments, and accompanying new generators. We have not incurred any direct costs relating to environmental regulations or requirements. For 2010, we expect our expenditures for research and development activities to remain around the same level as 2009.

Our international operations subject us to foreign currency fluctuations.

We operate internationally and enter into transactions denominated in foreign currencies (most notably the Euro). To date, we have not hedged our exposure to changes in foreign currency exchange rates, and as a result, we are subject to foreign currency transaction gains and losses. We purchase goods and services in U.S. and in Euros. As of January 1, 2010, we stopped invoicing any sale to European customers in Euros. Foreign exchange risk is managed primarily by satisfying foreign denominated expenditures with cash flows or assets denominated in the same currency. Up until we consolidated our Canadian operations, we charged currency value fluctuations related to our Canadian assets and liabilities to our accumulated other comprehensive account which amounts were not material.

Our operations are subject to certain recently enacted healthcare reform legislative which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

In 2009, both the U.S. Senate and House of Representatives passed, and the President signed, comprehensive healthcare reform legislation which included provisions that would impose a fee or excise tax on certain medical devices. The regulations relating to this legislation have not been published or approved but we believe these fees and excise taxes will apply to some or all of our medical device and supply products which could result in making our products more expensive to our customers or forcing us to reduce our prices.

Our operations may experience higher costs to produce our products as a result of changes in prices for oil, gas and other commodities.

We use some plastics and other petroleum-based materials along with precious metals contained in electronic components as raw materials in many of our products. Prices of oil and gas also significantly affect our costs for freight and utilities. Oil, gas and precious metal prices are volatile and may increase, resulting in higher costs to produce and distribute our products. Due to the highly competitive nature of the healthcare industry and the cost-containment efforts of our customers we may be unable to pass along cost increases through higher prices. If we are unable to fully recover these costs through price increases or offset through other cost reductions, our results of operations could be materially and adversely affected.

Risks Related to our Common Stock

The sale of a significant number of shares could cause the market price of our stock to decline.
The sale by us or the resale by stockholders of a significant number of shares of our common stock could cause the market price of our common stock to decline. We cannot predict whether future sales of our common stock, or the availability of our common stock for sale, will adversely affect the market price for our common stock or our ability to raise capital by offering equity securities.

If we fail to meet the requirements for continued listing on the NYSE Amex, our common stock could be delisted from trading, which would adversely affect the liquidity of our common stock and our ability to raise additional capital.

Our common stock is currently listed for quotation on the NYSE Amex. Accordingly, we are required to meet specified financial and compliance requirements in order to maintain our listing. If our stock price falls below listing requirements, we could receive a deficiency notice from NYSE Amex. If in the future we fail to satisfy the NYSE Amex's continued listing requirements, our common stock could be delisted from the NYSE Amex. Any potential delisting of our common stock from the NYSE Amex would make it more difficult for our stockholders to sell our stock in the public market and would likely result in decreased liquidity and increased volatility for our common stock.

Because we do not expect to pay dividends, you will not realize any income from an investment in our common stock unless and until you sell your shares at profit.

We have never paid dividends on our capital stock and we do not anticipate that we will pay any dividends for the foreseeable future. Accordingly, any return on an investment in our Company will be realized, if at all, only when you sell shares of our common stock.

The issuance of preferred stock could adversely effect common stockholders.

Pursuant to our Certificate of Incorporation, the Board has authority to issue up to 10,000,000 shares of preferred stock and to fix the rights, preferences, privileges and restrictions, including voting rights, of these shares without any further vote or action by the stockholders. The rights of the holders of the common stock will be subject to, and may be adversely affected by, the rights of the holders of any preferred stock that may be issued in the future. The issuance of preferred stock, while providing desirable flexibility in connection with possible acquisitions and other corporate purposes, could have the effect of making it more difficult for a third party to acquire a majority of our outstanding voting stock, thereby delaying, deferring or preventing a change in control of the company. Furthermore, such preferred stock may have other rights, including economic rights, senior to the common stock, and as a result, the issuance of such preferred stock could have a material adverse effect on the common stockholders including the market price of the common stock.

These problems could discourage potential acquisition proposals and could delay or prevent a change in control of the company. Such provisions could diminish the opportunities for a stockholder to participate in tender offers, including tender offers at a price above the then current market price of the common stock. Such provisions also may inhibit fluctuations in the market price of the common stock that could result from takeover attempts.

As of the date of this prospectus, we do not have any outstanding shares of preferred stock nor is there any plan for us to issue shares of preferred stock as of this date.

Risks related to climate change

Our manufacturing facility does not produce hazardous materials or emissions that would adversely impact the environment. We do however, have air conditioning units and consume electricity which could be impacted by climate change in the form of increased rates. We do not however believe the increase in expense from the rate increases, as a percentage of sales, would be material in the near term.

The effect on the Company's business and operations related to physical changes in the planet caused by climate change such as increased storms (hurricanes) could result in impaired production of products or damages to property, plant and equipment. We maintain a backup generator at our Clearwater facility and a disaster recovery plan in place to help mitigate this risk.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements within the meaning of Section 27A of the Securities Act regarding our business, financial condition, results of operations and prospects. Words such as expects, anticipates, intends, plans, believes, seeks, estimates and similar expressions or variations of such words are intended to identify forward-looking statements. However, these are not the exclusive means of identifying forward-looking statements. Although forward-looking statements contained in this prospectus reflect our good faith judgment, such statements can only be based on facts and factors currently known to us. Consequently, forward-looking statements are inherently subject to risks and uncertainties, and actual outcomes may differ materially from the results and outcomes discussed in the forward-looking statements. Further information about the risks and uncertainties that may impact us are described or incorporated by reference in "Risk Factors" beginning on page 3. You should read that section carefully. You should not place undue reliance on forward-looking statements, which speak only as of the date of this prospectus. We undertake no obligation to update publicly any forward-looking statements in order to reflect any event or circumstance occurring after the date of this prospectus or currently unknown facts or conditions or the occurrence of unanticipated events.

USE OF PROCEEDS

The shares of common stock to be offered and sold pursuant to this prospectus will be offered and sold by the selling stockholders or their transferees. We will not receive any proceeds from the sale of the shares of common stock by the selling stockholders. We will, however, receive the proceeds of any cash exercises of warrants which, if received, would be used by us for working capital purposes.

SELLING STOCKHOLDERS

The shares of common stock being offered by the selling stockholders are those that have been issued to the selling stockholders and those that are issuable to the selling stockholders upon exercise of the warrants. For additional information regarding the issuance of the shares of common stock and the warrants, see "Private Placement of Common Stock and Warrants" above. We are registering the shares of common stock in order to permit the selling stockholders to offer the shares for resale from time to time. Except for the ownership of the shares of common stock and the warrants issued pursuant to the Securities Purchase Agreement, the selling stockholders have not had any material relationship with us within the past three years.

The table below lists the selling stockholders and other information regarding the beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder) of the shares of common stock held by each of the selling stockholders. The second column lists the number of shares of common stock beneficially owned by the selling stockholders, based on their respective ownership of shares of common stock and warrants, as of April 27, 2010, assuming exercise of the warrants held by each such selling stockholder on that date but taking account of any limitations on exercise set forth therein.

The third column lists the shares of common stock being offered by this prospectus by the selling stockholders and does not take in account any limitations on exercise of the warrants set forth therein.

In accordance with the terms of a registration rights agreement with the holders of the shares of common stock and the warrants, this prospectus generally covers the resale of the sum of (i) shares of common stock that have been issued to the selling stockholders and (ii) 133% the maximum number of shares of common stock issuable upon exercise of the warrants, determined as if the outstanding warrants were exercised in full (without regard to any limitations on exercise contained therein) as of the trading day immediately preceding the date this registration statement was initially filed with the SEC. Because the exercise price of the warrants may be adjusted, the number of shares that will actually be issued may be more or less than the number of shares being offered by this prospectus. The fourth column assumes the sale of all of the shares offered by the selling stockholders pursuant to this prospectus.

Under the terms of the warrants, a selling stockholder may not exercise the warrants to the extent (but only to the extent) such selling stockholder or any of its affiliates would beneficially own a number of shares of our common stock which would exceed 4.9% or 9.9% (as applicable). The number of shares in the second column reflects these limitations. The selling stockholders may sell all, some or none of their shares in this offering. See "Plan of Distribution."

Selling Stockholder	Beneficial Ownership Before Offering		Total Shares Offered By Selling Stockholder	Beneficial Ownership After Offering	
	Shares	Percent		Shares(1)	Percent(1)
Highbridge International LLC(2)	271,429(3)	1.59%	301,286(3)	0	0%
DAFNA LifeScience Market Neutral Ltd. (4)	41,700(5)	*	46,287(5)	0	0%
DAFNA LifeScience Ltd. (4)	45,000(6)	*	49,950 (6)	0	0%
DAFNA LifeScience Select Ltd. (4)	127,586(7)	*	141,620(7)	0	0%
Cranshire Capital, L.P. (8)	135,715(9)	*	150,644(9)	0	0%

Freestone Advantage Partners, LP(10)	7,141(11)	*	7,926(11)	0	0%
2035718 Ontario Inc. (12)	142,857(13)	*	158,571(13)	0	0%
Bristol Investment Fund, Ltd. (14)	85,714(15)	*	95,143(15)	0	0%
Rodman & Renshaw, LLC(16)	28,286(17)	*	28,286(17)	0	0%
Noam Rubinstein	2,571(18)	*	2,571(18)	0	0%
Benjamin Bowen	3,429(19)	*	3,429(19)	0	0%
Gilford Securities Incorporated(20)	10,000(21)	*	10,000(21)	0	0%

*	Less than 1% of the outstanding Shares of common stock.
(1)	Assumes that all the shares of the selling stockholders covered by this prospectus are sold, and that the selling stockholders do not acquire any additional shares of common stock before the completion of this offering. However, as each selling stockholder can offer all, some or none of its common stock, no definitive estimate can be given as to the number of shares that any selling stockholder will ultimately offer or sell under this prospectus.
(2)	Highbridge Capital Management, LLC is the trading manager of Highbridge International LLC and has voting control and investment discretion over the securities held by Highbridge International LLC. Glenn Dubin is the Chief Executive Officer of Highbridge Capital Management, LLC. Each of Highbridge Capital Management, LLC and Glenn Dubin disclaims beneficial ownership of the securities held by Highbridge International LLC.
(3)	Includes 90,476 shares issuable upon the exercise of warrants.
(4)	Dr. Nathan Fischel has voting and investment control over the shares held by the selling stockholder.
(5)	Includes 13,900 shares issuable upon the exercise of warrants.
(6)	Includes 15,000 shares issuable upon the exercise of warrants.
(7)	Includes 42,529 shares issuable upon the exercise of warrants.
(8)	Downsview Capital, Inc. (“Downsview”) is the general partner of Cranshire Capital, L.P. (“Cranshire”) and consequently has voting control and investment discretion over securities held by Cranshire. Mitchell P. Kopin (“Mr. Kopin”), President of Downsview, has voting control over Downsview. As a result, each of Mr. Kopin, Downsview and Cranshire may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended) of the shares owned by Cranshire which are being registered hereunder.
(9)	Includes 45,238 shares issuable upon the exercise of warrants.
(10)	Downsview Capital, Inc. (“Downsview”) is the investment manager for a managed account of Freestone Advantage Partners, LP and consequently has voting control and investment discretion over securities held in such account. Mitchell P. Kopin (“Mr. Kopin”), President of Downsview, has voting control over Downsview. As a result, each of Mr. Kopin and Downsview may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended) of the shares held in such account which are being registered hereunder.

(11)	Includes 2,380 shares issuable upon the exercise of warrants.
(12)	Rick Kung, President of 2035718 Ontario Inc., has investment control and voting control over the securities held by 2035718 Ontario Inc.
(13)	Includes 47,619 shares issuable upon the exercise of warrants.
(14)	Bristol Capital Advisors, LLC (“BCA”) is the investment advisor to Bristol Investment Fund, Ltd. (“Bristol”). Paul Kessler is the manager of BCA and as such has voting and investment control over the securities held by Bristol.
(15)	Includes 28,571 shares issuable upon the exercise of warrants.

(16) John Borer, Senior Managing Director of Rodman & Renshaw, LLC, has voting and investment control over the shares held by the selling stockholder.

(17) Includes 28,286 shares issuable upon the exercise of warrants.

(18) Includes 2,571 shares issuable upon the exercise of warrants.

(19) Includes 3,429 shares issuable upon the exercise of warrants.

(20) Robert A. Maley, President of Gilford Securities Incorporated, has voting and investment control over the shares held by the selling stockholder.

(21) Includes 10,000 shares issuable upon the exercise of warrants.

PLAN OF DISTRIBUTION

We are registering the shares of common stock that have been issued to the selling stockholders and the shares of common stock that are issuable upon exercise of the warrants to permit the resale of these shares of common stock by the holders of the shares of common stock and warrants from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the selling stockholders of the shares of common stock. We will bear all fees and expenses incident to our obligation to register the shares of common stock.

The selling stockholders may sell all or a portion of the shares of common stock held by them and offered hereby from time to time directly or through one or more underwriters, broker-dealers or agents. If the shares of common stock are sold through underwriters or broker-dealers, the selling stockholders will be responsible for underwriting discounts or commissions or agent's commissions. The shares of common stock may be sold in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale or at negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions, pursuant to one or more of the following methods:

- on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;
- in the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- through the writing or settlement of options, whether such options are listed on an options exchange or otherwise;
- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- short sales made after the date the Registration Statement is declared effective by the SEC;
- broker-dealers may agree with a selling security holder to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The selling stockholders may also sell shares of common stock under Rule 144 promulgated under the Securities Act of 1933, as amended, if available, rather than under this prospectus. In addition, the selling stockholders may transfer the shares of common stock by other means not described in this prospectus. If the selling stockholders effect such transactions by selling shares of common stock to or through underwriters, broker-dealers or agents, such

underwriters, broker-dealers or agents may receive commissions in the form of discounts, concessions or commissions from the selling stockholders or commissions from purchasers of the shares of common stock for whom they may act as agent or to whom they may sell as principal (which discounts, concessions or commissions as to particular underwriters, broker-dealers or agents may be in excess of those customary in the types of transactions involved). In connection with sales of the shares of common stock or otherwise, the selling stockholders may enter into hedging transactions with broker-dealers, which may in turn engage in short sales of the shares of common stock in the course of hedging in positions they assume. The selling stockholders may also sell shares of common stock short and deliver shares of common stock covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The selling stockholders may also loan or pledge shares of common stock to broker-dealers that in turn may sell such shares.

The selling stockholders may pledge or grant a security interest in some or all of the warrants or shares of common stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of common stock from time to time pursuant to this prospectus or any amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act amending, if necessary, the list of selling stockholders to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus. The selling stockholders also may transfer and donate the shares of common stock in other circumstances in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

To the extent required by the Securities Act and the rules and regulations thereunder, the selling stockholders and any broker-dealer participating in the distribution of the shares of common stock may be deemed to be "underwriters" within the meaning of the Securities Act, and any commission paid, or any discounts or concessions allowed to, any such broker-dealer may be deemed to be underwriting commissions or discounts under the Securities Act. At the time a particular offering of the shares of common stock is made, a prospectus supplement, if required, will be distributed, which will set forth the aggregate amount of shares of common stock being offered and the terms of the offering, including the name or names of any broker-dealers or agents, any discounts, commissions and other terms constituting compensation from the selling stockholders and any discounts, commissions or concessions allowed or re-allowed or paid to broker-dealers.

Under the securities laws of some states, the shares of common stock may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the shares of common stock may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

There can be no assurance that any selling stockholder will sell any or all of the shares of common stock registered pursuant to the registration statement, of which this prospectus forms a part.

The selling stockholders and any other person participating in such distribution will be subject to applicable provisions of the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder, including, without limitation, to the extent applicable, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the shares of common stock by the selling stockholders and any other participating person. To the extent applicable, Regulation M may also restrict the ability of any person engaged in the distribution of the shares of common stock to engage in market-making activities with respect to the shares of common stock. All of the foregoing may affect the marketability of the shares of common stock and the ability of any person or entity to engage in market-making activities with respect to the shares of common stock.

We will pay all expenses of the registration of the shares of common stock pursuant to the registration rights agreement, estimated to be $27,299.50 in total, including, without limitation, Securities and Exchange Commission filing fees and expenses of compliance with state securities or "blue sky" laws; provided, however, a selling stockholder will pay all underwriting discounts and selling commissions, if any. We will indemnify the selling stockholders against liabilities, including some liabilities under the Securities Act in accordance with the registration rights agreements or the selling stockholders will be entitled to contribution. We may be indemnified by the selling stockholders against civil liabilities, including liabilities under the Securities Act that may arise from any written information furnished to us by the selling stockholder specifically for use in this prospectus, in accordance with the related registration rights agreements or we may be entitled to contribution.

Once sold under the registration statement, of which this prospectus forms a part, the shares of common stock will be freely tradable in the hands of persons other than our affiliates.

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LEGAL MATTERS

The validity of the issuance of securities offered hereby will be passed upon for us by Ruskin Moscou Faltischek, P.C., of Uniondale, New York.

EXPERTS

The consolidated financial statements incorporated in this prospectus by reference from Bovie Medical Corporation's Annual Report on Form l0-K for the year ended December 31, 2009 have been audited by Kingery & Crouse, P.A, independent auditors, as stated in their report, which is incorporated herein by reference, and have been so incorporated in reliance upon the report of such firm given upon their authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at www.sec.gov. You may also read and copy any document we file at the SEC's public reference room at 100 F Street, N.E., Washington, D.C. 205409. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to incorporate by reference the information we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be a part of this prospectus, and information in documents that we file later with the SEC will automatically update and supersede the information in this prospectus. We incorporate by reference into this prospectus the documents listed below and any future filings we make with the SEC under Section 13(a), 13(c) 14 or 15(d) of the Securities Exchange Act of 1934, as amended, until this offering is completed and all securities are sold:

- Our Registration Statement on Form S-3 filed with the SEC on November 24, 2004;
- Our Current Report on Form 8-K filed with the SEC on March 8, 2010;
- Our Current Report on Form 8-K filed with the SEC on March 15, 2010;
- Our Annual Report on Form 10-K for the year ended December 31, 2009 filed with the SEC on March 16, 2010;
- Our Current Report on Form 8-K filed with the SEC on March 16, 2010;
- Our Current Report on Form 8-K filed with the SEC on April 20, 2010;
- Our Current Report on Form 8-K filed with the SEC on April 29, 2010; and
- Our quarterly report on Form 10-Q for the quarterly period ended March 31, 2010 filed with the SEC on May 10, 2010.

Upon request, Bovie will provide, free of charge, to each person to whom a prospectus is delivered, including a beneficial owner, a copy of any or all information that has been incorporated by reference in the prospectus but not delivered with the prospectus. Any such request may be made orally or in writing to Bovie Medical Corporation, 5115 Ulmerton Rd. Clearwater, Florida 33760, Attention: Gary Pickett, CFO, Tel. No.: (727) 803-8593.

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997,713 Shares
Common Stock

BOVIE MEDICAL CORPORATION

PROSPECTUS
June 7, 2010