

IsoRay, Inc.
Form 424B5
October 13, 2011

Filed pursuant to
Rule 424(b)(5)
File No. 333-162694

PROSPECTUS SUPPLEMENT
(To Prospectus dated November 13, 2009)

IsoRay, Inc.

2,500,000 Shares of Common Stock
And
Warrants to Purchase Up to 500,000 Shares of Common Stock

This is an underwritten offering on a best efforts, all-or-none basis of 2,500,000 shares of our common stock and warrants to purchase up to 500,000 shares of our common stock pursuant to this prospectus supplement and the accompanying prospectus. The common stock is being offered at a per share purchase price of \$0.92. Each purchaser in this offering will receive one warrant for every five shares of common stock purchased, exercisable at a price per share equal to 115% of the public offering price per share of common stock sold in this offering, expiring five years from the date of their original issuance. The shares of common stock and warrants will be issued separately but can only be purchased together in this offering. For a more detailed description of our warrants, see the section entitled "Description of the Warrants" beginning on page S-10. For a more detailed description of our common stock, see the section entitled "Description of Capital Stock" beginning on page 7 of the accompanying prospectus.

Our common stock is traded on the NYSE Amex under the symbol "ISR." On October 11, 2011, the closing price of our common stock on the NYSE Amex was \$0.95 per share.

The aggregate market value of our outstanding common stock held by non-affiliates was approximately \$32,512,420 based on 26,493,118 shares of outstanding common stock as of October 10, 2011, of which 26,009,936 shares were held by non-affiliates, and a per share price of \$1.25 based on the closing price of our common stock as quoted on the NYSE Amex on August 15, 2011.

As of the date hereof and excluding this offering, we have offered the following securities pursuant to General Instruction I.B.6. of Form S-3 during the prior twelve calendar month period that ends on, and includes, the date of this prospectus supplement: (i) 304,227 shares of common stock sold in our at-the-market offering under the same base prospectus for gross proceeds of \$368,781; (ii) 2,250,000 shares of common stock sold in our registered direct offering under the same base prospectus for gross proceeds of \$2,250,000; and (iii) warrants to purchase 3,479,167 shares of common stock sold in our registered direct offering under the same base prospectus for gross proceeds of \$636,616 for the warrants that have been exercised and with a market value of \$3,453,125, using the August 15, 2011 closing price of \$1.25, for the unexercised and unexpired warrants. Thus, during the period of 12 calendar months immediately prior to and including, the date of this prospectus, we have sold securities with an aggregate market value of \$6,708,522 pursuant to General Instruction I.B.6 of Form S-3. The securities being offered have an aggregate market value, based upon the offering price in the case of the shares of common stock and the market value in the case of the warrants, of \$4,126,793, assuming full exercise of the over-allotment option described below.

Investing in our securities involves a high degree of risk. Before buying any securities, you should read the discussion of material risks of investing in our securities referred to under the heading "Risk Factors" beginning on page S-7 of this prospectus supplement.

	Per share	Total
Public offering price	\$0.9200	\$2,300,000
Underwriting discounts and commissions (1)	\$0.0552	\$138,000
Proceeds, before expenses, to us	\$0.8648	\$2,162,000

(1) Excludes the warrants to be issued to the underwriters. See "Underwriting." Does not include any proceeds to be received from the exercise of the warrants, if any.

We expect the total offering expenses, excluding the underwriting discounts and commissions, to be approximately \$100,000 for all sales pursuant to this prospectus supplement and accompanying prospectus.

The underwriters are selling shares of the common stock and warrants offered in this prospectus supplement on a "best efforts" basis and are not required to sell any specific number or dollar amount of the securities offered by this prospectus supplement, but will use their best efforts to sell such securities. There is no arrangement for funds to be received in escrow, trust or similar arrangement. The underwriters may also sell to the public up to an additional 1,027,173 shares of our common stock and warrants to purchase up to an additional 205,435 shares of our common stock at the public offering price per share, less the underwriting discounts and commissions, to cover over-allotments, if any, within 45 days of the date of this prospectus supplement.

In connection with the offering of shares of our common stock and warrants under this prospectus supplement, we have also agreed to issue to the representatives of the underwriters and/or their designees warrants to purchase from us a number of shares of our common stock equal, in the aggregate, to 6% of the shares of our common stock sold in this offering (but not including any shares sold as part of the over-allotment), exercisable at a price per share equal to 115% of the public offering price per share of common stock sold in this offering, commencing six months from the closing date of the underwriting agreement and expiring five years from the date of their original issuance. The shares of our common stock issuable upon exercise of such warrants are identical to those offered by this prospectus supplement.

Delivery of the securities will be made to the purchaser on or about October 14, 2011, subject to customary closing conditions. The shares of common stock will be delivered in book-entry form through The Depository Trust Company, New York, New York. The warrants sold in this offering will be delivered directly to the purchasers.

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

WestPark Capital,
Inc.

ViewTrade
Securities, Inc.

The date of this prospectus supplement is October 13, 2011.

TABLE OF CONTENTS

Prospectus Supplement	
ABOUT THIS PROSPECTUS SUPPLEMENT	i
SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS	ii
INDUSTRY AND MARKET DATA	iii
PROSPECTUS SUPPLEMENT SUMMARY	S-1
RISK FACTORS	S-7
USE OF PROCEEDS	S-8
DETERMINATION OF OFFERING PRICE	S-9
DILUTION	S-9
DESCRIPTION OF THE SECURITIES WE ARE OFFERING	S-10
UNDERWRITING	S-11
LEGAL MATTERS	S-13
EXPERTS	S-14
WHERE YOU CAN FIND MORE INFORMATION	S-14
INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE	S-14
Prospectus	
ABOUT THIS PROSPECTUS	4
ABOUT ISORAY	4
RISK FACTORS	5
NOTE REGARDING FORWARD-LOOKING STATEMENTS	6
USE OF PROCEEDS	6
GENERAL DESCRIPTION OF SECURITIES	7
DESCRIPTION OF CAPITAL STOCK	7
DESCRIPTION OF THE WARRANTS	10
DESCRIPTION OF UNITS	12
UNDERWRITING	13
LEGAL MATTERS	15
EXPERTS	15
INTERESTS OF NAMED EXPERTS AND COUNSEL	16
MATERIAL CHANGES	16
WHERE YOU CAN FIND ADDITIONAL INFORMATION	16
INCORPORATION BY REFERENCE	16
COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITIES	17

ABOUT THIS PROSPECTUS SUPPLEMENT

A registration statement on Form S-3 (File No. 333-162694) utilizing a shelf registration process relating to the securities described in this prospectus supplement has been filed with the Securities and Exchange Commission, or the SEC, and was declared effective on November 13, 2009. Under this shelf registration process, of which this offering is a part, we may, from time to time, sell up to \$15,000,000 of common stock and other securities.

This document is in two parts. The first part is this prospectus supplement, which describes the specific 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 base prospectus, which gives more general information, some of which may not apply to this offering of our common stock and warrants. 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. Generally, when we refer to this "prospectus," we are referring to both documents combined, together with any free writing prospectus that we have authorized for use in connection with this offering.

You should rely only on the information contained in or incorporated by reference into this prospectus supplement and the accompanying prospectus. We have not, and the underwriters have not, authorized anyone to provide you with information that is different. This prospectus supplement is not an offer to sell or solicitation of an offer to buy these securities in any circumstances under which the offer or solicitation is unlawful. You should not assume that the information we have included in this prospectus supplement or the accompanying prospectus is accurate as of any date other than the date of this prospectus supplement or the accompanying prospectus, respectively, or that any information we have incorporated by reference is accurate as of any date other than the date of the document incorporated by reference, regardless of the time of delivery of this prospectus supplement or of any of our securities. It is important for you to read and consider all information contained in this prospectus supplement and the accompanying prospectus, including the documents incorporated by reference herein and therein, in making your investment decision. You should also read and consider the information in the documents we have referred you to in "Incorporation of Certain Documents by Reference" and "Where You Can Find More Information" in this prospectus supplement.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

All statements contained in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein, other than statements of historical facts, that address future activities, events or developments are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, which we refer to as the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, which we refer to as the Exchange Act. These statements often contain the words "may," "will," "believe," "expect," "anticipate," "intends," "estimate," "forecast," "project," and similar expressions, although not all forward-looking statements contain these words. All statements other than statements of historical fact are statements that could be deemed forward-looking statements, including statements relating but not limited to:

- projections of earnings, revenues or other financial items;
- plans and objectives of management for future operations;
- proposed new products or services;
- future operations, plans, regulatory filings or approvals;
- proposed new products or services, any statements regarding pending or future mergers or acquisitions; and
- future economic conditions or performance, and any statement of assumptions underlying any of the foregoing.

These statements are based on certain assumptions and analyses made by us in light of our experience and our assessment of historical trends, current conditions and expected future developments as well as other factors we believe are appropriate under the circumstances. However, whether actual results will conform to the expectations and predictions of management is subject to a number of risks and uncertainties that may cause actual results to differ materially.

You should not place undue reliance on our forward-looking statements because the matters they describe are subject to known and unknown risks, uncertainties and other unpredictable factors, many of which are beyond our control. Our forward-looking statements are based on the information currently available to us and speak only as of the date of this prospectus supplement, the date on the cover of the accompanying prospectus, or, in the case of forward-looking statements incorporated by reference, as of the date of the filing that includes the statement. New risks and uncertainties arise from time to time, and it is impossible for us to predict these matters or how they may affect us. Over time, our actual results, performance or achievements will likely differ from the anticipated results, performance or achievements that are expressed or implied by our forward-looking statements, and such difference might be

significant and materially adverse to our security holders. We do not undertake and specifically decline any obligation to update any forward-looking statements or to publicly announce the results of any revisions to any statements to reflect new information or future events or developments.

We have identified some of the important factors that could cause future events to differ from our current expectations and they are described in this prospectus supplement and the accompanying prospectus under the caption "Risk Factors" as well as in our most recent Annual Report on Form 10-K, including without limitation under the captions "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" and in other documents that we may file with the SEC, all of which you should review carefully. Please consider our forward-looking statements in light of those risks as you read this prospectus supplement and the accompanying prospectus.

INDUSTRY AND MARKET DATA

This prospectus supplement and the accompanying prospectus contain and incorporate by reference market data, industry statistics and other data that have been obtained from, or compiled from, information made available by third parties. Although we believe these third-party sources are reliable, we have not independently verified the information. Except as may otherwise be noted, none of the sources cited in this prospectus supplement or the accompanying prospectus has consented to the inclusion of any data from its reports, nor have we sought their consent. In addition, some data are based on our good faith estimates. Such estimates are derived from publicly available information released by independent industry analysts and third-party sources, as well as our own management's experience in the industry, and are based on assumptions made by us based on such data and our knowledge of such industry and markets, which we believe to be reasonable. However, none of our estimates have been verified by any independent source. See "Special Note Regarding Forward-Looking Statements" above.

PROSPECTUS SUPPLEMENT SUMMARY

This summary highlights selected information appearing elsewhere or incorporated by reference in this prospectus supplement and accompanying prospectus and may not contain all of the information that is important to you. This prospectus supplement and the accompanying prospectus include or incorporate by reference information about the securities we are offering as well as information regarding our business and detailed financial data. After you read this summary, you should read this prospectus supplement and the accompanying prospectus in their entirety, including the information incorporated by reference in this prospectus supplement and the accompanying prospectus, especially the section entitled "Risk Factors." If you invest in our securities, you are assuming a high degree of risk.

Unless the context requires otherwise, in this prospectus, the terms "IsoRay," the "Company," "we," "us," "our" and similar terms refer to IsoRay, Inc. and its operating subsidiary IsoRay Medical, Inc., and, to the extent applicable, its non-operating subsidiary, IsoRay International LLC.

BUSINESS OVERVIEW

In 2003, IsoRay obtained clearance from the FDA for treatment for all solid tumor applications using Cesium-131. Such applications include prostate cancer; ocular melanoma; head, neck and lung tumors; breast cancer; liver cancer; brain cancer; colorectal cancer; gynecological cancer; esophageal cancer; and pancreatic cancer. The seed may be used in surface, interstitial and intracavity applications for tumors with known radio sensitivity. Management believes its Cs-131 technology will allow it to become a leader in the brachytherapy market. Management believes that the IsoRay Proxcelan Cesium-131 brachytherapy seed represents the first major advancement in brachytherapy technology in over 21 years with attributes that could make it the long-term "seed of choice" for internal radiation therapy procedures.

IsoRay began production and sales of Proxcelan Cesium-131 brachytherapy seeds in October 2004 for the treatment of prostate cancer after clearance of its premarket notification (510(k)) by the Food and Drug Administration (FDA). In December 2007, IsoRay began selling its Proxcelan Cs-131 seeds for the treatment of ocular melanoma. In June 2009, the Company began selling its Proxcelan Cs-131 seeds for treatment of head and neck tumors, commencing with treatment of a tumor that could not be accessed by other treatment modalities. During the fiscal year ended June 30, 2010, the Company expanded the number of areas of the body in which the Proxcelan Cs-131 seeds were being utilized for treatment by adding lung cancer in August 2009, colorectal cancer in October 2009, and chest wall cancer in December 2009. During the fiscal year ended June 30, 2011, the Company continued the expansion in the number of areas of the body in which the Proxcelan Cs-131 seeds were being utilized through the addition of the treatment of brain cancer in September 2010 and the treatment of gynecological cancer in December 2010. The Company continues to expand the application of the Proxcelan Cesium-131 seed for other cancer treatment applications using both existing delivery systems and researching delivery systems other than those historically used by the Company.

In August 2009, IsoRay Medical received clearance from the FDA for its premarket notification (510(k)) for Proxcelan™ Cesium-131 brachytherapy seeds that are preloaded into bioabsorbable braided strands. This clearance permits the product to be commercially distributed for treatment of lung, head and neck tumors as well as tumors in other organs. While Cesium-131 brachytherapy seeds themselves have been cleared for treatment in all organs since 2003, this 510(k) allows Cesium-131 seeds to be delivered in a convenient and sterile format that can be implanted without additional seed loading by the facility. The 510(k) also clears the application of braided strands onto a bioabsorbable mesh matrix to further facilitate the implant procedure. In March 2011, the Company received clearance to commercially deliver Proxcelan™ Cesium-131 brachytherapy seeds that are preloaded into bioabsorbable braided strands into Europe. This clearance permits the product to be commercially distributed for treatment of lung,

head and neck tumors as well as tumors in other organs in Europe.

In August 2011, IsoRay Medical received clearance from the FDA for its premarket notification (510(k)) for the GliaSite® radiation therapy system. The GliaSite® radiation therapy system is the only FDA-cleared balloon catheter device used in the treatment of brain cancer. The product possesses an established reimbursement rate for application in both in-patient and out-patient settings. In order to receive this clearance, the Company has redeveloped this device in a configuration which is equivalent to, but possesses certain modifications to improve the performance and manufacturability of, the original device which received FDA clearance when manufactured by Hologic Inc., from which the Company licenses the intellectual property underlying the GliaSite® radiation therapy system.

S-1

Brachytherapy seeds are small devices used in an interstitial radiation procedure. The procedure has become one of the primary treatments for prostate cancer. The brachytherapy procedure places radioactive seeds as close as possible to (in or near) the cancerous tumor (the word "brachytherapy" means close therapy). The seeds deliver therapeutic radiation thereby killing the cancerous tumor cells while minimizing exposure to adjacent healthy tissue. This procedure allows doctors to administer a higher dose of radiation directly to the tumor. Each seed contains a radioisotope sealed within a welded titanium capsule. When brachytherapy is the only treatment (monotherapy), approximately 70 to 120 seeds are permanently implanted in the prostate in an outpatient procedure lasting less than one hour. The number of seeds used varies based on the size of the prostate and the activity level specified by the physician. When brachytherapy is combined with external beam radiation or intensity modulated radiation therapy (dual therapy), then approximately 40 to 80 seeds are used in the procedure. The isotope decays over time and eventually the seeds become inert. The seeds may be used as a primary treatment or in conjunction with other treatment modalities, such as chemotherapy, or as treatment for residual disease after excision of primary tumors. The number of seeds for other treatment sites will vary from as few as 8 to 16 to as many as 117 to 123 depending on the type of cancer, the location of the tumor being treated and the type of therapy being utilized.

Our Strategy

The key elements of IsoRay's strategy for fiscal year 2012 include:

Continue to introduce the Proxcelan Cesium-131 brachytherapy seed into the U.S. market for prostate cancer. Prostate cancer treatment represents the original and core business for the Company's Proxcelan Cesium-131 product. With five year data relating to biochemical (PSA) control of prostate cancer now presented to the prostate cancer field, IsoRay intends to continue to seek to increase the number of centers making the use of Proxcelan using its direct sales force. Because intermediate- to long-term follow-up data is required to convince clinicians and patients to consider any particular therapy for localized prostate cancer, the availability of five-year data with Proxcelan in the treatment of prostate cancer represents a significant milestone. IsoRay hopes to capture much of the incremental market growth if and when seed implant brachytherapy recovers market share from other treatments and to take market share from existing competitors.

Return Gliasite® radiation therapy system to market in the United States and European Union (EU). In June of 2010, the Company acquired exclusive worldwide distribution rights to the Gliasite® radiation therapy system, the only FDA-cleared balloon catheter device used in the treatment of brain cancer, from Hologic Inc. The product possesses an established reimbursement rate for both in-patient and out-patient settings. The Company has developed a device configuration equivalent to the original FDA-cleared device for which it submitted a 510(k). The FDA has notified the Company that the 510(k) submission has received clearance. The Company obtained the rights to manufacture the Iotrex solution (Iodine -125) for use in the Gliasite® radiation therapy system. The Company plans to contact previous users of the product and leverage significant existing clinical data related to the safety and effectiveness of the Gliasite system in order to restore Gliasite as a strong treatment option for patients suffering from primary and metastatic brain cancers.

Increase utilization of Cesium-131 in treatment of other solid tumor applications such as head and neck, lung, chest wall, and colorectal cancers. IsoRay Medical has clearance from the FDA for its premarket notification, (510(k)) for Proxcelan™ brachytherapy seeds that are preloaded into bioabsorbable braided strands and bioabsorbable braided strands attached to bioabsorbable mesh during fiscal year 2011. This order cleared the product for commercial distribution for treatment of lung and head and neck tumors as well as tumors in other organs. IsoRay has successfully launched an initiative to market its Proxcelan™ source in bioabsorbable carrier material as a lung cancer treatment. IsoRay will continue to explore licenses or joint ventures with other companies to develop the appropriate

technologies and therapeutic delivery systems for treatment of other solid tumors such as breast, liver, pancreas, and brain cancers.

S-2

Support clinical research and sustained product development. The Company plans to structure and support clinical studies on the therapeutic benefits of Cesium-131 for the treatment of solid tumors and other patient benefits. We are and will continue to support clinical studies with several leading radiation oncologists to clinically document patient outcomes, provide support for our product claims, and compare the performance of our seeds to competing seeds. IsoRay plans to sustain long-term growth by implementing research and development programs with leading medical institutions in the U.S. and other countries to identify and develop other applications for IsoRay's core radioisotope technology. The Company recently deployed a secure, regulatory environment compliant, online information system capable of large usable databases to participating investigators.

Over fiscal year 2011, three presentations were accepted by the American Brachytherapy Society describing Cesium-131 treatment of prostate and eye cancers. Five presentations were accepted by the annual meeting of the American Society for Radiation Oncology (ASTRO), and six publications were abstracted to the MEDLINE database of citations of the medical literature that reported patients treated with Cesium-131 for prostate cancer. The Company will continue to drive to increase the number of reports made to society meetings and the peer reviewed literature in order to continue to enhance the standing of its products in the scientific arena.

Management plans to continue to build on an increasing number of studies related to Cesium-131 therapy in the management of cancer that were published in the medical literature and presented at relevant oncology society meetings in fiscal year 2011. The publication and presentation of speculative and real-world data contribute to the acceptability of Cesium-131 in the oncologic marketplace, and discussion in the medico-scientific community of established and novel Cesium-131 applications is considered a prerequisite to expansion into untapped markets.

Chief among development initiatives being planned for fiscal year 2012 are applications for Proxcelan Cesium-131 sources as treatment for esophageal cancer and for delivering adjuvant radiation to the resection bed following lumpectomy for early stage breast cancer. Both initiatives will focus on deploying the Proxcelan Cesium-131 source in tandem with existing, FDA-cleared or approved devices that have already made significant inroads into the treatment of both esophageal and early stage breast cancers. While there exist potential regulatory and business hurdles to the introduction of these products, management believes that the treatments can be functionally accomplished through the co-administration of these cleared devices along with Proxcelan sources. Early stage clinical studies are being planned for both initiatives for fiscal year 2012.

Introduce Proxcelan Cesium-131 brachytherapy seeds to the European Union (EU) and Russian markets. Health Canada's Therapeutic Products Directorate has approved IsoRay's Class 3 Medical Device License Applications for Model CS-1 Proxcelan™ (Cesium-131) brachytherapy seeds and the Proxcelan™ Sterile Implant Devices containing Model CS-1 Seeds. This allows IsoRay to market its brachytherapy seeds and related preloaded brachytherapy seeds throughout Canada. In November 2009, the Company entered into a distribution agreement with Inter V Medical of Montreal, Quebec, Canada for exclusive rights to sell the Proxcelan Cesium-131 brachytherapy seed in Canada. Approval to market Cesium-131 seeds in Russia was also obtained in 2009; and the Company has an exclusive distribution agreement in place with a Russian distributor, UralDial LLC, to distribute Proxcelan Cesium-131 brachytherapy seeds in Russia, however, the economic downturn in Russia has slowed the Company's market penetration efforts. The Company is focusing on the Canadian and European Union (EU) markets until the Russian market recovers.

Maintain ISO 13485:2003 certification. In August 2008, the Company obtained its initial ISO 13485:2003 certification. This permitted the Company to register its products in Europe in 2008 and in Canada and Russia during fiscal year 2009. The ISO 13485:2003 certification demonstrates that the Company is in compliance with this internationally recognized quality standard and is valid for a three year period. In July 2011, the Company received a

recertification to ISO 13485:2003. This recertification was an important step as it allows the Company to continue to register its products in foreign markets that utilize this certification as part of their medical device approval processes.

S-3

OUR CORPORATE INFORMATION

Our principal executive offices are located at 350 Hills Street, Suite 106, Richland, Washington 99354, and our telephone number is (509) 375-1202. We maintain an Internet website at www.isoray.com. Information on or accessible through our website does not constitute part of this prospectus supplement and should not be relied upon in connection with making any investment decision with respect to the securities offered by this prospectus supplement.

Although our predecessor operating company was organized in 1998, IsoRay, Inc. was incorporated in 1983 in Minnesota and operated under the name Century Park Pictures Corporation until the merger with IsoRay Medical, Inc. on July 28, 2005.

S-4

THE OFFERING

The following is a brief summary of some of the terms of the offering and is qualified in its entirety by reference to the more detailed information appearing elsewhere in this prospectus supplement and the accompanying prospectus. For a more complete description of the terms of our common stock and the warrants, see the "Description of the Securities We Are Offering" section in this prospectus supplement.

Securities We Are Offering 2,500,000 shares of our common stock, par value \$0.001 per share, having an aggregate gross offering price of \$2,300,000 and warrants to purchase shares of common stock as described below, with each purchaser in the offering receiving a warrant to purchase one share of common stock for every five shares of common stock purchased.

Common Stock Outstanding Before This Offering 26,493,118 shares as of October 10, 2011

Common Stock To Be Outstanding After This Offering 28,993,118 shares, assuming no warrants offered hereby are exercised, and 29,493,118 shares assuming the maximum number of warrants issuable hereunder are issued and exercised (not including the underwriters' warrants) and no other shares of common stock are issued.

Warrants The Company will issue warrants (the "Warrants") exercisable for up to 500,000 shares of common stock. The exercise price of each of the Warrants will be equal to \$1.058. The Warrants will have exercise terms of five years from their original issuance date. This prospectus supplement also relates to the offering of the shares of common stock issuable upon exercise of the Warrants.

Market for the Warrants There is no established public trading market for the Warrants, and we do not expect a market to develop. In addition, we do not intend to apply for listing of the Warrants on any securities exchange.

Use of Proceeds We estimate that the net proceeds to us from this offering after expenses and commissions will be approximately \$2,062,000, excluding amounts that may be received from exercise of the Warrants. We intend to use the net proceeds from the sale of our shares of common stock offered by this prospectus supplement for general corporate purposes, including without limitation, capital expenditures and working capital needs. See "Use of Proceeds."

Risk Factors

Our business is subject to substantial risk. Please carefully consider the "Risk Factors" beginning on page S-7 of this prospectus supplement, page 5 of the accompanying prospectus and other information included and incorporated by reference in this prospectus supplement and the accompanying prospectus including, but not limited to, the "Risk Factors" in our Annual Report on Form 10-K for the fiscal year ended June 30, 2011, for a discussion of the factors you should consider carefully before deciding to purchase these securities. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business operations. You should be able to bear a complete loss of your investment.

Dividends

We have not paid any cash dividends on our common stock and currently intend to retain any earnings to fund our working capital needs and growth opportunities.

NYSE Amex Symbol ISR

S-5

Except as otherwise provided for herein, the information contained in this prospectus supplement assumes that none of the Warrants sold hereunder have been exercised.

The number of shares of our common stock outstanding before this offering is based on approximately 26,493,118 shares outstanding as of October 10, 2011 and excludes:

- 3,769,185 shares of common stock issuable upon the exercise of warrants outstanding at October 10, 2011 at a weighted average exercise price of \$3.72 per share;
- 59,065 shares of common stock issuable upon the conversion of preferred stock outstanding at October 10, 2011;
- 2,313,706 shares of common stock issuable upon the exercise of options outstanding at October 10, 2011 at a weighted average exercise price of \$1.83 per share; and
- 1,327,612 shares of common stock reserved for future stock option grants as of October 10, 2011 under our equity compensation plans.

Unless otherwise indicated, this prospectus supplement reflects and assumes no exercise by the underwriters of the over-allotment option described under "Underwriting."

RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully consider the risks listed below and other information included and incorporated by reference in this prospectus supplement and accompanying prospectus. There may also be risks of which we are currently unaware, or that we currently regard as immaterial based on the information available to us that later prove to be material. If any of these risks occur, our business, operating results and financial condition could be seriously harmed, the trading price of our common stock could decline, and you could lose some or all of your investment.

Risks Related to this Offering

The Price Of Our Common Stock May Be Adversely Affected By The Future Issuance And Sale Of Shares Of Our Common Stock Or Other Equity Securities. We cannot predict the size of future issuances or sales of our common stock or other equity securities, including those made pursuant to the Warrants purchased hereunder, future acquisitions or capital raising activities, or the effect, if any, that such issuances or sales may have on the market price of our common stock. The issuance and sale of substantial amounts of common stock or other equity securities or announcement that such issuances and sales may occur, could adversely affect the market price of our common stock.

Future Sales By Shareholders, Or The Perception That Such Sales May Occur, May Depress The Price Of Our Common Stock. The sale or availability for sale of substantial amounts of our shares in the public market, including shares issuable upon conversion of outstanding preferred stock or exercise of common stock warrants and options, or the perception that such sales could occur, could adversely affect the market price of our common stock and also could impair our ability to raise capital through future offerings of our shares. As of October 10, 2011, we had 26,493,118 outstanding shares of common stock, and the following additional shares were reserved for issuance: 2,313,706 shares upon exercise of outstanding options, 3,769,185 shares upon exercise of outstanding warrants, and 59,065 shares upon conversion of preferred stock. Any decline in the price of our common stock may encourage short sales, which could place further downward pressure on the price of our common stock and may impair our ability to raise additional capital through the sale of equity securities.

The Issuance Of Shares Upon Exercise Of Derivative Securities May Cause Immediate And Substantial Dilution To Our Existing Shareholders. The issuance of shares upon conversion of the preferred stock and the exercise of common stock warrants and options may result in substantial dilution to the interests of other shareholders since these selling shareholders may ultimately convert or exercise and sell all or a portion of the full amount issuable upon exercise. If all derivative securities were converted or exercised into shares of common stock, including the maximum number of Warrants issuable in this offering, there would be approximately an additional 6,641,956 shares of common stock outstanding as a result. Warrants to purchase approximately 2.8 million shares are exercisable at any time at approximately a ten percent (10%) discount to the market price at the time of the filing of this Prospectus Supplement. The issuance of these shares will have the effect of further diluting the proportionate equity interest and voting power of holders of our common stock.

Failure to Comply with NYSE Amex Listing Standards And Any Resulting Delisting Could Adversely Affect The Market For Our Common Stock. Our common stock is presently listed on the NYSE Amex. The NYSE Amex will consider delisting a company's securities if, among other things, the company fails to maintain minimum stockholder's equity or the company has sustained losses which are so substantial in relation to its overall operations or its existing financial resources, or its financial condition has become so impaired that it appears questionable, in the opinion of the NYSE Amex, as to whether such issuer will be able to continue operations and/or meet its obligations as they mature. We are unlikely to meet these minimum stockholders equity requirements for the quarter ended September 30, 2011 and thus we need to raise the capital being sought in this offering. There can be no assurance that we will be able to maintain our listing on the NYSE Amex indefinitely. In the event that our common stock is delisted from the NYSE Amex, trading, if any, in the common stock would be conducted in the over-the-counter market. As a result, our

shareholders would likely find it more difficult to dispose of, or to obtain accurate quotations as to the market value of, our common stock.

S-7

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 for listing the Warrants on any securities exchange or for quotation on the any securities market. Without an active market, the liquidity of the Warrants will be limited.

Since We Have Broad Discretion In How We Use The Proceeds From This Offering, We May Use The Proceeds In Ways In Which You Disagree. 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 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 our company. 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.

Purchasers Of The Shares And Purchasers Of The Warrants Who Exercise Their Warrants Will Incur Immediate Dilution. Purchasers of shares of common stock in this offering and purchasers who convert their Warrants into shares of common stock will experience immediate and substantial dilution because the purchase price of the common stock will be and the per share exercise price of the Warrants will likely be higher than the net tangible book value per share of the outstanding common stock immediately after this offering. In addition, purchasers will experience dilution, which may be substantial, when we issue additional shares of common stock that we are permitted or required to issue under options, warrants, our stock option plans or other employee or director compensation plans. In this offering, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us, you will experience immediate dilution of \$0.64 per share, representing the difference between our as adjusted net tangible book value per share as of June 30, 2011 after giving effect to this offering. See the section entitled "Dilution" below for a more detailed discussion of the dilution you will incur if you purchase common stock in this offering.

Holder Of The Warrants Will Have No Rights As Common Shareholders Until They Exercise Their Warrants But Will Receive Any Dividends. Until holders of the Warrants offered hereby acquire shares of our common stock upon exercise of the Warrants, they will have no rights with respect to our common stock but will be paid dividends upon exercise if any dividends are paid to shareholders of common stock. Upon exercise of the Warrants, holders will be entitled to exercise the rights of a common stockholder only as to matters for which the record date occurs after the exercise date.

USE OF PROCEEDS

Assuming we sell 2,500,000 shares of our common stock in this offering, we estimate that the net proceeds from the sale of the shares of common stock that we are offering hereby will be approximately \$2,062,000, or approximately \$2,950,300 if the underwriters exercise in full their over-allotment option to purchase additional shares of common stock based on the public offering price of \$0.92 per share, after deducting the underwriting discounts and commissions and the estimated offering expenses payable by us and assuming that we sell all of the shares and Warrants offered hereunder but none of the Warrants are exercised.

We intend to use the net proceeds from the sale of our shares of common stock offered by this prospectus supplement for general corporate purposes, including without limitation capital expenditures and working capital needs, as described below:

Capital equipment for new applications/research and development	\$ 100,000
Working capital	1,962,000

Total

\$2,062,000

S-8

Although we have identified some of the potential uses of the proceeds from this offering, we have and reserve broad discretion in the application of these proceeds. Accordingly, we reserve the right to use these proceeds for different purposes or uses which we have not listed above, particularly if there is a change in demand for certain applications of our Cesium-131 and other products which may require increased investment in protocols and research studies and the hiring of additional sales staff. See "Risk Factors – Since We Have Broad Discretion In How We Use The Proceeds From This Offering, We May Use The Proceeds In Ways In Which You Disagree."

Based on our current plans, we believe that our net proceeds from this offering, together with our existing cash, cash equivalents and restricted cash will be sufficient to fund our anticipated operating expenses and capital expenditures at least through fiscal year 2012.

Pending any ultimate use of any portion of the proceeds from this offering, we intend to invest the proceeds in short – and medium – term interest-bearing obligations, investment-grade instruments, certificates of deposit or direct or guaranteed obligations of the U.S. government.

Proceeds from the exercise of the Warrants being sold through this offering are estimated to be \$529,000, or \$746,000 if the over-allotment is fully sold, assuming all Warrants are exercised using cash, and with the maximum possible number of Warrants being exercised, and may be received by the Company at any time following the offering depending on when and if the Warrants are exercised by investors. We will not receive any proceeds from the Warrants unless and until the Warrants are exercised for cash. These proceeds when and if received are expected to be used for general corporate purposes, including without limitation, capital expenditures and working capital needs. The amounts and timing of our use of proceeds from the Warrants will vary depending on a number of factors, including when the Warrants are exercised, the amount of cash generated or used by our operations, and the rate of growth, if any, of our business. As a result, we will retain broad discretion in the allocation of the proceeds that we receive upon exercise of the Warrants. In addition, while we have not entered into any agreements, commitments or understandings relating to any significant transaction as of the date of this prospectus supplement, we may use a portion of the proceeds to pursue acquisitions, joint ventures and other strategic transactions.

DETERMINATION OF OFFERING PRICE

We will sell our common stock in this offering at a negotiated price of \$0.92 per share of common stock. Each purchaser of five shares of our common stock will receive a Warrant to purchase one share of common stock as described under "Description of the Warrants" below, at an exercise price of \$1.058. Prior to this offering, there was no public market for the Warrants. The terms and conditions of the Warrants, including their exercise price, were determined by negotiation by us and the underwriters. The principal factors considered in determining the terms and conditions of the sale of our Securities hereunder include:

- the market price of our common stock;
- the recent market prices of, and demand for, publicly traded common stock and warrants to purchase publicly traded common stock of generally comparable companies; and
- other factors deemed relevant by the underwriters and us.

DILUTION

Our net tangible book value on June 30, 2011 was approximately \$6,175,334 or approximately \$0.23 per share. "Net tangible book value" is total assets minus the sum of liabilities and intangible assets. "Net tangible book value per share" is net tangible book value divided by the total number of shares of common stock outstanding at June 30, 2011.

S-9

Net tangible book value dilution per share to new investors represents the difference between the amount per share paid by purchasers of shares of common stock in this offering and the net tangible book value per share of our common stock immediately after completion of this offering. Assuming we sell shares of our common stock in this offering at the public offering price of \$0.92 per share and after deducting the underwriting discounts and commissions and estimated offering expenses payable by us, our as adjusted net tangible book value as of June 30, 2011 would have been \$0.28 per share. This amount represents an immediate increase in net tangible book value of \$0.05 per share to existing shareholders and an immediate dilution of \$0.64 per share to purchasers of common stock in this offering at the assumed public offering price, as illustrated in the following table:

Public offering price per share, net of offering costs	\$0.92
Net tangible book value per share as of June 30, 2011	\$0.23
Increase in net tangible book value per share attributable to this offering	\$0.05
Pro forma net tangible book value per share as of June 30, 2011 after giving effect to this offering	\$0.28
Dilution per share to new investors in this offering	\$0.64

The table above excludes, as of June 30, 2011, the following securities:

- Up to 500,000 shares of common stock issuable upon the exercise of the warrants offered hereunder;
- 3,769,185 shares of common stock issuable upon the exercise of warrants with a weighted average exercise price of \$3.72;
- 59,065 shares of common stock issuable upon the conversion of preferred stock;
- 2,313,706 shares of common stock issuable upon the exercise of options with a weighted average exercise price of \$1.83; and
- 1,372,612 shares of common stock reserved for future stock option grants under our equity compensation plans.

If the underwriters exercise in full the over-allotment option to purchase 1,027,173 shares of common stock offered in this offering at the public offering price of \$0.92 per share, the as adjusted net tangible book value after this offering would be \$0.32 per share, representing an increase in net tangible book value of \$0.09 per share to existing stockholders and immediate dilution in net tangible book value of \$0.60 per share to new investors purchasing our common stock in this offering at the public offering price.

To the extent that any of these options, warrants and convertible securities are exercised or converted, there may be further dilution to new investors.

DESCRIPTION OF THE SECURITIES WE ARE OFFERING

In this offering, we are offering 2,500,000 shares of our common stock (with an over-allotment option for an additional 1,027,173 shares), sold at \$0.92 per share, and Warrants as further described below. The shares and Warrants are immediately separable and will be issued separately. The shares of common stock issuable from time to

time upon exercise of the Warrants, if any, are also being offered pursuant to this prospectus supplement and the accompanying prospectus.

Description of the Common Stock

A description of the common stock we are offering pursuant to this prospectus supplement is set forth under the heading "Description of Capital Stock," starting on page 7 of the accompanying prospectus. As of October 10, 2011, we had 26,493,118 shares of common stock outstanding.

S-10

Description of the Warrants

The material terms and provisions of the Warrants being offered pursuant to this prospectus supplement and the accompanying prospectus are summarized below. This summary is subject to, and qualified in its entirety by, the form of Warrant to be filed as an exhibit to our current report on Form 8-K, to be filed with the SEC following the pricing of this offering.

Exercise and Duration. The Warrants will be exercisable to purchase an aggregate of 500,000 shares of common stock (with an over-allotment option for warrants to purchase up to an additional 205,435 shares of our common stock) at an exercise price of \$1.058 per share, subject to adjustment as summarized below, and will be immediately exercisable until the close of business on the five-year anniversary of the original issuance.

Registration. Certificates for the Warrants will be issued in fully registered form and a register of holders will be maintained at our principal offices in Richland, Washington. One or more certificates may be exchanged for one or more certificates of different denominations evidencing in the aggregate the same number of Warrants, as the certificates being exchanged.

Adjustment of Exercise Price. The exercise price of the Warrants will be subject to adjustment in the event of a subdivision or combination of our common stock, or in the event of a stock dividend on our common stock or other distribution on any class of common stock or other equity or equity equivalent security that is payable in shares of common stock or upon an issuance by reclassification of shares of our common stock any shares of capital stock of the Company. Simultaneously with any of the aforementioned adjustments to the exercise price of a Warrant, the number of shares of common stock that may be purchased upon exercise of the Warrants will be increased or decreased proportionately, so that the aggregate exercise price payable under the Warrants will remain the same. The exercise price of the Warrants will also be subject to adjustment if we make a dilutive issuance or a pro rata distribution to our shareholders of property or assets, including but not limited to evidences of indebtedness, securities and rights or warrants to subscribe for or purchase securities.

Fundamental Transactions. We will not enter into or be party to a fundamental transaction, which is a merger or other change of control transaction, as described in the Warrants, unless the successor entity, as described in the Warrants, assumes the Warrants and delivers new warrants that are substantially similar. If we enter into, or are a party to, a fundamental transaction pursuant to which our shareholders are entitled or required to receive securities issued by another company or cash or other assets in exchange for our common stock, which we refer to as a corporate event, a holder of a Warrant will have the right to receive, upon exercise of the Warrant, consideration as if such holder had exercised the Warrant immediately prior to such corporate event.

Fractional Shares. To the extent that a holder of Warrants would otherwise be entitled to purchase a fraction of a share of our common stock, we may, at our option, either pay a cash adjustment in respect of such final fraction or round up the fraction to the nearest whole share.

Transferability. Subject to applicable laws, the Warrants may be transferred at the option of the holders upon surrender of the Warrants to us together with the appropriate instruments of transfer.

No Rights as Shareholders. Holders of the Warrants do not have any voting or pre-emptive rights or any other rights as our shareholders prior to the exercise of the Warrants.

There is no established trading market through which the Warrants may be sold and purchasers may not be able to resell the Warrants purchased under this prospectus supplement and the accompanying prospectus. This may affect the pricing of the Warrants in the secondary market, the transparency and availability of trading prices, the liquidity of the Warrants, and the extent of issuer regulation. See "Risk Factors" above.

UNDERWRITING

Subject to the terms and conditions set forth in the underwriting agreement by and between us and WestPark Capital, Inc., as representative of the underwriters, we have agreed to issue and sell to the public through the underwriters named below, the respective number of shares of common stock set forth opposite each underwriter's name in the table below. WestPark Capital, Inc. is acting as managing underwriter for this offering.

Underwriter	Number of Shares
WestPark Capital, Inc.	2,000,000
ViewTrade Securities, Inc.	500,000
Total	2,500,000

S-11

This offering will be underwritten on a best efforts, all-or-none basis. The underwriters are under no obligation to purchase any shares of common stock and Warrants for their own account. As a “best efforts” offering, there can be no assurance that the offering contemplated hereby will ultimately be consummated. The underwriters may, but are not obligated to, retain other selected dealers that are qualified to offer and sell the shares and that are members of the Financial Industry Regulatory Authority.

In the underwriting agreement, the underwriters have agreed, subject to the terms and conditions set forth therein, to offer and sell to the public the shares of common stock and Warrants being sold pursuant to this prospectus supplement at a price per share equal to the public offering price less the underwriting discount specified on the cover page of this prospectus supplement. According to the terms of the underwriting agreement, the underwriters either will sell to the public all of the shares and Warrants or none of them. There is no arrangement for funds to be received in escrow, trust or similar arrangement.

The underwriters have an option to sell to the public up to 1,027,173 additional shares of common stock and warrants to purchase up to an additional 205,435 shares of our common stock from us to cover sales of shares by the underwriters which exceed the number of shares specified in the table above. The underwriters may exercise this option at any time and from time to time during the 45-day period from the date of this prospectus supplement. If any additional shares of common stock are purchased, the underwriters will offer the additional shares of common stock on the same terms as those on which the shares are being offered.

The underwriting agreement provides that the obligations of the underwriters are subject to certain conditions precedent, including the absence of any material adverse change in our business and the receipt of customary legal opinions, letters and certificates.

The underwriters may reject any order to purchase shares and Warrants in whole or in part. The underwriters expect that we will deliver the shares to the purchasers through the facilities of The Depository Trust Company in New York, New York on or about October 14, 2011, with the Warrants being delivered directly to the purchasers. At that time, the purchasers will pay us for the shares in immediately available funds.

The following table summarizes the compensation to be paid by us to the underwriters.

	Per Share	Total
Public Offering Price	\$0.9200	\$2,300,000
Underwriting Discounts and Commissions	\$0.0552	\$138,000
Proceeds before expenses	\$0.8648	\$2,162,000

The expenses of the offering, not including the underwriting discount and commissions, payable by us are estimated to be \$100,000, which includes \$25,000 that we have agreed to reimburse the underwriters for certain fees and legal expenses incurred by them in connection with this offering. We have also agreed to reimburse the underwriters for certain other reasonable third-party costs, fees and expenses.

In connection with the offering of shares of our common stock and warrants under this prospectus supplement, we have also agreed to issue to the representatives of the underwriters and/or their designees warrants to purchase from us a number of shares of our common stock equal, in the aggregate, to 6% of the shares of our common stock sold in this offering (but not including any shares sold as part of the over-allotment), exercisable at a price per share equal to 115% of the public offering price per share of common stock sold in this offering, commencing six months from the closing date of the underwriting agreement and expiring five years from the date of their original issuance. The shares of our common stock issuable upon exercise of such warrants are identical to those offered by this prospectus supplement.

We have agreed to indemnify the underwriters and their controlling persons against certain liabilities for misstatements in the registration statement of which this prospectus supplement forms a part, including liabilities under the Securities Act of 1933, as amended, or to contribute to payments the underwriters may be required to make in respect thereof.

The representatives have informed us that the underwriters intend to deliver all copies of this prospectus supplement via electronic means, via hand delivery or through mail or courier services.

In connection with this offering, the underwriters and other persons participating in this offering may engage in transactions which affect the market price of the common stock. These may include stabilizing transactions. Stabilizing transactions consist of bids or purchases for the purpose of pegging, fixing or maintaining the price of the common stock. These transactions, which may be effected on the NYSE Amex or otherwise, may stabilize, maintain or otherwise affect the market price of the common stock and could cause the price to be higher than it would be without these transactions. The underwriters and other participants in this offering are not required to engage in any of these activities and may discontinue any of these activities at any time without notice. We and the underwriters make no representation or prediction as to whether the underwriters will engage in such transactions or choose to discontinue any transactions engaged in or as to the direction or magnitude of any effect that these transactions may have on the price of the common stock.

This prospectus supplement and the accompanying prospectus may be made available in electronic format on websites or through other online services maintained by the underwriters, or by an affiliate. Other than this prospectus supplement and the accompanying prospectus in electronic format, the information on the underwriters' website and any information contained in any other websites maintained by the underwriters is not part of this prospectus supplement or the accompanying prospectus or the registration statement of which this prospectus supplement and the accompanying prospectus forms a part, has not been approved and/or endorsed by us or the underwriters.

The foregoing does not purport to be a complete statement of the terms and conditions of the underwriting agreement. A copy of the underwriting agreement will be included as an exhibit 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" below.

One or more of the underwriters currently act as a market maker for our common stock and may engage in "passive market making" in such securities on the NYSE Amex in accordance with Rule 103 of Regulation M under the Exchange Act. Rule 103 permits, upon the satisfaction of certain conditions, underwriters participating in a distribution that are also NYSE Amex market makers in the security being distributed to engage in limited market making transactions during the period when Regulation M would otherwise prohibit such activity. Rule 103 prohibits underwriters engaged in passive market making generally from entering a bid or effecting a purchase price that exceeds the highest bid for those securities displayed on the NYSE Amex by a market maker that is not participating in the distribution. Under Rule 103, each underwriter engaged in passive market making is subject to a daily net

purchase limitation equal to the greater of (i) 30% of such entity's average daily trading volume during the two full calendar months immediately preceding, or any consecutive 60 calendar days ending within the ten calendar days preceding, the date of the determination of the offering price of the common stock to be distributed or (ii) 200 shares of common stock.

S-13

The underwriters and their respective affiliates may provide various investment banking, financial advisory and other services to us and our affiliates for which services they have received, and may in the future receive, customary fees. In the course of their businesses, the underwriters and their respective affiliates may actively trade our securities or loans for their own account or for the accounts of customers, and, accordingly, the underwriters and their respective affiliates may at any time hold long or short positions in such securities or loans.

The transfer agent for our common shares to be issued in this offering is Computershare Trust Company. Our common shares are traded on the NYSE AMEX equities exchange under the symbol "ISR".

LEGAL MATTERS

The validity of the issuance of the securities offered by this prospectus supplement and the accompanying prospectus will be passed upon for us by Keller Rohrback, PLC, Phoenix, Arizona. Certain members of Keller Rohrback, PLC hold common stock of the Company, which in the aggregate equal less than one-quarter of a percent (0.25%) of the total issued and outstanding shares of our common stock. Greenberg Traurig P.A., Boca Raton, Florida, is acting as counsel for the underwriters in connection with this offering.

EXPERTS

The financial statements incorporated by reference in this prospectus supplement have been so incorporated by reference in reliance upon the report of DeCoria, Maichel & Teague, P.S., independent registered public accountants, upon the authority of said firm as experts in accounting and auditing in giving said reports.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus supplement and accompanying prospectus constitute a part of a registration statement on Form S-3 that we filed with the SEC under the Securities Act of 1933, as amended. We refer you to this registration statement for further information about us, our common stock and the Warrants to purchase our common stock offered hereby.

We file annual, quarterly and special reports and other information with the SEC (Commission File Number 001-33407). These filings contain important information that does not appear in this prospectus supplement or the accompanying prospectus. For further information about us, you may read and copy any reports, statements and other information filed by us at the SEC's Public Reference Room at 100 F Street, N.E., Room 1580, Washington, D.C. 20549-0102. You may obtain further information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. Our SEC filings are also available on the SEC Internet site at <http://www.sec.gov>, which contains periodic reports and other information regarding issuers that file electronically.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to "incorporate by reference" into this prospectus the information we file with it. This means that we can disclose important information to you by referring you to those documents. The information we incorporate by reference is considered to be a part of this prospectus, and later information we file with the SEC will automatically update and supersede this information. The following documents filed with the SEC (in each case, under our Commission File No. 001-33407) are incorporated by reference in this prospectus:

(a) Our Annual Report on Form 10-K for the fiscal year ended June 30, 2011 (filed September 28, 2011), which contains audited financial statements for our latest fiscal year for which such statements have been filed.

S-14

(b) The description of our common stock contained in our Registration Statement on Form 8-A, filed with the Commission on April 12, 2007, including any amendments or reports filed for the purpose of updating such description.

We are also incorporating by reference any future filings we make with the SEC under Section 13(a), 13(c), 14 or 15(d) of the Exchange Act until this offering is completed, including those made between the date of filing of the initial registration statement and prior to effectiveness of the registration statement, except for information furnished under Item 2.02 or Item 7.01 of our Current Reports on Form 8-K which is not deemed to be filed and not incorporated by reference herein.

We will provide, without charge, to each person to whom a copy of this prospectus has been delivered, upon written or oral request of such person, a copy of any or all of the documents incorporated by reference herein (other than certain exhibits to such documents not specifically incorporated by reference). Requests for such copies should be directed to: IsoRay, Inc., 350 Hills Street, Suite 106, Richland, Washington 99354, telephone number (509) 375-1202, Attention: Brien Ragle, Controller.

S-15

ISORAY, INC.

\$15,000,000

Common Stock
Warrants

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission using a "shelf" registration process. We may offer and sell any combination of our common stock and warrants described in this prospectus, separately or as units, in one or more offerings from time to time and at prices and on terms to be determined at or prior to the time of the applicable offering. The aggregate initial offering price of all securities sold under this prospectus by us will not exceed \$15,000,000. We may offer and sell these securities to or through one or more underwriters, dealers, and agents, or directly to purchasers, on a continuous or delayed basis. If any agents or underwriters are involved in the sale of any of these securities, the applicable prospectus supplement will provide the names of the agents and underwriters and any applicable fees, commissions or discounts.

This prospectus describes the general terms of these securities. We will provide the specific terms of these securities in supplements to this prospectus. The prospectus supplement may also add, update or change information in this prospectus. You should read this prospectus and any prospectus supplement, as well as the documents incorporated by reference or deemed to be incorporated by reference into this prospectus, carefully before you invest. This prospectus may not be used to offer or sell securities unless accompanied by a prospectus supplement.

Our principal executive offices are located at 350 Hills Street, Suite 106, Richland, Washington 99354, and our telephone number is (509) 375-1202.

Our common stock is listed on the NYSE Amex Stock Exchange under the symbol "ISR." As of October 15, 2009, the aggregate market value of our outstanding Common Stock held by non-affiliates was approximately \$25,198,765, based on 22,942,088 shares of outstanding Common Stock, of which 22,500,906 shares were held by non-affiliates, and a per share price of \$1.1199 based on the closing price of our Common Stock as quoted on the NYSE Amex on October 15, 2009. As of the date hereof, we have not offered any securities pursuant to General Instruction I.B.6. of Form S-3 during the prior twelve calendar month period that ends on, and includes, the date of this prospectus. Each prospectus supplement will contain information, where applicable, as to any listing on the NYSE Amex or any other securities exchange of the securities covered by the prospectus supplement.

Investing in the securities we may offer involves various risks. See the sections entitled "Risk Factors" on page 2 and "Note Regarding Forward-Looking Statements" on page 3. Additional risks associated with an investment in us as well as with the particular types of securities will be described in the related prospectus supplement and certain of our filings with the Securities and Exchange Commission.

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 __, 2009.

TABLE OF CONTENTS

	Page
ABOUT THIS PROSPECTUS	1
ABOUT ISORAY	1
RISK FACTORS	2
NOTE REGARDING FORWARD-LOOKING STATEMENTS	3
USE OF PROCEEDS	3
GENERAL DESCRIPTION OF SECURITIES	4
DESCRIPTION OF CAPITAL STOCK	4
DESCRIPTION OF THE WARRANTS	7
DESCRIPTION OF UNITS	9
UNDERWRITING	10
LEGAL MATTERS	12
EXPERTS	12
INTERESTS OF NAMED EXPERTS AND COUNSEL	13
MATERIAL CHANGES	13
WHERE YOU CAN FIND ADDITIONAL INFORMATION	13
INCORPORATION BY REFERENCE	13
COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITIES	14

The registration statement, including the exhibits and the documents incorporated herein by reference, can be read on the Securities and Exchange Commission website at the Securities and Exchange Commission offices mentioned under the heading "Where You Can Find More Information."

Until _____, all dealers that effect transactions in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to the dealers' obligation to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

ABOUT THIS PROSPECTUS

You should rely only on the information contained or incorporated by reference in this prospectus. We have not authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted. You should not assume that the information in this prospectus is accurate as of any date other than the date on the front cover of this prospectus. You should not assume that the information incorporated by reference in this prospectus is accurate as of any date other than the date the respective information was filed with the Securities and Exchange Commission. Our business, financial condition, results of operations and prospects may have changed since those dates.

This prospectus is part of a registration statement that we have filed with the Securities and Exchange Commission, or the SEC, using a "shelf" registration process. Under this shelf registration process, we may offer from time to time up to \$15,000,000 in the aggregate, inclusive of any exercise price thereof, of the following securities:

- shares of our common stock;
- warrants to purchase shares of our common stock; or
- any combination of the foregoing, separately or as units.

This prospectus provides you with a general description of the securities we may offer. Each time we offer securities, we will provide you with a prospectus supplement that describes the specific amounts, prices and terms of the securities we may offer. The prospectus supplement also may add, update or change information contained in this prospectus. You should read carefully both this prospectus and any prospectus supplement together with additional information described below under "Information Incorporated By Reference."

This prospectus does not contain all the information provided in the registration statement we filed with the SEC. For further information about us or the securities offered hereby, you should refer to that registration statement, which you can obtain from the SEC as described below under "Where You Can Find More Information."

Pursuant to General Instruction I.B.6. of Form S-3, we are permitted to use the registration statement of which this prospectus forms a part to sell, via a primary offering, a maximum amount of securities equal to one-third of the aggregate market value of our outstanding voting and non-voting common equity held by non-affiliates of our company in any twelve month period.

We may sell the securities to or through underwriters, dealers or agents or directly to purchasers. We and our agents reserve the sole right to accept or reject in whole or in part any proposed purchase of securities. The prospectus supplement, which we will provide to you each time we offer securities, will set forth the names of any underwriters, dealers or agents involved in the sale of the securities, and any applicable fee, commission or discount arrangements with them. See "Underwriting."

ABOUT ISORAY

In this prospectus, the terms "IsoRay," the "Company," "we," "us," "our" and similar terms refer to IsoRay, Inc. and its operating subsidiary IsoRay, Medical, Inc. , and, to the extent applicable, its non-operating subsidiary, IsoRay International LLC.

In 2003, IsoRay obtained clearance from the FDA for treatment for all solid tumor applications using Cesium-131 (Cs-131). Such applications include prostate cancer; ocular melanoma; head, neck and lung tumors; and breast, liver, brain and pancreatic cancer. The seed may be used in surface, interstitial and intracavity applications for tumors with known radio sensitivity. Management believes its Cs-131 technology will allow it to become a leader in the brachytherapy market. Management believes that the IsoRay Proxcelan Cesium-131 brachytherapy seed represents the first major advancement in brachytherapy technology in over 21 years with attributes that could make it the long-term "seed of choice" for internal radiation therapy procedures.

IsoRay began production and sales of Proxcelan Cesium-131 brachytherapy seeds in October 2004 for the treatment of prostate cancer after clearance of its premarket notification (510(k)) by the Food and Drug Administration (FDA). In December 2007, IsoRay began selling its Proxcelan Cs-131 seeds for the treatment of ocular melanoma. On June 1, 2009, the Company again expanded its application of Cs-131 with the treatment of a head and neck tumor that could not be accessed by other treatment modalities. More recently the Company has focused on other applications which require revising the delivery system from those historically used by the Company.

In August 2009, IsoRay Medical received clearance from the FDA for its Premarket Notification (510(k)) for Proxcelan™ Cesium-131 brachytherapy seeds that are preloaded into bioabsorbable braided strands. This clearance permits the product to be commercially distributed for treatment of lung, head and neck tumors as well as tumors in other organs. While Cs-131 brachytherapy seeds themselves have been cleared for treatment in all organs since 2003, this 510(k) allows Cs-131 seeds to be delivered in a convenient and sterile format that can be implanted without additional seed loading by the facility. The 510(k) also clears the application of braided strands onto a bioabsorbable mesh matrix to further facilitate the implant procedure.

Brachytherapy seeds are small devices used in an interstitial radiation procedure. The procedure has become one of the primary treatments for prostate cancer. The brachytherapy procedure places radioactive seeds as close as possible to (in or near) the cancerous tumor (the word "brachytherapy" means close therapy). The seeds deliver therapeutic radiation thereby killing the cancerous tumor cells while minimizing exposure to adjacent healthy tissue. This procedure allows doctors to administer a higher dose of radiation directly to the tumor. Each seed contains a radioisotope sealed within a welded titanium capsule. When brachytherapy is the only treatment (monotherapy), approximately 70 to 120 seeds are permanently implanted in the prostate in an outpatient procedure lasting less than one hour. The number of seeds used varies based on the size of the prostate and the activity level specified by the physician. When brachytherapy is combined with external beam radiation or intensity modulated radiation therapy (dual therapy), then approximately 40-80 seeds are used in the procedure. The isotope decays over time and eventually the seeds become inert. The seeds may be used as a primary treatment or in conjunction with other treatment modalities, such as chemotherapy, or as treatment for residual disease after excision of primary tumors. The number of seeds for other treatment sites will vary from as few as 10-12 to as many as 80-100 depending on the location of the tumor being treated.

More comprehensive information about us is available through our Internet website at <http://www.isoray.com>. The information on our website is not incorporated by reference into this prospectus. Our executive offices are located at 350 Hills Street, Suite 106, Richland, Washington 99354, and our telephone number is (509) 375-1202.

RISK FACTORS

An investment in our securities involves a high degree of risk. Before making an investment decision, you should carefully consider the risks described under "Risk Factors" in the applicable prospectus supplement and in our most recent Annual Report on Form 10-K, or any updates in our Quarterly Reports on Form 10-Q, together with all of the other information appearing in this prospectus or incorporated by reference into this prospectus and any applicable prospectus supplement, in light of your particular investment objectives and financial circumstances. The risks so described are not the only risks facing our company. Additional risks not presently known to us or that we currently deem immaterial may also impair our business operations. Our business, financial condition or results of operations could be materially adversely affected by any of these risks. The trading price of our securities could decline due to any of these risks, and you may lose all or part of your investment.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

In addition to historical information, this prospectus, any prospectus supplement and the documents incorporated by reference herein contain certain "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995 (PSLRA). This statement is included for the express purpose of availing IsoRay, Inc. of the protections of the safe harbor provisions of the PSLRA.

All statements contained in this prospectus, any prospectus supplement and the documents incorporated by reference herein, other than statements of historical facts, that address future activities, events or developments are forward-looking statements, including, but not limited to, statements containing the words "believe," "expect," "anticipate," "intends," "estimate," "forecast," "project," and similar expressions. All statements other than statements of historical fact are statements that could be deemed forward-looking statements, including any statements of the plans, strategies and objectives of management for future operations; any statements concerning proposed new products, services, developments or industry rankings; any statements regarding future revenue, economic conditions or performance; any statements of belief; and any statements of assumptions underlying any of the foregoing. These statements are based on certain assumptions and analyses made by us in light of our experience and our assessment of historical trends, current conditions and expected future developments as well as other factors we believe are appropriate under the circumstances. However, whether actual results will conform to the expectations and predictions of management is subject to a number of risks and uncertainties that may cause actual results to differ materially.

You should not place undue reliance on our forward-looking statements because the matters they describe are subject to known and unknown risks, uncertainties and other unpredictable factors, many of which are beyond our control. Our forward-looking statements are based on the information currently available to us and speak only as of the date on the cover of this prospectus, the date of any prospectus supplement, or, in the case of forward-looking statements incorporated by reference, as of the date of the filing that includes the statement. New risks and uncertainties arise from time to time, and it is impossible for us to predict these matters or how they may affect us. Over time, our actual results, performance or achievements will likely differ from the anticipated results, performance or achievements that are expressed or implied by our forward-looking statements, and such difference might be significant and materially adverse to our security holders. We do not undertake and specifically decline any obligation to update any forward-looking statements or to publicly announce the results of any revisions to any statements to reflect new information or future events or developments.

We have identified some of the important factors that could cause future events to differ from our current expectations and they are described in this prospectus and supplements to this prospectus under the caption "Risk Factors" as well as in our most recent Annual Report on Form 10-K, including without limitation under the captions "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" and in other documents that we may file with the SEC, all of which you should review carefully. Please consider our forward-looking statements in light of those risks as you read this prospectus and any prospectus supplement.

USE OF PROCEEDS

We will retain broad discretion over the use of the net proceeds from the sale of our securities offered by us hereby. Except as described in any prospectus supplement, we currently intend to use the net proceeds from the sale of securities offered by us pursuant to this prospectus for working capital, capital expenditures, investments in our subsidiaries, and other general corporate purposes. We may also use such proceeds to fund acquisitions of businesses, technologies or product lines that complement our current business. However, we currently have no commitments or agreements for any specific acquisitions. Pending application of the net proceeds, we intend to invest the net proceeds of the offering of securities by us in investment-grade, interest-bearing securities.

GENERAL DESCRIPTION OF SECURITIES

We, directly or through agents, dealers or underwriters designated from time to time, may offer, issue and sell, together or separately, in one or more offerings, up to \$15,000,000 in the aggregate, inclusive of any exercise price thereof, of:

- shares of our common stock, par value \$0.001 per share;
- warrants to purchase shares of our common stock; or
- any combination of the foregoing, either individually or as units consisting of one or more of the foregoing, each on terms to be determined at the time of sale.

The common stock and the warrants, whether issued individually or as units, are collectively referred to herein as the securities. This prospectus provides you with a general description of the securities we may offer. Each time we offer securities, we will provide you with a prospectus supplement that describes the specific amounts, prices and terms of the securities we offer. The securities involve various risks that we will describe in the section entitled "Risk Factors" that will be included in each prospectus supplement.

DESCRIPTION OF CAPITAL STOCK

The following is a summary description of the rights of our common stock and related provisions of our amended Articles of Incorporation and our Bylaws. The following description of our capital stock is intended as a summary only and is qualified in its entirety by reference to our amended Articles of Incorporation and our Bylaws, which are filed as exhibits to the registration statement of which this prospectus forms a part, and to the applicable provisions of Minnesota law.

Common Stock

Our common shares are listed on the NYSE Amex under the symbol "ISR". As of October 15, 2009, 22,942,088 shares of common stock were issued and outstanding.

The Company's Articles of Incorporation provide that the Company has the authority to issue 200 million shares of capital stock, which are currently divided into two classes as follows: 194 million shares of common stock, par value of \$0.001 per share; and 6 million shares of preferred stock, also with a par value of \$0.001 per share.

The holders of our common stock have no preemptive or other subscription rights, and there are no conversion rights or redemption or sinking fund provisions with respect to such shares. All of the outstanding shares of our common stock are, and the shares of our common stock when issued will be, fully paid and nonassessable.

Voting. Holders of the common stock are entitled to one vote per share on all matters to be voted on by the Company's shareholders. The Company's bylaws provide that a majority of the outstanding shares of the corporation entitled to vote constitute a quorum at a meeting of the shareholders.

Dividends. The Company's Board of Directors, in its sole discretion, may declare and pay dividends on the common stock, payable in cash or other consideration, out of funds legally available, if all dividends due on the preferred stock have been declared and paid. The Company has not paid any cash dividends on its common stock and does not plan to pay any cash dividends on its common stock for the foreseeable future.

Liquidation, Subdivision, or Combination. In the event of any liquidation, dissolution or winding up of the Company or upon the distribution of its assets, all assets and funds remaining after payment in full of the Company's debts and liabilities, and after the payment to holders of any then outstanding preferred stock of the full preferential amounts to which they were entitled, would be divided and distributed among holders of the common stock.

Anti-Takeover Effects Of Provisions Of The Articles Of Incorporation. The authorized but unissued shares of our common and preferred stock are available for future issuance without our shareholders' approval. These additional shares may be utilized for a variety of corporate purposes including but not limited to future public or direct offerings to raise additional capital, corporate acquisitions and employee incentive plans. The issuance of such shares may also be used to deter a potential takeover of IsoRay that may otherwise be beneficial to shareholders by diluting the shares held by a potential suitor or issuing shares to a shareholder that will vote in accordance with IsoRay's Board of Directors' desires. A takeover may be beneficial to shareholders because, among other reasons, a potential suitor may offer shareholders a premium for their shares of stock compared to the then-existing market price.

On February 1, 2007, the Board of Directors of IsoRay, Inc. declared a dividend of one preferred share purchase right (a "Right") for each outstanding Common Share of the par value of \$.001 per share (the "Common Shares") of the Company. The dividend is payable on February 16, 2007 (the "Record Date") to shareholders of record on that date.

Each Right entitles the registered holder to purchase from the Company one one-hundredth of a Series C Junior Participating Preferred Share of the par value of \$.001 per share (the "Preferred Shares") of the Company at a price of \$25 per one one-hundredth of a Preferred Share (the "Purchase Price"), subject to adjustment. The description and terms of the Rights are set forth in a Rights Agreement (the "Rights Agreement"), dated as of February 1, 2007, between the Company and Computershare Trust Company N.A., as Rights Agent (the "Rights Agent").

Initially, the Rights will attach to all certificates representing Common Shares then outstanding and no separate Right Certificates will be distributed. The Rights will separate from the Common Shares and a Distribution Date for the Rights will occur upon the earlier of:

- (i) the close of business on the fifteenth day following a public announcement that a person or group of affiliated or associated persons has become an "Acquiring Person" (i.e., has become, subject to certain exceptions, the beneficial owner of 15% or more of the voting power of the outstanding shares of voting capital stock of the Company in the election of directors), or
- (ii) the close of business on the fifteenth day following the first public announcement relating to a tender offer or exchange offer the consummation of which would result in a person or group of affiliated or associated persons becoming, subject to certain exceptions, the beneficial owner of 15% or more of the voting power of the outstanding shares of voting capital stock of the Company in the election of directors (or such later date as may be determined by the Board of Directors of the Company prior to a person or group of affiliated or associated persons becoming an Acquiring Person).

Until the Distribution Date,

- (i) the Rights will be evidenced by the Common Share certificates and will be transferred with and only with the Common Shares,
- (ii) new Common Share certificates issued after the Record Date upon transfer or new issuance of the Common Shares will contain a notation incorporating the Rights Agreement by reference, and

(iii) the surrender for transfer of any Common Share certificate, even without such notation or a copy of this Summary of Rights attached thereto, will also constitute the transfer of the Rights associated with the Common Shares represented by such certificate.

As promptly as practicable following the Distribution Date, separate certificates evidencing the Rights ("Right Certificates") will be mailed to holders of record of the Common Shares as of the close of business on the Distribution Date and such separate Right Certificates alone will evidence the Rights.

The Rights are not exercisable until the Distribution Date. The Rights will expire on February 16, 2017, unless extended or earlier redeemed or exchanged by the Company as described below.

The Purchase Price payable, and the number of Preferred Shares or other securities or property issuable, upon exercise of the Rights are subject to adjustment from time to time to prevent dilution:

- (i) in the event of a stock dividend on, or a subdivision, combination or reclassification of, the Preferred Shares,
- (ii) upon the grant to holders of the Preferred Shares of certain rights, options or warrants to subscribe for or purchase Preferred Shares or convertible securities at less than the then current market price of the Preferred Shares, or
- (iii) upon the distribution to holders of the Preferred Shares of evidences of indebtedness or assets (excluding regular periodic cash dividends or dividends payable in Preferred Shares) or of subscription rights or warrants (other than those described in clause (ii) hereof).

The number of Preferred Shares issuable upon the exercise of a Right is also subject to adjustment in the event of a dividend on Common Shares payable in Common Shares, or a subdivision, combination or consolidation of the Common Shares.

With certain exceptions, no adjustment in the Purchase Price will be required until cumulative adjustments require an adjustment of at least 1% in the Purchase Price. No fractional Preferred Shares will be issued (other than fractional shares which are integral multiples of one one-hundredth (subject to adjustment) of a Preferred Share, which may, at the election of the Company, be evidenced by depositary receipts) if in lieu thereof a payment in cash is made based on the closing price (pro-rated for the fraction) of the Preferred Shares on the last trading date prior to the date of exercise.

In the event that any person or group of affiliated or associated persons becomes an Acquiring Person, proper provision shall be made so that each holder of a Right, other than Rights that are or were beneficially owned by the Acquiring Person (which will thereafter be void), will thereafter have the right to receive upon exercise thereof at the then current exercise price of the Right that number of Common Shares having a market value of two times the exercise price of the Right, subject to certain possible adjustments.

In the event that, after the Distribution Date or within 15 days prior thereto, the Company is acquired in certain mergers or other business combination transactions or 50% or more of the assets or earning power of the Company and its subsidiaries (taken as a whole) are sold after the Distribution Date or within 15 days prior thereto, each holder of a Right (other than Rights which have become void under the terms of the Rights Agreement) will thereafter have the right to receive, upon exercise thereof at the then current exercise price of the Right, that number of common shares of the acquiring company (or, in certain cases, one of its affiliates) having a market value of two times the exercise price of the Right.

In certain events specified in the Rights Agreement, the Company is permitted to temporarily suspend the exercisability of the Rights.

At any time after a person or group of affiliated or associated persons becomes an Acquiring Person (subject to certain exceptions) and prior to the acquisition by a person or group of affiliated or associated persons of 50% or more of the voting power of the outstanding shares of voting capital stock of the Company in the election of directors, the Board of Directors of the Company may exchange all or part of the Rights (other than Rights which have become void under the terms of the Rights Agreement) for Common Shares or equivalent securities at an exchange ratio per Right equal to the result obtained by dividing the exercise price of a Right by the current per share market price of the Common Shares, subject to adjustment.

At any time prior to such time as a person or group of affiliated or associated persons becomes an Acquiring Person, the Board of Directors of the Company may redeem the Rights in whole, but not in part, at a price of \$.001 per Right, subject to adjustment (the "Redemption Price"), payable in cash. The period of time during which the Rights may be redeemed may be extended by the Board of Directors of the Company if no person has become an Acquiring Person. The redemption of the Rights may be made effective at such time, on such basis and with such conditions as the Board of Directors in its sole discretion may establish. The Board of Directors and the Company shall not have any liability to any person as a result of the redemption or exchange of the Rights pursuant to the provisions of the Rights Agreement.

The terms of the Rights may be amended by the Board of Directors of the Company, subject to certain limitations after such time as a person or group of affiliated or associated persons becomes an Acquiring Person, without the consent of the holders of the Rights, including an amendment prior to the date a person or group of affiliated or associated persons becomes an Acquiring Person to lower the 15% threshold for exercisability of the Rights to not less than the greater of (i) the sum of .001% and the largest percentage of the outstanding shares of voting capital stock of the Company with voting power in the election of directors then known by the Company to be beneficially owned by any person or group of affiliated or associated persons (subject to certain exceptions) or (ii) 10%.

Until a Right is exercised, the holder thereof, as such, will have no rights as a shareholder of the Company, including, without limitation, the right to vote or to receive dividends.

The foregoing description of the Rights Agreement is qualified in its entirety by reference to the full text of the Rights Agreement.

Transfer Agent and Registrar. The transfer agent and registrar for our common stock is Computershare Trust Company, N.A. The transfer agent's address is 350 Indiana Street, Golden, CO 80401, and its telephone number is (303) 262-0600.

DESCRIPTION OF THE WARRANTS

Terms of Prospective Warrant Issuances

We may issue warrants to purchase shares of our common stock in one or more series. The warrants may be issued independently or together with shares of our common stock and may be attached to or separate from the shares of our common stock. The warrants may be issued by us directly or under warrant agreements to be entered into between us and a bank or trust company, as warrant agent, all as shall be set forth in the prospectus supplement relating to warrants being offered pursuant to such prospectus supplement. The following description of the warrants will apply to the warrants offered by this prospectus unless we provide otherwise in the applicable prospectus supplement. The applicable prospectus supplement for a particular series of warrants may specify different or additional terms.

A copy of the form of warrant agreement, including the form of warrant certificate representing a series of warrants, will be filed with the SEC in connection with the offering of a particular 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 the particular series of warrants that we may offer under this prospectus. We urge you to read the applicable prospectus supplement(s) related to the particular series of warrants that we may offer under this prospectus, as well as any prospectus supplement, and the complete warrant agreements and warrant certificates that contain the terms of the warrants.

The applicable prospectus supplement will describe the following terms of warrants offered:

- the offering price and aggregate number of warrants offered;
- if applicable, the number of warrants issued with each share of common stock;
- if applicable, the date on and after which the warrants and the related common stock will be separately transferable;
- the number of shares of common stock 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 shares of common stock 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;
 - the anti-dilutive protections given to the holders of such warrants;
- a discussion of any material or special U.S. federal income tax consequences of holding or exercising the warrants; and
 - any other specific terms, preferences, rights or limitations of or restrictions on the warrants.

Holders of warrants will not be entitled, by virtue of being such holders, to vote, consent, receive dividends, receive notice as stockholders with respect to any meeting of stockholders for the election of our directors or any other matter, or to exercise any rights whatsoever as our stockholders.

The exercise price payable and the number of shares of our common stock purchasable upon the exercise of each warrant will be subject to adjustment in certain events, including the issuance of a stock dividend to holders of our common stock or a stock split, reverse stock split, combination, subdivision or reclassification of our common stock. In lieu of adjusting the number of shares of our common stock purchasable upon exercise of each warrant, we may elect to adjust the number of warrants. No fractional shares will be issued upon exercise of the warrants, but we will pay the cash value of any fractional shares otherwise issuable. Notwithstanding the foregoing, in case of any consolidation, merger, or sale or conveyance of our property as an entirety or substantially as an entirety, the holder of each outstanding warrant shall have the right to the kind and amount of shares of stock and other securities and property, including cash, receivable by a holder of the number of shares of our common stock into which the warrant was exercisable immediately prior to such transaction.

Each warrant will entitle the holder to purchase for cash such shares of our common stock at such exercise price as shall in each case be set forth in, or be determinable as set forth in, the prospectus supplement relating to the warrants offered thereby. Warrants may be exercised at any time up to the close of business on the expiration date set forth in

the prospectus supplement relating to the warrants offered thereby. After the close of business on the expiration date, unexercised warrants will become void.

The warrants may be exercised as set forth in the prospectus supplement relating to the warrants offered. Upon receipt of 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 prospectus supplement, we will, as soon as practicable, forward the shares of our common stock purchasable upon such exercise. If less than all of the warrants represented by such warrant certificate are exercised, a new warrant certificate will be issued for the remaining warrants.

Governing Law

Unless we provide otherwise in the applicable prospectus supplement, the warrants and warrant agreements will be governed by and construed in accordance with the laws of the State of Minnesota.

Enforceability of Rights by Holders of Warrants

Each warrant agent (if any) will act solely as our agent under the applicable warrant agreement and will not assume any obligation or relationship of agency or trust with any holder of any warrant. A single bank or trust company may act as warrant agent for more than one issue of warrants. A warrant agent will have no duty or responsibility in case of any default by us under the applicable warrant agreement or warrant, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a warrant may, without the consent of the related warrant agent or the holder of any other warrant, enforce by appropriate legal action its right to exercise, and receive the securities purchasable upon exercise of, its warrants.

DESCRIPTION OF UNITS

The following description, together with the additional information we may include in any applicable prospectus supplement, 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 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.

We may issue units comprised of one or more shares of common 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, but not limited to:

- 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" and "Description of the Warrants" will apply to each unit and to any common stock or warrant included in each unit, respectively.

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

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.

UNDERWRITING

Pursuant to General Instruction I.B.6. of Form S-3, we are permitted to use the registration statement of which this prospectus forms a part to sell, via a primary offering, a maximum amount of securities equal to one-third of the aggregate market value of our outstanding voting and non-voting common equity held by non-affiliates of our company in any twelve month period. We may, from time to time, offer and sell the securities registered hereby up to the lesser of this maximum amount or \$15,000,000.

We may sell the securities through underwriters or dealers, through agents, or directly to one or more purchasers or through a combination of these methods, or through any other method permitted by applicable law. The applicable prospectus supplement will describe the terms of the offering of the securities, including:

- the name or names of any underwriters, if any, and if required, any dealers or agents;
- the purchase price of the securities and the proceeds we will receive from the sale;
- any underwriting discounts and other items constituting underwriters' compensation;
- any discounts or concessions allowed or reallowed or paid to dealers; and
- any securities exchange or market on which the securities may be listed.

We may distribute the securities from time to time in one or more transactions at:

- a fixed price or prices, which may be changed from time to time;
- market prices prevailing at the time of sale;
- prices related to such prevailing market prices; or

- negotiated prices.

Only underwriters named in the prospectus supplement are underwriters of the securities offered by that prospectus supplement. If we utilize any underwriters in the sale of our securities in respect of which this prospectus is delivered, we will enter into an underwriting agreement with those underwriters at the time of sale to them. We will set forth the names of these underwriters and the terms of the transaction in the applicable prospectus supplement, which will be used by the underwriters to make resales of our securities in respect of which this prospectus is delivered to the public.

If we use underwriters in the sale of securities, they will acquire the securities for their own account and may resell them 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. We may offer the securities to the public through underwriting syndicates represented by managing underwriters or by underwriters without a syndicate. Any public offering price and any discounts or concessions allowed or reallocated or paid to dealers may change from time to time.

If we use a dealer in the sale of the securities being offered pursuant to this prospectus, we will sell the 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 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.

We may authorize agents or underwriters to solicit offers by 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.

In connection with the sale of the securities, underwriters, dealers or agents may receive compensation from us, or from purchasers of the securities for whom they act as agents, in the form of discounts, concessions or commissions. Underwriters may sell the securities to or through dealers, and those dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters or commissions from the purchasers for whom they may act as agents. Underwriters, dealers and agents that participate in the distribution of the securities, and any institutional investors or others that purchase securities directly and then resell the securities, may be deemed to be underwriters, and any discounts or commissions received by them from us and any profit on the resale of the securities by them may be deemed to be underwriting discounts and commissions under the Securities Act.

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

In addition, we may enter into derivative transactions with third parties (including the writing of options), or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement indicates, in connection with such a transaction, the third parties may, pursuant to this prospectus and the applicable prospectus supplement, sell securities covered by this prospectus and the applicable prospectus supplement. If so, the third party may use securities borrowed from us or others to settle such sales and may use securities received from us to close out any related short positions. We may also loan or pledge securities covered by this prospectus and the applicable prospectus supplement to third parties, who may sell the loaned securities or, in an event of default in the case of a pledge, sell the pledged securities pursuant to this prospectus and the applicable prospectus supplement. The third party in such sale transactions will be an underwriter and will be identified in the applicable prospectus supplement or in a post-effective amendment.

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.

To the extent that we make sales through one or more underwriters, dealers or agents in at-the-market offerings, we will do so pursuant to the terms of a sales agency financing agreement or other at-the-market offering arrangement between us and the underwriters or agents. If we engage in at-the-market sales pursuant to any such agreement, we will issue and sell our securities through one or more underwriters, dealers or agents, which may act on an agency basis or on a principal basis. During the term of any such agreement, we may sell securities on a daily basis in exchange transactions or otherwise as we agree with the underwriters, dealers or agents. The agreement will provide that any securities sold will be sold at prices related to the then prevailing market prices for our securities. Therefore, exact figures regarding the proceeds that will be raised or commissions to be paid cannot be determined at this time. Pursuant to the terms of the agreement, we may also agree to sell, and the relevant underwriters, dealers or agents may agree to solicit offers to purchase, blocks of our common stock or other securities. The terms of each such agreement will be set forth in more detail in the applicable prospectus supplement.

Underwriters may engage in stabilizing and syndicate covering transactions in accordance with Rule 104 under the Exchange Act. Rule 104 permits stabilizing bids to purchase the securities being offered as long as the stabilizing bids do not exceed a specified maximum. Underwriters may over-allot the offered securities in connection with the offering, thus creating a short position in their account. Syndicate covering transactions involve purchases of the offered securities by underwriters in the open market after the distribution has been completed in order to cover syndicate short positions. Underwriters may also cover an over-allotment or short position by exercising their over-allotment option, if any. Stabilizing and syndicate covering transactions may cause the price of the offered securities to be higher than it would otherwise be in the absence of these transactions. These transactions, if commenced, may be discontinued at any time.

Any underwriters who are qualified market makers on the NYSE Amex Stock Exchange may engage in passive market making transactions in the common stock on the NYSE Amex Stock Exchange in accordance with Rule 103 of Regulation M, during the business day prior to the pricing of the offering, before the commencement of offers or sales of the common stock. Passive market makers must comply with the applicable volume and price limitations and must be identified as passive market makers. In general a passive market maker must display its bid at a price not in excess of the highest independent bid for such security – if all independent bids are lowered below the passive market maker's bid, however, the passive market maker's bid must then be lowered when certain purchase limits are exceeded.

Pursuant to requirements of the Financial Industry Regulatory Authority, or FINRA, the maximum commission or discount to be received by any FINRA member or independent broker dealer may not be greater than 8.0% of the gross proceeds received by us for the sale of any securities being registered pursuant to Securities Act Rule 415.

The place and time of delivery for our securities in respect of which this prospectus is delivered will be set forth in the applicable prospectus supplement.

LEGAL MATTERS

Certain legal matters with respect to the securities being offered hereby will be passed on by Keller Rohrback, PLC, Phoenix, Arizona. If securities are distributed in an underwritten offering, certain legal matters will be passed upon for the underwriters by counsel identified in the applicable prospectus supplement.

EXPERTS

DeCoria, Maichel & Teague, P.S., independent registered public accounting firm, has audited our consolidated balance sheets as of June 30, 2009 and June 30, 2008, and related consolidated statements of operations, shareholders' equity and cash flows for the years ended June 30, 2009 and 2008, included in our Annual Report on Form 10-K for the fiscal year ended June 30, 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 DeCoria, Maichel & Teague, P.S.'s report, given on the authority of said firm as experts in accounting and auditing.

INTERESTS OF NAMED EXPERTS AND COUNSEL

None.

MATERIAL CHANGES

None.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We have filed a registration statement on Form S-3 with the SEC relating to the common stock and the warrants offered by this prospectus. This prospectus does not contain all of the information set forth in the registration statement and the exhibits and schedules thereto. We have omitted parts of the registration statement, as permitted by the rules and regulations of the SEC. Statements contained in this prospectus as to the contents of any contract or other document referred to are not necessarily complete and in each instance reference is made to the copy of such contract or other document filed as an exhibit to the registration statement, each such statement being qualified in all respects by such reference. For further information with respect to us and the common stock, and the warrants offered hereby, reference is made to such registration statement, exhibits and schedules.

We are subject to the information and periodic reporting requirements of the Exchange Act, and in accordance therewith file periodic reports, current reports, proxy statements and other information with the SEC. Such periodic reports, current reports, proxy statements, other information and a copy of this registration statement on Form S-3 may be inspected by anyone without charge and copies of these materials may be obtained upon the payment of the fees prescribed by the SEC, at the Public Reference Room maintained by the SEC at 100 F Street, N.E., Washington, D.C. 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. This registration statement on Form S-3 and the periodic reports, current reports, proxy statements and other information filed by us are also available through the Internet web site maintained by the SEC at the following address: <http://www.sec.gov>.

INCORPORATION BY REFERENCE

The SEC allows us to "incorporate by reference" into this prospectus the information we file with it. This means that we can disclose important information to you by referring you to those documents. The information we incorporate by reference is considered to be a part of this prospectus, and later information we file with the SEC will automatically update and supersede this information. The following documents filed with the SEC (in each case, under our Commission File No. 001-33407) are incorporated by reference in this prospectus:

- (a) Our Annual Report on Form 10-K for the fiscal year ended June 30, 2009 (filed September 23, 2009), which contains audited financial statements for our latest fiscal year for which such statements have been filed.
- (b) Our Current Reports on Form 8-K filed on September 24, 2009 and October 2, 2009.

(d) The description of our common stock contained in our Registration Statement on Form 8-A, filed with the Commission on April 12, 2007, including any amendments or reports filed for the purpose of updating such description.

We are also incorporating by reference any future filings we make with the SEC under Section 13(a), 13(c), 14 or 15(d) of the Exchange Act until this offering is completed, including those made between the date of filing of the initial registration statement and prior to effectiveness of the registration statement, except for information furnished under Item 2.02 or Item 7.01 of our Current Reports on Form 8-K which is not deemed to be filed and not incorporated by reference herein.

We will provide, without charge, to each person to whom a copy of this prospectus has been delivered, upon written or oral request of such person, a copy of any or all of the documents incorporated by reference herein (other than certain exhibits to such documents not specifically incorporated by reference). Requests for such copies should be directed to: IsoRay, Inc., 350 Hills Street, Suite 106, Richland, Washington 99354, telephone number (509) 375-1202, Attention: Lori Woods, Chief Operating Officer.

COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITIES

The Company's Articles of Incorporation provide to directors and officers indemnification to the full extent provided by law, and provide that, to the extent permitted by Minnesota law, a director will not be personally liable for monetary damages to the Company or its shareholders for breach of his or her fiduciary duty as a director, except for liability for certain actions that may not be limited under Minnesota law. On July 1, 2006, the Company entered into Indemnification Agreements with each of its directors and executive officers, and the Company intends to enter into substantially identical agreements with any officers and directors who take office in the future. The purpose of the Indemnification Agreements is to provide all officers and directors with indemnification to the fullest extent permitted under the Minnesota Business Corporations Act.

Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons pursuant to the foregoing provisions, or otherwise, in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable.