

TRANSGENOMIC INC
Form 424B3
March 29, 2013

**PROSPECTUS Filed Pursuant to Rule 424(b)(3)
Registration No. 333-187285**

24,900,000 SHARES OF COMMON STOCK

TRANSGENOMIC, INC.

This prospectus relates to the resale by the investors listed in the section titled “Selling Stockholders”, and we refer to the investors as the selling stockholders (the “Selling Stockholders”) of up to 24,900,000 shares of our Common Stock, par value \$0.01 per share (the “Common Stock” or “Common Shares”). The Common Shares offered consist of: (i) up to 16,600,000 Common Shares and (ii) up to 8,300,000 Common Shares issuable upon exercise of outstanding warrants (the “Warrants”). We issued the Common Shares and Warrants in connection with a private placement offering in January 2013. We are registering the resale of the Common Shares and the Common Shares underlying the Warrants as required by the Registration Rights Agreement we entered into with the Selling Stockholders on January 24, 2013 (the “Registration Rights Agreement”).

Our registration of the Common Shares covered by this prospectus does not mean that the Selling Stockholders will offer or sell any of the shares. The Selling Stockholders may offer and sell or otherwise dispose of our Common Shares described in this prospectus from time to time through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices. See “Plan of Distribution” beginning on page 9 for more information.

We will not receive any of the proceeds from the Common Stock sold by the Selling Stockholders, other than any proceeds from the cash exercise of Warrants to purchase shares of our Common Stock.

No underwriter or other person has been engaged to facilitate the sale of shares of Common Stock in this offering. The Selling Stockholders may be deemed underwriters of the Common Shares that they are offering. We have agreed to pay certain expenses in connection with this registration statement and to indemnify the Selling Stockholders against certain liabilities. The Selling Stockholders will pay all underwriting discounts and selling commissions, if any, in connection with the sale of the shares of Common Stock.

You should read this prospectus carefully before you invest.

Our Common Stock is traded on the OTC Bulletin Board under the symbol "TBIO." On March 26, 2013, the last reported sale price of our Common Stock was \$0.40 per share.

Investing in our securities involves a high degree of risk. See the section entitled "Risk Factors" beginning on page 8 of this prospectus.

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

The date of this prospectus is March 29, 2013

TRANSGENOMIC, INC.

Index to Prospectus

About this Prospectus	K
A Warning about Forward-Looking Statements	K
Prospectus Summary	L
The Offering	M
Risk Factors	M
Use of Proceeds	I1
Determination of Offering Price	I1
Plan of Distribution	I1
Selling Stockholders	I3
Description of Common Stock	I7
Legal Matters	J0
Experts	21
Where You Can Find Additional Information	J1
Incorporation of Certain Information by Reference	J1

ABOUT THIS PROSPECTUS

You should rely only on the information contained or incorporated by reference in this prospectus. Neither we nor the Selling Stockholders have authorized anyone to provide you with information that is different from such information. If anyone provides you with different or inconsistent information, you should not rely on it. The Selling Stockholders are offering to sell Common Stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of the date on its cover page regardless of the time of delivery of this prospectus or any sale of the Common Stock. In case there are differences or inconsistencies between this prospectus and the information incorporated by reference, you should rely on the information in the document with the latest date.

The Selling Stockholders are offering the Common Stock only in jurisdictions where such issuances are permitted. The distribution of this prospectus and the issuance of the Common Stock in certain jurisdictions may be restricted by law. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the issuance of the Common Stock and the distribution of this prospectus outside the United States. This prospectus does not constitute, and may not be used in connection with, an offer to sell, or a solicitation of an offer to buy, the Common Stock offered by this prospectus by any person in any jurisdiction in which it is unlawful for such person to make such an offer or solicitation.

It is important for you to read and consider all of the information contained in this prospectus in making your investment decision. To understand the offering fully and for a more complete description of the offering you should read this entire document carefully, including particularly the “Risk Factors” section beginning on page 8. You also should read and consider the information in the documents to which we have referred you in the sections entitled “Where You Can Find Additional Information” and “Incorporation of Certain Information by Reference”.

As used in this prospectus, unless the context requires otherwise, the terms “we”, “us”, “our”, or “the Company” refer to Transgenomic, Inc. and its subsidiaries on a consolidated basis. References to “Selling Stockholders” refer to those stockholders listed herein under “Selling Stockholders” and their successors, assignees and permitted transferees.

A WARNING ABOUT FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference in this prospectus may contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), about the Company and its subsidiaries. These forward-looking statements are intended to be covered by the safe harbor for forward-looking statements provided by the Private Securities Litigation Reform Act of 1995. Forward-looking statements are not

statements of historical fact, and can be identified by the use of forward-looking terminology such as “believes”, “expects”, “may”, “will”, “could”, “should”, “projects”, “plans”, “goal”, “targets”, “potential”, “estimates”, “pro forma”, “seek”, “anticipates” or the negative thereof or comparable terminology. Forward-looking statements include discussions of strategy, financial projections, guidance and estimates (including their underlying assumptions), statements regarding plans, objectives, expectations or consequences of various transactions, and statements about the future performance, operations, products and services of the Company and its subsidiaries. We caution our stockholders and other readers not to place undue reliance on such statements.

You should read this prospectus and the documents incorporated by reference completely and with the understanding that our actual future results may be materially different from what we currently expect. Our business and operations are and will be subject to a variety of risks, uncertainties and other factors. Consequently, actual results and experience may materially differ from those contained in any forward-looking statements. Such risks, uncertainties and other factors that could cause actual results and experience to differ from those projected include, but are not limited to, the risk factors set forth in the section entitled “Risk Factors” beginning on page 8 of this prospectus and elsewhere in the documents incorporated by reference in this prospectus, including our Annual Report on Form 10-K for the year ended December 31, 2012.

You should assume that the information appearing in this prospectus, any accompanying prospectus supplement and any document incorporated herein by reference is accurate as of its date only. Further, any forward looking statement speaks only as of the date on which it is made. New factors emerge from time to time, and it is not possible for us to predict which factors will arise. In addition, we cannot assess the impact of each factor on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward looking statements. All written or oral forward-looking statements attributable to us or any person acting on our behalf made after the date of this prospectus are expressly qualified in their entirety by the risk factors and cautionary statements contained in and incorporated by reference into this prospectus. Unless legally required, we do not undertake any obligation to release publicly any revisions to such forward-looking statements to reflect events or circumstances after the date of this prospectus or to reflect the occurrence of unanticipated events.

The Offering

PROSPECTUS SUMMARY

The following summary highlights selected information contained elsewhere in this prospectus and in the documents incorporated by reference in this prospectus and does not contain all the information you will need in making your investment decision. You should read carefully this entire prospectus and the documents incorporated by reference in this prospectus before making an investment decision. This prospectus provides you with a general description of Transgenomic, the Common Stock issuable under this prospectus and the offering.

Business

Transgenomic, Inc. ("we", "us", "our Company" or "Transgenomic") is a global biotechnology company advancing personalized medicine in the detection and treatment of cancer and inherited diseases through its proprietary molecular technologies and world-class clinical and research services. Our operations are organized and reviewed by management along its product lines and presented in the following three complementary business segments.

Clinical Laboratories. Our clinical laboratories specialize in genetic testing for cardiology, neurology, mitochondrial disorders, and oncology. Located in New Haven, Connecticut and Omaha, Nebraska the molecular clinical reference laboratories are certified under the Clinical Laboratory Improvement Amendment (CLIA) as high complexity labs and our Omaha facility is also accredited by the College of American Pathologists (CAP).

Pharmacogenomics Services. Our Contract Research Organization located in Omaha, Nebraska provides pharmacogenomics research services supporting Phase II and Phase III clinical trials conducted by our pharmaceutical customers. This lab specializes in pharmacogenomic, biomarker and mutation discovery research serving the pharmaceutical and biomedical industries world-wide for disease research, drug and diagnostic development and clinical trial support.

Diagnostic Tools. Our proprietary product is the WAVE® System which has broad applicability to genetic variation detection in both molecular genetic research and molecular diagnostics. We also distribute bioinstruments produced by other manufacturers ("OEM Equipment") through our sales and distribution network. Service contracts to maintain installed systems are sold and supported by our technical support personnel. The installed WAVE base and some OEM Equipment platforms generate a demand for consumables that are required for the continued operation of the bioinstruments. We develop, manufacture and sell these consumable products. In addition, we manufacture and sell consumable products that can be used on multiple, independent platforms. These products include SURVEYOR® Nuclease and a range of chromatography columns.

For a complete description of our business, financial condition, results of operations and other important information, we refer you to our filings with the Securities and Exchange Commission (the “SEC”) that are incorporated by reference in this prospectus, including our Annual Report on Form 10-K for the year ended December 31, 2012. For instructions on how to find copies of these documents, see “Where You Can Find Additional Information”.

We were incorporated in Delaware on March 6, 1997. Our principal office is located at 12325 Emmet Street, Omaha, Nebraska 68164 and our telephone phone number is 402-452-5400. Our website address is www.transgenomic.com. Information on our website, or that can be accessed through our website, is not incorporated by reference into this prospectus and does not constitute part of this prospectus.

The Offering

Issuer	Transgenomic, Inc.
Common Stock outstanding	88,245,725 Common Shares ⁽¹⁾
Common Stock, offered by the Selling Stockholders	24,900,000 Common Shares ⁽²⁾
Common Stock outstanding after the offering	96,545,725 Common Shares ⁽³⁾

Use of proceeds We will not receive any proceeds from the sale of the Common Shares. We may, however, receive cash proceeds upon the cash exercise of Warrants, and we intend to use any such proceeds for general corporate and working capital purposes. See "Use of Proceeds" beginning on page 9 of this prospectus.

Listing Our Common Stock is listed on the OTC Bulletin Board under the symbol "TBIO".

Risk Factors You should consider carefully the matters set forth under "Risk Factors" beginning on page 8 of this prospectus before deciding to purchase any of the Common Stock.

The number of shares shown to be outstanding is based on the number of shares of our Common Stock outstanding as of March 7, 2013, and does not include shares issuable upon exercise of outstanding warrants (including the (1) shares of Common Stock underlying the Warrants registered hereunder), shares of Common Stock issuable upon conversion of the outstanding shares of our Series A Convertible Preferred Stock or shares issuable upon exercise of outstanding options to acquire Common Stock.

(2) The number of shares shown to be registered hereunder includes 16,600,000 shares of Common Stock outstanding and 8,300,000 shares of Common Stock issuable upon exercise of Warrants.

The number of shares outstanding after the offering assumes full cash exercise by the Selling Stockholders of the 8,300,000 shares of Common Stock issuable upon exercise of Warrants being registered hereunder and includes the (3) Common Shares issuable upon exercise of the Warrants, but excludes shares issuable upon exercise of other outstanding warrants, shares of Common Stock issuable upon conversion of the outstanding shares of our Series A Convertible Preferred Stock and shares issuable upon exercise of outstanding options to acquire Common Stock.

RISK FACTORS

Ownership of our Common Stock involves certain risks. You should consider carefully the risks and uncertainties described in, or incorporated by reference in, this prospectus, including the risks described below, along with the other information included or incorporated by reference in this prospectus, in evaluating an investment in the Common Stock.

The risks and uncertainties described in this prospectus are not the only ones facing us. Additional risks and uncertainties that we do not presently know about or that we currently believe are not material may also adversely affect our business. If any of the risks and uncertainties described in this prospectus or the documents incorporated by reference herein actually occur, our business, financial condition and results of operations could be adversely affected in a material way. This could cause the trading price of our Common Stock to decline, perhaps significantly, and you may lose part or all of your investment.

Our Common Stock is equity and therefore is subordinate to our indebtedness and preferred stock.

Our Common Stock is an equity interest and does not constitute indebtedness of the Company. Consequently, our Common Stock ranks junior to all current and future indebtedness of the Company and other non-equity claims against us with respect to assets available to satisfy claims against us, including in the event of our liquidation or dissolution. We may, and our other subsidiaries may also, incur additional indebtedness from time to time and may increase our aggregate level of outstanding indebtedness.

Further, holders of our Common Stock are subject to the prior dividend and liquidation rights of any holders of our preferred stock that may be outstanding from time to time. Our Board of Directors has designated 3,879,307 shares of our authorized preferred stock as Series A Convertible Preferred Stock (the “Series A Preferred”) with certain rights, privileges and preferences which are senior to the rights of the holders of our Common Stock. Our Board of Directors is authorized to cause us to issue additional classes or series of preferred stock without any action on the part of our common stockholders. If we issue additional shares of Series A Preferred or other preferred shares in the future that have a preference over our Common Stock with respect to the payment of dividends or upon liquidation, or if we issue preferred shares with voting rights that dilute the voting power of our Common Stock, then the rights of holders of our Common Stock or the market price of our Common Stock could be adversely affected.

Sales of our shares issued in our recent private placement may cause the market price of our shares to decline.

On January 30, 2013, we issued 16,600,000 shares of Common Stock and Warrants to purchase an additional 8,300,000 shares of Common Stock to investors. Pursuant to the Registration Rights Agreement, we are registering with the SEC 24,900,000 of those shares and warrant shares for resale as described in this prospectus. The shares issued on January 30, 2013 represent approximately 26% of our issued and outstanding shares of Common Stock, assuming full cash exercises of the Warrants. Upon effectiveness of this registration statement of which this prospectus is a part, these shares may be freely sold in the open market. The sale of a significant amount of shares in the open market, or the perception that these sales may occur, could cause the trading price of our Common Stock to decline or become highly volatile.

Our ability to use our net operating losses to offset future taxable income will be subject to certain limitations.

In general, under Section 382 of the Internal Revenue Code of 1986, as amended, or the Internal Revenue Code, a corporation that undergoes an “ownership change” is subject to limitations on its ability to utilize its pre-ownership change net operating losses, or NOLs, to offset future taxable income. Our existing NOLs will be subject to limitations arising from previous ownership changes, and if we undergo an ownership change in the future, our ability to utilize NOLs could be further limited by Section 382 of the Internal Revenue Code. Furthermore, our ability to utilize NOLs of any companies that we may acquire in the future may be subject to limitations. As a result, if we earn net taxable income, our ability to use our pre-change net operating loss carryforwards to offset U.S. federal taxable income will be subject to limitations, which could potentially result in increased future tax liability to us. The purchase of our Common Stock pursuant to this offering or acquisition of our Common Stock upon Warrant exercise could potentially cause, or increase the risk of, an ownership change that triggers the Section 382 limitation upon the utilization of our NOLs.

We have a history of operating losses and may incur losses in the future.

We have experienced annual losses from continuing operations since inception of our operations. Our operating loss for the years ended December 31, 2012, 2011 and 2010 were \$9.5 million, \$3.0 million and \$3.6 million, respectively. These historical losses have been due principally to the expenses that we have incurred in order to develop and market our products, the fixed nature of our manufacturing costs, restructuring charges, impairment charges and merger and acquisition costs.

We might enter into new acquisitions that are difficult to integrate, disrupt our business, dilute stockholder value or divert management attention.

Our success will depend in part on our ability to continually enhance and broaden our product offerings in response to changing technologies, customer demands and competitive pressures. We expect to seek to acquire businesses, technologies or products that will complement or expand our existing business, including acquisitions that could be material in size and scope. Any acquisition we might make in the future might not provide us with the benefits we anticipated upon entering into the transaction. Any future acquisitions involve various risks, including:

- Difficulties in integrating the operations, technologies, products and personnel of the acquired entities;
 - The risk of diverting management's attention from normal daily operations of the business;
 - Potential difficulties in completing projects associated with in-process research and development;
- Risks of entering markets in which we have no or limited direct prior experience and where competitors in such markets have stronger market positions;
 - Initial dependence on unfamiliar supply chains or relatively small supply partners;
 - Unexpected expenses resulting from the acquisition;
 - Potential unknown liabilities associated with acquired businesses;

- Insufficient revenues to offset increased expenses associated with the acquisition; and
- The potential loss of key employees of the acquired entities.

An acquisition could result in the incurrence of debt, restructuring charges or large one-time write-offs. Acquisitions also could result in goodwill and other intangible assets that are subject to impairment tests, which might result in future impairment charges. Furthermore, if we finance acquisitions by issuing convertible debt or equity securities, our existing stockholders may be diluted.

From time to time, we might enter into negotiations for acquisitions that are not ultimately consummated. Those negotiations could result in diversion of management time and potentially significant out-of-pocket costs. If we fail to evaluate and execute acquisitions accurately, we could fail to achieve our anticipated level of growth and our business and operating results could be adversely affected.

Our future capital needs are uncertain and we may need to raise additional funds in the future.

Our future capital needs are uncertain and we may need to raise additional funds in the future through debt or equity offerings. Our future capital requirements will depend on many factors, including, but not limited to:

- revenue generated by sales of our products;
- expenses incurred in manufacturing and selling our products;
- costs of developing new products or technologies;
- costs associated with capital expenditures;
- the number and timing of acquisitions and other strategic transactions; or
- working capital requirements related to growing new acquisitions or existing business.

Continued weakness in U.S. or global economic conditions could have an adverse effect on our businesses.

The economies of the United States and other regions of the world in which we do business have experienced significant weakness, which, in the case of the U.S., has resulted in significant unemployment and slower growth in economic activity. A continued decline in economic conditions may adversely affect demand for our services and products, thus reducing our revenue. These conditions could also impair the ability of those with whom we do business to satisfy their obligations to us.

Sales have been variable.

Testing volumes in our Clinical Laboratory are dependent on patient visits to doctors' offices and other providers of health care and tends to fluctuate on a seasonal basis. Testing volume generally declines during the year-end holiday periods, other major holidays and the summer.

Our Pharmacogenomics Services depends on project-based work that changes from quarter to quarter. Therefore, comparison of the results of successive quarters may not accurately reflect trends or results for the full year.

Changes in payer mix could have a material adverse impact on our net sales and profitability.

Testing services are billed to physicians, patients, Medicare, Medicaid and insurance companies. Tests may be billed to different payers depending on a particular patient's medical insurance coverage. Increases in the percentage of services billed to government payors could have an adverse impact on our net sales.

We may experience temporary disruptions and delays in processing tissue samples at our facilities.

We may experience delays in processing biological samples caused by software and other errors. In early 2012, our laboratory information management system (LIMS) installed in our New Haven, Connecticut laboratory testing facility experienced a software failure that resulted in reduced sample processing capacity. Although we have reviewed and improved our internal procedures to secure proper function of the LIMS and we believe that the full sample processing capacity has been restored, there are no assurances that we will not experience future temporary delays or disruptions in processing samples at our New Haven, Connecticut facility or at our other facilities. Any delay in processing samples could have an adverse effect on our business, financial condition and results of operations.

Governmental payers and health care plans have taken steps to control costs.

Medicare, Medicaid and private insurers have increased their efforts to control the costs of health care services, including clinical testing services. They may reduce fee schedules or limit/exclude coverage for types of tests that we perform. Medicaid reimbursement varies by state and is subject to administrative and billing requirements and budget pressures. We expect efforts to reduce reimbursements, impose more stringent cost controls and reduce utilization of testing services will continue. These efforts, including changes in law or regulations, may have a material adverse impact on our business.

Our Laboratory requires ongoing CLIA certification.

CLIA extended federal oversight to virtually all clinical laboratories by requiring that they be certified by the federal government or by a federally approved accreditation agency. CLIA requires that all clinical laboratories meet quality assurance, quality control and personnel standards. Laboratories must also undergo proficiency testing and are subject to inspections.

The sanctions for failure to comply with CLIA requirements include suspension, revocation or limitation of a laboratory's CLIA certificate, which is necessary to conduct business, cancellation or suspension of the laboratory's approval to receive Medicare and/or Medicaid reimbursement, as well as significant fines and/or criminal penalties. The loss or suspension of a CLIA certification, imposition of a fine or other penalties, or future changes in the CLIA law or regulations (or interpretation of the law or regulations) could have a material adverse effect on us.

We believe that we are in compliance with all applicable laboratory requirements, but no assurances can be given that our laboratories will pass all future certification inspections.

Failure to comply with HIPAA could be costly.

The Health Insurance Portability and Accountability Act (HIPAA) and associated regulations protect the privacy and security of certain patient health information and establish standards for electronic health care transactions in the United States. These privacy regulations establish federal standards regarding the uses and disclosures of protected health information. Our Molecular Labs are subject to HIPAA and its associated regulations. If we fail to comply with these laws and regulations we could suffer civil and criminal penalties, fines, exclusion from participation in governmental health care programs and the loss of various licenses, certificates and authorizations necessary to operate our Laboratory Services business. We could also incur liabilities from third party claims.

Our business could be adversely impacted by health care reform.

Government attention to the health care industry in the United States is significant and may increase. The Patient Protection and Affordable Care Act passed by Congress and signed into law by the President in March 2010 could adversely impact our business. While the ultimate impact of the legislation on the health care industry is unknown, it is likely to be extensive and could result in significant change.

We may be subject to client lawsuits.

Providers of clinical testing services may be subject to lawsuits alleging negligence or other legal claims. Potential suits could involve claims for substantial damages. Litigation could also have an adverse impact on our client base and reputation. We maintain liability insurance coverage for certain claims that could result from providing or failing to provide clinical testing services, including inaccurate testing results and other exposures. Our insurance coverage limits our maximum recovery on individual claims and, therefore, there is no assurance that such coverage will be adequate.

Market demand is outside of our control.

There are many factors that affect the market demand for our products and services that we cannot control. Demand for our WAVE System is affected by the needs and budgetary resources of research institutions, universities, hospitals and others who use the WAVE System for genetic-variation research. The WAVE System represents a significant expenditure by these types of customers and often requires a long sales cycle. Similarly, the sales cycle for the OEM Equipment that we sell can be lengthy.

The sale of our products and business operations in international markets subjects us to additional risks.

During the past several years, international sales have represented a significant portion of our total net sales. As a result, a major portion of our net sales are subject to risks associated with international sales and operations. These risks include:

- payment cycles in foreign markets are typically longer than in the U.S., and capital spending budgets for research agencies can vary over time with foreign governments;
- changes in foreign currency exchange rates can make our products more costly in local currencies since our foreign sales are typically paid for in British Pounds or the Euro;

the potential for changes in U.S. and foreign laws or regulations that result in additional import or export restrictions, higher tariffs or other taxes, more burdensome licensing requirements or similar impediments to our ability to sell products and services profitably in these markets; and
• the fluctuation of foreign currency to the US Dollar and the Euro to the British Pound can cause our net sales and expenses to increase or decrease, which adds risk to our financial statements.

Our WAVE System includes hardware components and instrumentation manufactured by a single supplier and if we are no longer able to obtain these components and instrumentation our ability to manufacture our products could be impaired.

We rely on a single supplier, Hitachi High Technologies America, to provide the basic instrument modules used in our WAVE Systems. While other suppliers of instrumentation are available, we believe that our arrangement with Hitachi offers strategic advantages. We have successfully converted the latest model of WAVE Systems to utilize Hitachi's newest instrument line. If we were required to seek alternative sources of supply, it could be time consuming and may require significant and costly modification of our WAVE System. Also, if we were unable to obtain instruments from Hitachi in sufficient quantities or in a timely manner, our ability to manufacture our products could be impaired, which could limit our future net sales.

The current economy may cause suppliers of products to not be able to perform.

We rely on various suppliers for products and materials needed to produce our products. In the event that they would be unable to deliver those items due to product shortage or business closure, we may be unable to deliver our products to our customers timely or may need to increase our prices. The current economy poses additional risk of our suppliers' ability to continue their businesses as usual.

Our markets are very competitive.

Many of our competitors have greater resources than we do and may enjoy other competitive advantages. This may allow them to more effectively market their products to our customers or potential customers, to develop products that make our products obsolete or to produce and sell products less expensively than us. As a result of these competitive factors, demand for and pricing of our products and services could be negatively affected.

Our patents may not protect us from others using our technology which could harm our business and competitive position.

Patent law relating to the scope of claims in the technology fields in which we operate is still evolving. The degree of future protection for our proprietary rights is uncertain. Furthermore, we cannot be certain that others will not independently develop similar or alternative products or technology, duplicate any of our products, or, if patents are issued to us, design around the patented products developed by us. Our patents or licenses could be challenged by litigation and, if the outcome of such litigation were adverse to us, our competitors could be free to use our technology. We may not be able to obtain additional patents for our technology, or if we are able to do so, patents may not provide us with adequate protection or be commercially beneficial. In addition, we could incur substantial costs in litigation if we are required to defend ourselves in patent suits brought by third parties or if we initiate such suits.

We cannot be certain that other measures taken to protect our intellectual property will be effective.

We rely upon trade secrets, copyright and trademark laws, non-disclosure agreements and other contractual provisions for some of our confidential and proprietary information that is not subject matter for which patent protection is being sought. Such measures, however, may not provide adequate protection for our trade secrets or other proprietary information. If such measures do not protect our rights, third parties could use our technology and our ability to compete in the market would be reduced.

We are dependent upon licensed technologies and may need to obtain additional licenses in the future to offer our products and remain competitive.

We have licensed key components of our technologies from third parties. If these agreements were to terminate prematurely due to our breach of the terms of these licenses or we otherwise fail to maintain our rights to such technology, we may lose the right to manufacture or sell a substantial portion of our products. In addition, we may need to obtain licenses to additional technologies in the future in order to keep our products competitive. If we fail to license or otherwise acquire necessary technologies, we may not be able to develop new products that we need to remain competitive.

The protection of intellectual property in foreign countries is uncertain.

A significant percentage of our sales are to customers located outside the U.S. Patent and other intellectual property laws of some foreign countries may not protect our intellectual property rights to the same extent as U.S. laws. We may need to bring proceedings to defend our patent rights or to determine the validity of our competitors' foreign patents. These proceedings could result in substantial cost and diversion of our efforts. Finally, some of our patent protection in the U.S. is not available to us in foreign countries due to the laws of those countries.

Our products could infringe on the intellectual property rights of others.

There are a significant number of U.S. and foreign patents and patent applications submitted for technologies in, or related to, our area of business. As a result, any application or exploitation of our technology by us could infringe patents or proprietary rights of others and any licenses that we might need as a result of such infringement might not be available to us on commercially reasonable terms, if at all. This may lead others to assert patent infringement or other intellectual property claims against us.

Our failure to comply with any applicable government regulations or otherwise respond to claims relating to improper handling, storage or disposal of hazardous chemicals that we use may adversely affect our results of operations.

Our research and development and manufacturing activities involve the controlled use of hazardous materials and chemicals. We are subject to federal, state, local and international laws and regulations governing the use, storage, handling and disposal of hazardous materials and waste products. If we fail to comply with applicable laws or regulations, we could be required to pay penalties or be held liable for any damages that result and this liability could exceed our financial resources. We cannot assure you that accidental contamination or injury will not occur. Any such accident could damage our research and manufacturing facilities and operations, resulting in delays and increased costs.

Our common stock is deemed to be "penny stock" which may make it more difficult for investors to sell their shares due to suitability requirements.

Our common stock is classified as a "penny stock" under the rules of the SEC. The SEC has adopted Rule 3a51-1 that establishes the definition of a "penny stock" for the purposes relevant to us, as any equity security that has a market price of less than \$5.00 per share or with an exercise price of less than \$5.00 per share, subject to certain exceptions.

For any transaction involving a penny stock, unless exempt, Rule 15g-9 requires that:

- a broker or dealer approve a person's account for transactions in penny stocks; and the broker or dealer receives from the investor a written agreement to the transaction, setting forth the identity and quantity of the penny stock to be purchased.

In order to approve a person's account for transactions in penny stocks, the broker or dealer must:

- obtain financial information and investment experience objectives of the person; and make a reasonable determination that the transactions in penny stocks are suitable for that person and the person has sufficient knowledge and experience in financial matters to be capable of evaluating the risks of transactions in penny stocks.

The broker or dealer must also deliver, prior to any transaction in a penny stock, a disclosure schedule prescribed by the SEC relating to the penny stock market, which is in highlight form:

- sets forth the basis on which the broker or dealer made the suitability determination; and
- that the broker or dealer received a signed, written agreement from the investor prior to the transaction.

Generally, brokers may be less willing to execute transactions in securities subject to "penny stock" rules. This may make it more difficult for investors to dispose of our common stock and cause a decline in the market value of our stock.

Disclosure also has to be made about the risks of investing in penny stocks in both public offerings and in secondary trading and about the commissions payable to both the broker-dealer and the registered representative, current quotations for the securities and the rights and remedies available to an investor in cases of fraud in penny stock transactions. Finally, monthly statements have to be sent disclosing recent price information for the penny stock held in the account and information on the limited market in penny stocks.

We may issue a substantial amount of our common stock to holders of options and warrants and this could reduce the market price for our stock.

At December 31, 2012, we had obligations to issue 29,660,038 shares of common stock upon exercise of outstanding stock options, warrants or conversion rights. In January 2013, we completed a private placement, pursuant to which we issued warrants to purchase up to an aggregate of 8,300,000 shares of common stock and shares of our common stock. The issuance of these additional shares of common stock may be dilutive to our current shareholders and could negatively impact the market price of our common stock.

Our common stock is thinly traded and a large percentage of our shares are held by a small group of unrelated, institutional owners.

At December 31, 2012, we had 71,645,725 shares of common stock outstanding. The sale of a significant number of shares into the public market has the potential to cause significant downward pressure on the price of our common stock. This is particularly the case if the shares being placed into the market exceed the market's ability to absorb the stock. This presents an opportunity for short sellers to contribute to the further decline of our stock price. If there are significant short sales of our stock, the price decline that would result from this activity will cause the share price to decline more so, which, in turn, may cause long holders of the stock to sell their shares thereby contributing to sales of stock in the market.

USE OF PROCEEDS

We will receive no proceeds from the sale of the Common Shares by the Selling Stockholders. We may, however, receive cash proceeds equal to the total exercise price of any Warrants to the extent that the Warrants are exercised for cash. The exercise price of the Warrants held by the Selling Stockholders is \$0.75 per share of our Common Stock. The exercise price and the number of Common Shares issuable upon exercise of the Warrants may be adjusted in certain circumstances, including stock splits, dividends, distributions or reclassifications, and mergers, consolidations, statutory share exchanges, or other similar transactions. However, these Warrants contain a "cashless exercise" feature that allows the holders, under certain circumstances, to exercise the Warrants without making a cash payment to us. There can be no assurance any of these Warrants will be exercised by the Selling Stockholders at all or that these Warrants will be exercised for cash rather than pursuant to the "cashless exercise" feature. To the extent we receive proceeds from the cash exercise of the Warrants, we intend to use such proceeds to provide capital support or for general corporate purposes, which may include, without limitation, supporting asset growth and engaging in acquisitions or other business combinations. We do not have any specific plans for acquisitions or other business combinations at this time. Our management will retain broad discretion in the allocation of the net proceeds from the exercise of the Warrants.

Pursuant to the Registration Rights Agreement, we have agreed to pay all expenses related to the registration of the shares of Common Stock.

DETERMINATION OF OFFERING PRICE

The Selling Stockholders will determine at what price they may sell the offered shares, and such sales may be made at prevailing market prices, or at privately negotiated prices.

PLAN OF DISTRIBUTION

We are registering the shares of our Common Stock previously issued to the Selling Stockholders and issuable upon exercise of the Warrants previously issued to the Selling Stockholders to permit the resale of these shares of Common Stock by the holders of the Common Stock and Warrants from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the Selling Stockholders of the shares of Common Stock. We will bear all fees and expenses incident to our obligation to register the shares of Common Stock.

The Selling Stockholders, or their pledgees, donees, transferees, or any of their successors in interest selling shares received from a Selling Stockholder as a gift, partnership distribution or other non-sale related transfer after the date of this prospectus, may sell all or a portion of the shares of Common Stock beneficially owned by them and offered hereby from time to time directly or through one or more underwriters, broker-dealers or agents. If the shares of Common Stock are sold through underwriters or broker-dealers, the Selling Stockholders will be responsible for underwriting discounts or commissions or agent's commissions. The shares of Common Stock may be sold in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices. The Selling Stockholders will act independently of us in making decisions with respect to the timing, manner and size of each sale. These sales may be effected in transactions, which may involve crosses or block transactions,

on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;

- in the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- through the writing of options, whether such options are listed on an options exchange or otherwise;
- in ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- in block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- through purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
 - in an exchange distribution in accordance with the rules of the applicable exchange;
 - in privately negotiated transactions;
 - in short sales;
- through the distribution of the Common Stock by any Selling Stockholders to its partners, members or stockholders;
 - through one or more underwritten offerings on a firm commitment or best efforts basis;
 - in sales pursuant to Rule 144;
- whereby broker-dealers may agree with the Selling Stockholders to sell a specified number of such shares at a stipulated price per share;
 - in a combination of any such methods of sale; and
 - in any other method permitted pursuant to applicable law.

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

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

To the extent any Selling Stockholder identified under "Selling Stockholders" is, or is affiliated with, a broker-dealer, it could be deemed to be, under SEC Staff interpretations, an "underwriter" within the meaning of the Securities Act. The

Selling Stockholders and any broker-dealer participating in the distribution of the shares of Common Stock may be deemed to be “underwriters” within the meaning of the Securities Act, and any commission paid, or any discounts or concessions allowed to, any such broker-dealer may be deemed to be underwriting commissions or discounts under the Securities Act. At the time a particular offering of the shares of Common Stock is made, a prospectus supplement, if required, will be distributed which will set forth the aggregate amount of shares of Common Stock being offered and the terms of the offering, including the name or names of any broker-dealers or agents, any discounts, commissions and other terms constituting compensation from the Selling Stockholders and any discounts, commissions or concessions allowed or reallocated or paid to broker-dealers. The Selling Stockholders may indemnify any broker-dealer that participates in transactions involving the sale of the shares of Common Stock against certain liabilities, including liabilities arising under the Securities Act.

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

There can be no assurance that any Selling Stockholder will sell any or all of the shares of Common Stock registered pursuant to the registration statement, of which this prospectus forms a part.

The Selling Stockholders and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including, without limitation, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the shares of Common Stock by the Selling Stockholders and any other participating person. Regulation M may also restrict the ability of any person engaged in the distribution of the shares of Common Stock to engage in market-making activities with respect to the shares of Common Stock. All of the foregoing may affect the marketability of the shares of Common Stock and the ability of any person or entity to engage in market-making activities with respect to the shares of Common Stock. The Selling Stockholders have acknowledged to us that they understand their obligations to comply, and have agreed that they will comply, with the provisions of the Exchange Act and the rules and regulations thereunder, particularly Regulation M in connection with any offering of the shares of Common Stock registered pursuant to the registration statement, of which this prospectus forms a part.

We will pay all expenses of the registration of the shares of Common Stock pursuant to the Registration Rights Agreement, estimated to be \$54,164 in total, including, without limitation, SEC filing fees and expenses of compliance with state securities or “Blue Sky” laws; *provided, however*, that a Selling Stockholder will pay all underwriting discounts and selling commissions, if any. We will indemnify the Selling Stockholders against liabilities, including some liabilities under the Securities Act, in accordance with the Registration Rights Agreement, or the Selling Stockholders will be entitled to contribution. We may be indemnified by the Selling Stockholders against civil liabilities, including liabilities under the Securities Act, that may arise from any written information furnished to us by the Selling Stockholder specifically for use in this prospectus, in accordance with the Registration Rights Agreement, or we may be entitled to contribution.

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

SELLING STOCKHOLDERS

We have prepared this prospectus to allow the Selling Stockholders or their successors, assignees or other permitted transferees to sell or otherwise dispose of, from time to time, up to 24,900,000 shares of our Common Stock. The 24,900,000 shares includes the following: (i) 16,600,000 shares of our Common Stock issued pursuant to the Securities Purchase Agreement dated January 24, 2013 (the “Securities Purchase Agreement”); and (ii) 8,300,000 shares of Common Stock issuable upon exercise of five-year Warrants with an exercise price of \$0.75 issued pursuant to the Securities Purchase Agreement.

The table below presents information regarding the Selling Stockholders and the shares of our Common Stock that they may sell or otherwise dispose of from time to time under this prospectus. The table is based on information supplied to us by the Selling Stockholders. Percentages of beneficial ownership are based upon 88,245,725 shares of Common Stock issued and outstanding as of March 7, 2013. Beneficial ownership is determined under Section 13(d) of the Exchange Act and generally includes voting or investment power with respect to securities and including any securities that grant the Selling Stockholders the right to acquire Common Stock within 60 days of March 7, 2013. We do not know when or in what amounts the Selling Stockholders may sell or otherwise dispose of the shares covered hereby. The Selling Stockholders might not sell any or all of the shares covered by this prospectus or may sell or dispose of some or all of the shares other than pursuant to this prospectus. Because the Selling Stockholders may not sell or otherwise dispose of some or all of the shares covered by this prospectus and because there are currently no agreements, arrangements or understandings with respect to the sale or other disposition of any of the shares, we cannot estimate the number of the shares that will be held by the Selling Stockholders after completion of the offering.

Except as provided below, none of the Selling Stockholders has held any position or office or had any other material relationship with us or any of our predecessors or affiliates within the past three years other than as a result of the ownership of our securities. In addition, unless otherwise indicated in the footnotes below, we believe that: (i) none of the Selling Stockholders are broker-dealers or affiliates of broker-dealers, (ii) no Selling Stockholder has direct or indirect agreements or understandings with any person to distribute their shares, and (iii) the Selling Stockholders have sole voting and investment power with respect to all shares beneficially owned, subject to applicable community property laws. To the extent any Selling Stockholder identified below is, or is affiliated with, a broker-dealer, it could be deemed to be, under SEC Staff interpretations, an “underwriter” within the meaning of the Securities Act. Information about the Selling Stockholders may change over time. Any changed information will be set forth in supplements to this prospectus, if required.

Name of Selling Stockholder	Number of Shares of Common Stock Owned Prior to Offering ⁽¹⁾	Maximum Number of Shares of Common Stock to be Offered Pursuant to this Prospectus Number	Number of Shares of Common Stock Owned After Offering ⁽²⁾	
			Number	Percent
Anson Investments Master Fund LP ⁽³⁾	750,000	750,000	—	* %
Aspire Capital Fund, LLC ⁽⁴⁾	750,000	750,000	—	* %
Burguete Investment Partnership, L.P. ⁽⁵⁾	2,378,003	300,000	2,078,003	2.3 %
Capital Ventures International ⁽⁶⁾	750,000	750,000	—	* %
Cranshire Capital Master Fund, Ltd. ⁽⁷⁾	788,018	705,000	83,018	* %
Deerfield Special Situations Fund, L.P. ⁽⁸⁾	1,602,000	1,602,000	—	* %
Deerfield Special Situations International Master Fund, L.P. ⁽⁸⁾	1,398,000	1,398,000	—	* %
Dennis D. Gonyea	168,148	105,000	63,148	* %
Dorothy J. Hoel	128,148	105,000	23,148	* %
E Terry Skone TTEE E Terry Skone Rev Trust u/a dtd 11/30/2005	153,148	105,000	48,148	* %
Empery Asset Master, LTD ⁽⁹⁾	450,000	450,000	—	* %
Gary A. Bergren	244,722	150,000	94,722	* %
Hartz Capital Investments, LLC ⁽¹⁰⁾	450,000	450,000	—	* %
Horberg Enterprises Limited Partnership ⁽¹¹⁾	300,000	300,000	—	* %
Hudson Bay Master Fund Ltd ⁽¹²⁾	750,000	750,000	—	* %
Itasca Capital Partners, LLC ⁽¹³⁾	519,675	150,000	369,675	* %
JALAA Equities ⁽¹⁴⁾	750,000	750,000	—	* %
Midsummer Small Cap Master, Ltd ⁽¹⁵⁾	836,805	750,000	86,805	* %
Neal Goldman	750,000	750,000	—	* %
Parallax Biomedical Fund, LP ⁽¹⁶⁾	600,000	600,000	—	* %
Paul and Nancy Seel Joint Account WROS	128,148	105,000	23,148	* %
Preventive Cardiovascular Nurses Association ⁽¹⁷⁾	359,000	300,000	59,000	* %
Richard A. Hoel	75,000	75,000	—	* %
Robert G Allison	398,379	300,000	98,379	* %
Sabby Healthcare Volatility Master Fund, Ltd ⁽¹⁸⁾	2,100,000	2,100,000	—	* %
Sabby Volatility Warrant Master Fund, Ltd ⁽¹⁸⁾	900,000	900,000	—	* %
Seamark Fund, LP ⁽¹⁹⁾	300,000	300,000	—	* %
Sphinx Trading, LP ⁽²⁰⁾	45,000	45,000	—	* %
Third Security Incentive 2010 LLC ⁽²¹⁾	5,899,847	1,800,000	4,099,847	4.5 %
Third Security Senior Staff 2008 LLC ⁽²¹⁾	11,799,697	3,600,000	8,199,697	8.6 %
Third Security Staff 2010 LLC ⁽²¹⁾	11,799,697	3,600,000	8,199,697	8.6 %
William H. Baxter Trustee FBO William H. Baxter Revocable Trust u/a dtd 7/3/96	128,148	105,000	23,148	* %

*Represents less than 1%

14

The number of shares for each Selling Stockholder consists of the aggregate of the number of shares of Common
(1) Stock held by such Selling Stockholder and shares of Common Stock issuable upon exercise of Warrants held by such Selling Stockholder.

(2) For purposes of this table, the Company assumes that all of the shares covered by this prospectus will be sold by the Selling Stockholders.

(3) Moez Kassam is the Portfolio Manager of Anson Investments Master Fund LP and has voting and dispositive power over the shares beneficially owned by Anson Investments Master Fund LP.

Steven G. Martin, Erik J. Brown and Christos Komissopoulos, the principals of Aspire Capital Fund, LLC, are
(4) deemed to be beneficial owners of all of the shares of Common Stock owned by Aspire Capital Fund, LLC. Messrs. Martin, Brown and Komissopoulos have shared voting and dispositive power over the shares beneficially owned by Aspire Capital Fund, LLC.

James J. Tiampo, President of Verbier Management Corp., which is the general partner of Burguete Investment
(5) Partnership, LP, makes investment and voting decisions with respect to shares held by Burguete Investment Partnership, LP.

Heights Capital Management, Inc., the authorized agent of Capital Ventures International (“CVI”), has discretionary authority to vote and dispose of the shares held by CVI and may be deemed to be the beneficial owner of such shares. Martin Kobinger, in his capacity as Investment Manager of Heights Capital Management, Inc., may also be deemed to have investment discretion and voting power over the shares held by CVI. Mr. Kobinger disclaims any
(6) such beneficial ownership of the shares. CVI is affiliated with one or more FINRA members, none of whom are currently expected to participate in the sale pursuant to the prospectus contained in this registration statement. CVI has represented that it acquired the shares in the ordinary course of business and at the time of the acquisition of the shares, had no agreements or understandings, directly or indirectly, with any other person to distribute such shares.

Cranshire Capital Advisors, LLC (“CCA”) is the investment manager of Cranshire Capital Master Fund, Ltd. (“Cranshire Master Fund”) and has voting control and investment discretion over securities held by Cranshire Master
(7) Fund. Mitchell P. Kopin (“Mr. Kopin”), the president and the sole member of the Board of Managers of CCA, has voting control over CCA. As a result, each of Mr. Kopin and CCA may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended) of the securities held by Cranshire Master Fund.

CCA is also the investment manager for managed accounts for Freestone Advantage Partners II (“Freestone II”), and Sphinx Trading, LP (“Sphinx”), and CCA has voting control and investment discretion over securities in the managed accounts for Freestone II and Pyramid. Mr. Kopin, the president and the sole member of the Board of Managers of CCA, has voting control over CCA. As a result, each of Mr. Kopin and CCA also may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended) of 50,000

additional shares of Common Stock, consisting of (i) 5,000 shares of Common Stock that are issuable upon exercise of warrants held by Freestone II, (ii) 30,000 shares of Common Stock held by Sphinx, and (iii) 15,000 shares of Common Stock that are issuable upon exercise of warrants held by Sphinx.

(8) James E. Flynn has voting and dispositive power over the shares beneficially owned by Deerfield Special Situations Fund, L.P. and Deerfield Special Situations International Master Fund, L.P.

(9) Empery Asset Management LP, the authorized agent of Empery Asset Master Ltd (“EAM”), has discretionary authority to vote and dispose of the shares held by EAM and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by EAM. EAM, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares.

(10) Empery Asset Management LP, the authorized agent of Hartz Capital Investments, LLC (“HCI”), has discretionary authority to vote and dispose of the shares held by HCI and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by HCI. Mr. Hoe and Mr. Lane disclaim any beneficial ownership of these shares.

(11) Howard Todd Horberg has voting and dispositive power over the shares beneficially owned by Horberg Enterprises Limited Partnership.

(12) Hudson Bay Capital Management LP, the investment manager of Hudson Bay Master Fund Ltd., has voting and dispositive power over these securities. Sander Gerber is the managing member of Hudson Bay Capital GP LLC, which is the general partner of Hudson Bay Capital Management LP. Sander Gerber disclaims beneficial ownership over these securities.

(13) Michael S. Wallace, Managing Member of Itasca Capital Partners, LLC, makes investment and voting decisions with respect to shares held by Itasca Capital Partners, LLC.

(14) Jason M. Aryeh has voting and dispositive power over the shares beneficially owned by JALAA Equities.

(15) Joshua Thomas and Michel Amsalem have voting and dispositive power over the shares beneficially owned by Midsummer Small Cap Master, Ltd.

(16) Kellie Seringer has voting and dispositive power over the shares beneficially owned by Parallax Biomedical Fund, LP.

(17) Perkins Capital Management, Inc. votes proxies for Preventive Cardiovascular Nurses Association and through their power of attorney has full dispositive power over the shares beneficially owned by Preventive Cardiovascular Nurses Association.

(18) Hal Mintz has voting and dispositive power over the shares beneficially owned by Sabby Healthcare Volatility Master Fund, Ltd. and Sabby Volatility Warrant Master Fund, Ltd.

(19) David T. Harrington and John D. Fraser, Managing Partners of Seamark Fund, LP, have voting and dispositive power over the shares beneficially owned by Seamark Fund, LP.

(20) CCA is the investment manager of a managed account for Sphinx and has voting control and investment discretion over securities held in by Sphinx in such managed account. Mr. Kopin, the president and the sole member of the Board of Managers of CCA, has voting control over CCA. As a result, each of Mr. Kopin and CCA may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended) of the securities held by Sphinx in such managed account.

CCA is also the investment manager of Cranshire Master Fund and Freestone Advantage Partners II, LP. Mr. Kopin, the president and the sole member of the Board of Managers of CCA, has voting control over CCA. As a result, each of Mr. Kopin and CCA may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended) of the securities held by Cranshire Master Fund and Freestone II that are described in footnote 7.

Sphinx acquired the shares being registered hereunder in the ordinary course of business, and at the time of the acquisition of the shares and warrants described herein, Sphinx did not have any arrangements or understandings with any person to distribute such securities.

Randal J. Kirk makes investment and voting decisions with respect to shares held by the Third Security Entities. The Third Security Entities are the holders of all of the shares outstanding of our Series A Preferred and the amount of securities beneficially owned by each of the Third Security Entities includes shares of Common Stock issuable upon conversion of the outstanding shares of Series A Preferred and the conversion of shares of Series A (21) Preferred issuable upon exercise of warrants for shares of Series A Convertible Preferred Stock. The holders of Series A Preferred have the right to appoint two members to our Board of Directors. Robert M. Patzig and Doit L. Koppler II, employees of Third Security, LLC, which may be deemed to be an affiliate of the Company, serve as directors of the Company. Messrs. Patzig and Koppler were appointed directors of the Company in connection with the right of the holders of the Series A Convertible Preferred Stock to appoint two directors.

DESCRIPTION OF COMMON STOCK

General Matters

The Company's Board of Directors is authorized to issue up to 150,000,000 shares of Common Stock, from time to time, as provided in a resolution or resolutions adopted by the Board of Directors.

Common Stock

As of March 7, 2013, 88,245,725 shares of our Common Stock were issued and outstanding, held by approximately 3,200 stockholders of record, not including beneficial holders whose shares are held in names other than their own.

Dividends, Voting Rights and Liquidation

Holders of Common Stock are entitled to one vote for each share held of record on all matters submitted to a vote of the shareholders and do not have cumulative voting rights. Holders of Common Stock are entitled to receive ratably such dividends, if any, as may be declared from time to time by our Board of Directors out of funds legally available for dividend payments. All outstanding shares of Common Stock are fully paid and non-assessable. The holders of Common Stock have no preferences or rights of conversion, exchange, pre-emption or other subscription rights. There are no redemption or sinking fund provisions applicable to the Common Stock. In the event of any liquidation, dissolution or winding-up of our affairs, holders of Common Stock will be entitled to share ratably in our assets that are remaining after payment or provision for payment of all of our debts and obligations. The rights, preferences and privileges of Common Stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock currently outstanding or which we may designate and issue in the future.

Preferred Stock

General Matters

Under our Third Amended and Restated Certificate of Incorporation (the “Certificate of Incorporation”), we have the authority to issue up to 15,000,000 shares of preferred stock, \$0.01 par value per share (“Preferred Stock”), issuable in specified series and having specified voting, dividend, conversion, liquidation, and other rights and preferences as our Board of Directors may determine, subject to limitations set forth in our Certificate of Incorporation. The Preferred Stock may be issued for any lawful corporate purpose without further action by our stockholders. The issuance of any Preferred Stock having conversion rights might have the effect of diluting the interests of our other stockholders. In addition, shares of Preferred Stock could be issued with rights, privileges and preferences which would deter a tender or exchange offer or discourage the acquisition of control of the Company.

Series A Convertible Preferred Stock

Of the number of shares of Preferred Stock authorized by our Certificate of Incorporation, as of March 7, 2013, 3,879,307 shares had been designated Series A Convertible Preferred Stock with such rights, privileges and preferences as set forth in the Certificate of Designation of Series A Convertible Preferred Stock and filed with the Secretary of State of the State of Delaware on December 28, 2010, as amended by the Certificate of Amendment of Certificate of Designation of Series A Convertible Preferred Stock filed with the Secretary of State of the State of Delaware on May 25, 2012 (as amended, the “Certificate of Designation”). As of March 7, 2013, 2,586,205 shares of the Series A Convertible Preferred Stock (the “Series A Preferred”) were issued and outstanding.

Certain rights of the holders of the Series A Preferred are senior to the rights of the holders of our Common Stock. The Series A Preferred has a liquidation preference equal to its original price per share, plus any accrued and unpaid dividends thereon. The Series A Preferred accrues cumulative dividends at the rate of 10.0% of the original price per share per annum.

All outstanding shares of Series A Preferred will be automatically converted into Common Stock, at an initial conversion rate of 4:1, at the election of the holders of a majority of the then-outstanding shares of Series A Preferred. The initial conversion rate for the Series A Preferred is subject to adjustment in the event of certain stock splits, stock dividends, mergers, reorganizations and reclassifications.

The Certificate of Designation provides that the holders of Series A Preferred shall be entitled, as a separate voting group, at each annual or special election of directors, to elect two directors of the Company.

Generally, the holders of the Series A Preferred are entitled to vote together as a single group with the holders of Common Stock on an as-converted basis. However, the Certificate of Designation provides that we will not perform the following activities, subject to certain exceptions, without the affirmative vote of a majority of the holders of the outstanding shares of Series A Preferred:

authorize, create or issue any other class or series of capital stock having rights, preferences or privileges senior to or in parity with the Series A Preferred;

alter or change the rights, preferences or privileges of the Series A Preferred or increase or decrease the authorized number of shares of Series A Preferred;

authorize or declare any dividends on the common shares or any other shares of capital stock other than the Series A Preferred;

- authorize any offering of equity securities of the Company representing (on a pro forma basis after giving effect to the issuance of such equity securities) the right to receive not less than 10% of any amounts or funds that would, as of immediately following such issuance, be legally available for distribution in connection with a liquidation event;

redeem any shares of capital stock (other than pursuant to employee agreements or the terms of the capital stock);

- increase or decrease the authorized number of members of the Board;
- enter into any binding agreement with any director, employee or any affiliate of the Company;

materially change the nature of the Company's business, enter into new lines of business or exit the current line of business or invest in any person or entity engaged in a business that is not substantially similar to the Company's business, or change the location of any permanent location of any part of the Company's business, in each case except as contemplated by the Asset Purchase Agreement dated as of November 29, 2010, by and among PGxHealth, LLC, Clinical Data, Inc. and Transgenomic (the "Purchase Agreement") or any of the transaction documents included therein;

make any loans or advances, individually or in the aggregate in excess of \$1,000,000, to, or own any securities of, any subsidiary or other corporation or other entity unless it is wholly owned by the Company;

- make any loan or advance to any natural person, including, without limitation, any employee or director of the Company, except advances and similar expenditures in the ordinary course of business;

- guarantee, directly or indirectly, any indebtedness, except for trade accounts of the Company arising in the ordinary course of business;
- sell or otherwise dispose of any assets of the Company with a value, individually or collectively, in excess of \$500,000, other than in the ordinary course of business;

liquidate or wind-up the business and affairs of the Company or effect a change in control or any other liquidation event;

incur any indebtedness in excess of \$1,000,000 in the aggregate, other than trade credit incurred in the ordinary course of business or as contemplated by the Purchase Agreement;

expend funds in excess of \$500,000 in the aggregate per year for capital improvements, other than any such expenditure that is consistent with a budget approved by the Board, including the directors elected by the holders of Series A Preferred or as contemplated by the Purchase Agreement;

- obligate the Company to make aggregate annual payments in excess of \$500,000 or sell, transfer or license any material technology or intellectual property of the Company, other than a non-exclusive license in the ordinary course of business, in each case except as contemplated by the Purchase Agreement; or

increase the number of shares reserved and issuable under any of the Company's equity or option incentive compensation plans.

Anti-Takeover Effects Under Section 203 of the Delaware General Corporation Law

We are subject to Section 203 of the General Corporation Law of the State of Delaware (the "DGCL"), which prohibits a Delaware corporation from engaging in any business combination with any interested stockholder for a period of three years after the date that such stockholder became an interested stockholder, with the following exceptions:

before such date, the board of directors of the corporation approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder;

upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction began, excluding for purposes of determining the voting stock outstanding (but not the outstanding voting stock owned by the interested stockholder) those shares owned (i) by persons who are directors and also officers and (ii) employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or an exchange offer; or

on or after such date, the business combination is approved by the board of directors and authorized at an annual or a special meeting of the stockholders, and not by written consent, by the affirmative vote of at least 66²/₃% of the outstanding voting stock that is not owned by the interested stockholder.

In general, Section 203 defines "business combination" to include the following:

any merger or consolidation involving the corporation or any direct or indirect majority owned subsidiary of the corporation and the interested stockholder or any other corporation, partnership, unincorporated association, or other entity if the merger or consolidation is caused by the interested stockholder and as a result of such merger or consolidation the transaction is not excepted as described above;

any sale, transfer, pledge, or other disposition (in one transaction or a series) of 10% or more of the assets of the corporation involving the interested stockholder;

subject to certain exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder;

any transaction involving the corporation that has the effect of increasing the proportionate share of the stock or any class or series of the corporation beneficially owned by the interested stockholder; or

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

In general, Section 203 defines an "interested stockholder" as an entity or a person who, together with the person's affiliates and associates, beneficially owns, or within three years prior to the time of determination of interested stockholder status did own, 15% or more of the outstanding voting stock of the corporation.

A Delaware corporation may "opt out" of these provisions with an express provision in its original certificate of incorporation or an express provision in its certificate of incorporation or bylaws resulting from a stockholders' amendment approved by at least a majority of the outstanding voting shares. We have not opted out of these provisions. As a result, mergers or other takeover or change in control attempts of us may be discouraged or prevented.

Anti-Takeover Effects Under Certain Provisions of our Certificate of Incorporation and Bylaws

Our Certificate of Incorporation and our Amended and Restated Bylaws ("Bylaws") include a number of provisions that may have the effect of deterring hostile takeovers or delaying or preventing changes in control or management of the Company.

First, our Certificate of Incorporation provides that all stockholder actions must be effected at a duly called meeting of holders and not by a consent in writing.

Second, our Bylaws provide that special meetings of the holders may be called only by the chairman of the Board of Directors, the Chief Executive Officer or our Board of Directors pursuant to a resolution adopted by a majority of the total number of authorized directors.

Third, our Certificate of Incorporation provides that our Board of Directors can issue up to 15,000,000 shares of Preferred Stock, as described under "Preferred Stock" above.

Fourth, our Certificate of Incorporation and the Bylaws provide for a classified Board of Directors in which approximately one-third of the directors would be elected each year. Consequently, any potential acquirer would need to successfully complete two proxy contests in order to take control of the Board of Directors. As a result of the provisions of the Certificate of Incorporation and Delaware law, stockholders will not be able to cumulate votes for directors.

Fifth, our Certificate of Incorporation prohibits a business combination with an interested stockholder without the approval of the holders of 75% of all voting shares and the vote of a majority of the voting shares held by disinterested stockholders, unless it has been approved by a majority of the disinterested directors.

Finally, our Bylaws establish procedures, including advance notice procedures, with regard to the nomination of candidates for election as directors and stockholder proposals. These provisions of our Third Amended and Restated Certificate of Incorporation and our Amended and Restated Bylaws could discourage potential acquisition proposals and could delay or prevent a change in control of the management of our company.

Warrants

In addition to the Warrants to purchase 8,300,000 of the shares of Common Stock we are registering hereunder, as of March 7, 2013, warrants to purchase 13,171,268 shares of Common Stock with an average exercise price of \$1.08 per share were outstanding, and warrants to purchase 1,293,102 shares of Series A Preferred with an average exercise price of \$2.32 per share were outstanding which may be converted into 5,172,408 shares of common stock. All of the outstanding warrants are currently exercisable, and all outstanding warrants contain provisions for the adjustment of the exercise price in the event of stock dividends, stock splits, reorganizations, reclassifications or mergers. In addition, certain of the warrants contain a "cashless exercise" feature that allows the holders thereof to exercise the warrants without a cash payment to us under certain circumstances.

Listing

Our Common Stock is traded on the OTC Bulletin Board under the symbol “TBIO”.

Transfer Agent and Registrar

Wells Fargo Bank Minnesota, N.A., is the transfer agent and registrar for our Common Stock. Their address is Shareowner Services, P.O. Box 64854, St. Paul, MN 55164-0854, and their telephone number is (800) 478-9715.

LEGAL MATTERS

The validity of our Common Stock offering hereby will be passed upon for us by Paul Hastings LLP.

EXPERTS

The audited consolidated financial statements of Transgenomic, Inc. and its subsidiaries as of December 31, 2012 and 2011, and for the three-year period ended December 31, 2012, included in our Annual Report on Form 10-K for the year ended December 31, 2012, and the effectiveness of our internal control over financial reporting as of December 31, 2012, incorporated by reference in this prospectus have been audited by McGladrey LLP, independent registered public accounting firm, as stated in their report dated March 14, 2013, which is incorporated by reference herein, and has been so incorporated in reliance upon the report of such firm given upon their authority as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We file annual, quarterly and current reports, proxy statements and other documents with the SEC. These filings contain important information which does not appear in this prospectus. You may read and copy, at prescribed rates, any documents we have filed with the SEC at its Public Reference Room located at 100 F Street, N.E., Washington, DC 20549. You may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. We also file these documents with the SEC electronically. You can access the electronic versions of these filings on the SEC's website found at <http://www.sec.gov>.

We have filed with the SEC a registration statement on Form S-1 relating to the securities covered by this prospectus. This prospectus is a part of the registration statement and does not contain all the information in the registration statement. Whenever a reference is made in this prospectus to a contract, agreement or other document, the reference is only a summary and you should refer to the exhibits that are filed with, or incorporated by reference into, the registration statement for a copy of the contract, agreement or other document. You may review a copy of the registration statement at the SEC's Public Reference Room in Washington, D.C., as well as on the SEC's website.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC's rules allow us to "incorporate by reference" into this prospectus certain information that we file with the SEC. This means that we can include in this prospectus information by referring you to another document already on file with the SEC that contains that information. Any information incorporated by reference into this prospectus is considered to be part of this prospectus.

We incorporate by reference the following documents filed with the SEC:

Our Annual Report on Form 10-K for the year ended December 31, 2012, as filed by us with the SEC on March 14, 2013;

- Our Current Report on Form 8-K as filed by us with the SEC on January 25, 2013;
- Our Current Report on Form 8-K/A as filed by us with the SEC on January 31, 2013;
- Our Current Report on Form 8-K as filed by us with the SEC on February 8, 2013; and
- Our Current Report on Form 8-K as filed by us with the SEC at 4:08 p.m. (Eastern Time) on March 13, 2013.

Notwithstanding the foregoing, we are not incorporating by reference any information furnished and not filed with the SEC, unless, and to the extent, expressly specified otherwise. Any statement contained in a document incorporated in this prospectus shall be deemed to be modified or superseded to the extent that a statement contained in this prospectus modifies or supersedes such statement. Any such statement so modified or superseded shall only be deemed to be a part of this prospectus as so modified or superseded.

We will provide without charge to each person, including any beneficial owner, to whom this prospectus is delivered, upon his or her written or oral request, a copy of any or all of the reports or documents referred to above that have been incorporated by reference into this prospectus, excluding exhibits to those documents unless they are specifically incorporated by reference into those documents. You may request a copy of these filings, at no cost, by contacting:

Transgenomic, Inc.

Attn: Investor Relations

12325 Emmet Street

Omaha, NE 68164

Phone: (402) 452-5416

Fax: (402) 452-5461

E-mail: investorrelations@transgenomic.com

You also may access these filings on our website at www.transgenomic.com under Investor Relations Real Time Filings. We do not incorporate the information on our website into this prospectus or any supplement to this prospectus and you should not consider any information on, or that can be accessed through, our website as part of this prospectus or any supplement to this prospectus (other than those filings with the SEC that we specifically incorporate by reference into this prospectus or any supplement to this prospectus).

24,900,000 SHARES OF COMMON STOCK

TRANSGENOMIC, INC.

PROSPECTUS

March 29, 2013

Neither we nor the Selling Stockholders have authorized any dealer, salesperson or other person to give any information or to make any representations not contained in this prospectus or any prospectus supplement. You must not rely on any unauthorized information. This prospectus is not an offer to sell these securities in any jurisdiction where an offer or sale is not permitted. The information in this prospectus is current as of the date of this prospectus. You should not assume that this prospectus is accurate as of any other date.