

TRANSGENOMIC INC
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Registration No. 333-201907

PROSPECTUS SUPPLEMENT

(To Prospectus dated February 13, 2015)

\$3,500,000

TRANSGENOMIC, INC.

Common Stock

Transgenomic, Inc. has entered into an At the Market Offering Agreement, or the Sales Agreement, with Craig-Hallum Capital Group LLC, or Craig-Hallum, relating to shares of our common stock that may be offered by this prospectus supplement and the accompanying prospectus. In accordance with the terms of the Sales Agreement, we may offer and sell an aggregate of up to \$3,500,000 of common stock from time to time through Craig-Hallum, as sales manager.

Craig-Hallum is not required to sell any specific number or dollar amount of shares of our common stock but will use its commercially reasonable efforts, as our agent and subject to the terms of the Sales Agreement, to sell the shares offered by this prospectus supplement and the accompanying prospectus. Sales of the shares, if any, will be made in an “at the market” offering as defined in Rule 415 of the Securities Act of 1933, as amended, or the Securities Act. Specifically, sales in this offering will be made directly on the Nasdaq Capital Market, the existing trading market for our common stock, or on any other existing trading market for our common stock, at market prices prevailing at the time of sale. In the event any sales are made pursuant to the Sales Agreement which are not made directly on the Nasdaq Capital Market or on any other existing trading market for our common stock at market prices at the time of sale, including, without limitation, any sales to the sales agent acting as principal or sales in privately negotiated transactions, we will file a prospectus supplement describing the terms of such transaction, the amount of shares sold, the price thereof, the applicable compensation, and such other information as may be required pursuant to Rule 424 and Rule 430B of the Securities Act, as applicable, within the time required by Rule 424 of the Securities Act.

Craig-Hallum will receive from us a commission of 3.25% based on the gross sales price per share for any shares sold through it as agent under the Sales Agreement. We have also agreed to reimburse certain expenses of Craig-Hallum in connection with the Sales Agreement. The net proceeds to us that we receive from sales of our common stock will depend on the number of shares actually sold and the offering price for such shares. The actual proceeds to us will vary, but will not exceed \$3,500,000 in the aggregate. See “Plan of Distribution” beginning on page S-15 of this prospectus supplement. In connection with the sale of shares of our common stock on our behalf, Craig-Hallum may be deemed to be an “underwriter” within the meaning of the Securities Act, and the compensation of Craig-Hallum may be deemed to be underwriting commissions or discounts.

Our common stock is listed on Nasdaq Capital Market under the symbol “TBIO.” On June 6, 2016, the last sale price of our shares of common stock as reported on the Nasdaq Capital Market was \$0.60 per share.

As of June 6, 2016, the aggregate market value of our outstanding common stock held by non-affiliates was \$11.2 million based on 22,846,408 shares of outstanding common stock, of which 15,288,240 shares are held by non-affiliates, and a per share price of \$0.73, based on the closing bid price of our common stock as quoted on the Nasdaq Capital Market on April 20, 2016. We have not offered or sold any securities pursuant to General Instruction I.B.6. of Form S-3 during the 12 calendar months prior to and including the date of this prospectus supplement.

Investing in our common stock involves risks, including those described in the “Risk Factors” section beginning on page S-5 of this prospectus supplement, in our Annual Report on Form 10-K for the fiscal year ended December 31, 2015 and in our Quarterly Report on Form 10-Q for the quarter ended March 31, 2016, which are incorporated herein by reference.

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

Craig-Hallum Capital Group

The date of this prospectus supplement is June 7, 2016

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Prospectus

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ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying prospectus are part of a registration statement that we filed with the Securities Exchange Commission, or the SEC, utilizing a “shelf” registration process. This document is in two parts. The first part is the prospectus supplement, including the documents incorporated by reference, which relates only to an offering of common stock having an aggregate offering price of up to \$3,500,000 through Craig-Hallum. These sales, if any, will be made pursuant to the terms of the Sales Agreement entered into between us and Craig-Hallum on June 7, 2016, a copy of which has been filed with the SEC as an exhibit to a Current Report on Form 8-K and which is incorporated herein by reference.

The second part, the accompanying prospectus, including the documents incorporated by reference, provides more general information. Generally, when we refer to this prospectus, we are referring to both parts of this document combined. Before you invest, you should carefully read this prospectus supplement, the accompanying prospectus, all information incorporated by reference herein and therein, as well as the additional information described under “Where You Can Find More Information” and “Information Incorporated by Reference”.

These documents contain information you should consider when making your investment decision. This prospectus supplement may add, update or change information contained in the accompanying prospectus. To the extent that any statement that we make in this prospectus supplement is inconsistent with statements made in the accompanying prospectus or any documents incorporated by reference, the statements made in this prospectus supplement will be deemed to modify or supersede those made in the accompanying prospectus and such documents incorporated by reference.

You should rely only on the information contained or incorporated by reference in this prospectus supplement, the accompanying prospectus, the documents incorporated by reference therein and any free writing prospectus we provide you. We have not, and Craig-Hallum has not, authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not, and Craig-Hallum is not, making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus supplement, the accompanying prospectus, the documents incorporated by reference in this prospectus supplement and the accompanying prospectus and any free writing prospectus we provide you is accurate only as of the date on those respective documents. Our business, financial condition, results of operations and prospects may have changed since those dates. You should read this prospectus supplement and the accompanying prospectus, including the documents incorporated by reference in this prospectus supplement and the accompanying prospectus, when making your investment decision. You should also read and consider the information in the documents we have referred you to in the sections of this prospectus supplement entitled “Where You Can Find More Information” and “Information Incorporated by Reference.” The distribution of this prospectus supplement and the offering of the common stock in certain jurisdictions may be restricted by law. Persons outside the United States, or the U.S., who come into possession of this prospectus supplement must inform themselves about, and observe any restrictions relating to, the offering of the common stock

and the distribution of this prospectus supplement outside the U.S. This prospectus supplement does not constitute, and may not be used in connection with, an offer to sell, or a solicitation of an offer to buy, any securities offered by this prospectus supplement by any person in any jurisdiction in which it is unlawful for such person to make such an offer or solicitation.

Unless otherwise indicated, information contained in this prospectus supplement, the accompanying prospectus or the documents incorporated by reference, concerning our industry and the markets in which we operate, including our general expectations and market position, market opportunity and market share, is based on information from our own management estimates and research, as well as from industry and general publications and research, surveys and studies conducted by third parties. Management estimates are derived from publicly available information, our knowledge of our industry and assumptions based on such information and knowledge, which we believe to be reasonable. In addition, assumptions and estimates of our and our industry's future performance are necessarily subject to a high degree of uncertainty and risk due to a variety of factors, including those described in "Risk Factors" in this prospectus supplement, the accompanying prospectus, in our Annual Report on Form 10-K for the fiscal year ended December 31, 2015 and in our Quarterly Report on Form 10-Q for the quarter ended March 31, 2016, which are incorporated by reference into this prospectus supplement. These and other important factors could cause our future performance to differ materially from our assumptions and estimates. See "Disclosure Regarding Forward-Looking Statements."

General information about us can be found on our website at www.transgenomic.com. The information on our website is for informational purposes only and should not be relied on for investment purposes. The information on our website is not incorporated by reference into either this prospectus supplement or the accompanying prospectus and should not be considered part of this or any other report filed with the SEC.

PROSPECTUS SUPPLEMENT SUMMARY

This summary highlights selected information contained elsewhere or incorporated by reference in this prospectus supplement. This summary does not contain all the information that you should consider before investing in our common stock. Before making an investment decision, to fully understand this offering and its consequences to you, you should carefully read this entire prospectus supplement and the accompanying prospectus, including the “Risk Factors” of this prospectus supplement, the financial statements and related notes, and the other information that we incorporate by reference into this prospectus supplement, including the section “Risk Factors” in our Annual Report on Form 10-K for the fiscal year ended December 31, 2015 and in our Quarterly Report on Form 10-Q for the quarter ended March 31, 2016. This prospectus supplement contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from the results anticipated in these forward-looking statements as a result of factors described under the “Risk Factors” section and elsewhere in this prospectus supplement. Unless the context otherwise requires, any reference to “Transgenomic,” the “Company,” “we,” “our” and “us” in this prospectus supplement refers to Transgenomic, Inc. and its subsidiaries.

Transgenomic, Inc.

We are a biotechnology company advancing personalized medicine for the detection and treatment of cancer and inherited diseases through our proprietary molecular technologies and clinical and research services. A key goal is to bring our Multiplexed ICE COLD-PCR, or MX-ICP, product to the clinical market through strategic partnerships and licensing agreements, enabling the use of blood and other bodily fluids for more effective and patient-friendly diagnosis, monitoring and treatment of cancer.

MX-ICP is technology proprietary to Transgenomic. It is a reagent that improves the ability to detect genetic mutations by 100 - 400 fold over existing technologies. This technology has been validated internally on all currently available sequencing platforms, including Sanger, Next Gen Sequencing and Digital PCR. By enhancing the level of detection of genetic mutations and suppressing the normal, or wild-type DNA, several benefits are provided. It is generally understood that most current technologies are unable to consistently identify mutations that occur in less than approximately 5% of a sample. However, many mutations found at much lower levels, even as low as 0.01%, are known to be clinically relevant and can have significant consequences to a patient: both in terms of how they will respond to a given drug or treatment and how a given tumor is likely to change over time. More importantly, in our view, is the ability to significantly improve the level of detection while using blood, saliva and even urine as a source for DNA, rather than depending on painful, expensive and potentially dangerous tumor biopsies.

We believe that this is an important advancement in patient care with respect to cancer detection, treatment and monitoring and can result in significant cost savings for the healthcare system by replacing invasive procedures with the simple collection of blood or other bodily fluids. By broadening the types of samples that can be used for testing

and allowing all sequencing platforms to provide improved identification of low level mutations, MX-ICP has the potential to make testing more readily available, more patient friendly, enable genetic monitoring of disease progression, effectively guide treatment protocols, and reduce the overall cost of diagnosis and monitoring while significantly improving patient outcomes.

Historically, our operations were organized and reviewed by management along our major product lines and presented in two business segments: Laboratory Services and Genetic Assays and Platforms. Beginning with the quarter ended September 30, 2015, our operations are now organized as one business segment, our Laboratory Services segment, and during the fourth quarter of 2015, we began including a portion of our Laboratory Services segment as discontinued operations.

Our laboratory in Omaha, Nebraska is focused on providing genetic analytical services related to oncology and pharmacogenomics research services supporting Phase II and Phase III clinical trials conducted by pharmaceutical and biotechnology companies. Our laboratory employs a variety of genomic testing service technologies, including our proprietary MX-ICP technology. ICE COLD-PCR is a proprietary ultra-high sensitivity platform technology with breakthrough potential to enable wide adoption of personalized, precision medicine in cancer and other diseases. It can be run in any laboratory that contains standard PCR systems. MX-ICP enables detection of multiple known and unknown mutations from virtually any sample type, including tissue biopsies, blood, urine, saliva, cell-free DNA and circulating tumor cells at levels greater than 1,000-fold higher than standard DNA sequencing techniques. It is easy to implement and use within existing workflows. Our laboratory in Omaha is certified under the Clinical Laboratory Improvement Amendments, or CLIA, as a high complexity laboratory and is accredited by the College of American Pathologists.

We are subject to a number of claims of various amounts that arise out of the normal course of our business. In our opinion, the disposition of pending claims, in excess of recorded accruals, could have a material adverse effect on our financial position, results of operations or cash flows. On February 25, 2016, the Board of Regents of the University of Nebraska, or UNMC, filed a lawsuit against us in the District Court of Douglas County, Nebraska, for breach of contract and seeking recovery of \$0.7 million owed by us to UNMC. We and UNMC are currently in discussions to determine a mutually agreeable means by which to settle the outstanding liability. A \$0.7 million liability has been recorded and is reflected in accrued expenses at December 31, 2015 and March 31, 2016. In addition, on April 13, 2016, Fox Chase Cancer Center, or Fox Chase, filed a lawsuit against us in the Court of Common Pleas of Philadelphia County, First Judicial District of Pennsylvania Civil Trial Division alleging, among other things, breach of contract, tortious interference with present and prospective contractual relations, unjust enrichment and fraudulent conversion, conspiracy and seeking punitive damages in addition to damages and other relief. This lawsuit relates to a license agreement we entered into with Fox Chase in August 2000, as amended, or the License Agreement, as well as the assignment of certain of our rights under the License Agreement to Integrated DNA Technologies, Inc., or IDT, pursuant to the Surveyor Kit Patent, Technology and Inventory Purchase Agreement we entered into with IDT effective as of July 1, 2014, or the IDT Agreement. Pursuant to the terms of the IDT Agreement, we agreed to indemnify IDT with respect to certain of the claims asserted in the Fox Chase proceeding. We believe that we have good and substantial defenses to the claims asserted by Fox Chase. We are unable to determine whether any loss will occur or to estimate the range of such potential loss, and there is no guarantee that we will prevail in this suit or receive any damages or other relief if we do prevail.

The outcome of legal proceedings and claims brought against us are subject to significant uncertainty. Therefore, although management considers the likelihood of such an outcome to be remote, if one or more of these legal matters were resolved against us in the same reporting period for amounts in excess of management's expectations, our financial statements for such reporting period could be materially adversely affected. In general, the resolution of a legal matter could prevent us from offering our services or products to others, could be material to our financial condition or cash flows, or both, or could otherwise adversely affect our operating results.

We were incorporated in Delaware on March 6, 1997. Our principal office is located at 12325 Emmet Street, Omaha, Nebraska 68164 and our telephone 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.

For a complete description of our business, financial condition, results of operations and other important information, we refer you to our filings with the SEC, that are incorporated by reference in this prospectus, including our Annual Report on Form 10-K for the year ended December 31, 2015 and our Quarterly Report on Form 10-Q for the quarter ended March 31, 2016. For instructions on how to find copies of these documents, see "Where You Can Find More Information".

THE OFFERING

The following is a brief summary of the terms of this offering.

Issuer	Transgenomic, Inc.
Common stock to be offered by us pursuant to this prospectus supplement	Up to \$3,500,000 of common stock.
Common stock to be outstanding after the offering	Up to 28,679,741 shares, assuming sales of all shares hereunder at a price of \$0.60 per share, which was the closing price on the Nasdaq Capital Market on June 6, 2016. Actual shares issued will vary depending on the sales prices under this offering
Manner of offering	Sales of shares of our common stock, if any, will be made pursuant to the terms of the Sales Agreement entered into between us and Craig-Hallum on June 7, 2016. Sales of the shares, if any, will be made in an “at the market offering”, as defined in Rule 415 under the Securities Act. Specifically, sales will be made directly on the Nasdaq Capital Market, the existing trading market for our common stock, or on any other existing trading market for our common stock, at market prices prevailing at the time of sale. Craig-Hallum will make these sales using commercially reasonable efforts consistent with its normal trading and sales practices and applicable law, on mutually agreeable terms between Craig-Hallum and us. The net proceeds to us that we receive from sales of our common stock will depend on the number of shares actually sold and the offering price for such shares. The actual proceeds to us will vary.
Use of proceeds	We intend to apply the net proceeds of this offering to working capital and general corporate purposes, which may include, without limitation, supporting asset growth and engaging in acquisitions or other business combinations. We also may use a portion of the proceeds to repay debt. We reserve the right, at the sole discretion of our Board of Directors, to reallocate the proceeds of this offering in response to developments in our business and other factors.
Nasdaq symbol for common stock	Our common stock is listed on the Nasdaq Capital Market under the symbol “TBIO.”
Risk factors	See “Risk Factors” and other information included in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference in this prospectus supplement and the accompanying prospectus for a discussion of factors you should carefully consider before deciding to invest in our securities.

Except as otherwise indicated, the information contained in this prospectus supplement assumes the sale of all of the shares offered hereby assuming sales of all shares hereunder at a price of \$0.60 per share, which was the closing price on the Nasdaq Capital Market on June 6, 2016.

The number of shares of common stock to be outstanding after this offering is based on 22,846,408 shares of common stock outstanding as of May 31, 2016 and does not take into account, as of May 31, 2016:

· 1,120,328 shares of our common stock issuable upon exercise of outstanding stock options to purchase shares of our common stock at a weighted average exercise price of \$3.42 per share;

· 98,333 shares of our common stock issuable upon exercise of outstanding stock appreciation rights with a weighted average exercise price of \$4.14 per share;

· 372,741 shares of our common stock reserved for issuance under our 2006 Equity Incentive Plan, as amended;

· 241,705 shares of our Series A-1 Convertible Preferred Stock, which are convertible into shares of our common stock at a rate of 1-for-1, subject to certain adjustments;

· 8,853,905 shares of our common stock issuable in connection with our outstanding warrants with a weighted average exercise price of \$3.10 per share; and

· shares of our common stock issuable upon conversion of our unsecured outstanding convertible promissory notes in the aggregate principal amount of \$571,250.

RISK FACTORS

Investing in any securities offered pursuant to this prospectus and the applicable prospectus supplement involves a high degree of risk. Before making an investment decision, you should carefully consider the risks described under “Risk Factors” in any applicable prospectus supplement and in our Annual Report on Form 10-K for the year ended December 31, 2015 filed with the SEC on April 14, 2016, and our Quarterly Report on Form 10-Q for the quarter ended March 31, 2016 filed with the SEC on May 23, 2016, together with all of the other information appearing in or incorporated by reference into this prospectus supplement, before deciding whether to purchase any of the securities being offered. Our business, financial condition or results of operations could be materially adversely affected by any of these risks. The occurrence of any of these risks might cause you to lose all or part of your investment in the offered securities. Additional risks not presently known to us or that we currently believe are immaterial may also significantly impair our business operations.

Risks Related to our Business

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, 2015 and 2014 was \$9.2 million and \$10.6 million, respectively, and for the three months ended March 31, 2016 and 2015 was \$2.2 million and \$2.0 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 and merger and acquisition costs.

Recurring operating losses raise substantial doubt about our ability to continue as a going concern.

We have incurred substantial operating losses and have used cash in our operating activities for the past several years. As of March 31, 2016, we had negative working capital of approximately \$15.2 million.

The audit report issued by our independent registered public accounting firm for our financial statements for the fiscal year ended December 31, 2015 states that our independent registered public accounting firm has substantial doubt in our ability to continue as a going concern due to the risk that we may not have sufficient cash and liquid assets at December 31, 2015 to cover our operating and capital requirements for the next 12 months. If that is the case, and if sufficient cash cannot be obtained, we would have to substantially alter, or possibly even discontinue, operations.

Additionally, as of March 31, 2016, we do not believe that we will have sufficient cash to meet our operating requirements for at least the next 12 months. Our financial statements and related notes thereto incorporated by reference in this prospectus supplement do not include any adjustments that might result from the outcome of this uncertainty.

Our current operating plan projects improved operating results, improvement in collection rates and monetization of underutilized assets. There are no guarantees that these efforts will be successful and, if not, we may use more cash than projected and not be able to meet our current obligations. As with any operating plan, there are risks associated with our ability to execute it. Therefore, there can be no assurance that we will be able to satisfy our obligations, or achieve the operating improvements as contemplated by the current operating plan. If we are unable to execute this plan, we will need to find additional sources of cash not contemplated by the current operating plan and/or raise additional capital to sustain continuing operations as currently contemplated. We could seek to raise additional funds through various potential sources such as through the sale of assets or sale of debt or equity securities. However, there can be no assurance that the additional funding sources will be available to us at reasonable terms or at all. If we are unable to achieve our operating plan or obtain additional financing, our business would be jeopardized and we may not be able to continue as a going concern.

We have substantial debt and other financial obligations and we may incur even more debt, and, as of March 31, 2016, we were not in compliance with certain financial covenants contained in our loan agreement with affiliates of Third Security, LLC. If we default under the loan agreement, the lenders will have the right to cease making additional advances, accelerate repayment of all sums due and take action to collect the amounts owed to them, including foreclosing on their security interest, each of which could adversely affect us.

Our revolving line of credit and term loan with affiliates of Third Security, LLC, a related party, or the Lenders, are governed by a Loan and Security Agreement, as amended, or the Loan and Security Agreement, which contains certain affirmative and negative covenants. As of March 31, 2016, we had borrowings of \$6.8 million under the Loan and Security Agreement. Under the term loan, we agreed not to, among other things, (i) pledge or otherwise encumber our assets other than to the Lenders, (ii) enter into additional borrowings or guarantees, (iii) repurchase our capital stock, or (iv) enter into certain mergers or acquisitions without the Lenders' consent. To secure the repayment of amounts borrowed under the revolving line of credit and term loan, we granted the Lenders a security interest in all of our assets. As of March 31, 2016, we were not in compliance with the financial covenants and certain other obligations applicable to us under the Loan and Security Agreement and had an outstanding overadvance in the amount of \$0.5 million and, therefore, we were in default under the Loan and Security Agreement. Effective June 6, 2016, we entered into an amendment to the Loan and Security Agreement with the Lenders. The amendment, among other things, (i) provides that the Lenders will waive the specified events of default under the terms of the Loan and Security Agreement, (ii) amends the prepayment terms of the Loan and Security Agreement, (iii) provides for the reduction of amounts available under the revolving line of credit upon the prepayment or repayment of certain amounts by us, (iv) removes the minimum liquidity ratio and minimum net revenue financial covenants that were previously applicable to us under the Loan and Security Agreement, (v) amends the circumstances pursuant to which we may engage in certain sales or transfers of our business or property without the consent of the Lenders, and (vi) capitalizes certain amounts owed by us to the Lenders and adds such overdue amounts to the outstanding principal amount of the revolving line of credit. However, there can be no assurance that we will not default under the Loan and Security Agreement in the future or that, if we do, the Lenders will waive any or all of the events of default. If we are unable to maintain compliance with the terms of the Loan and Security Agreement, the Lenders will have the right, among other things, to cease making additional advances, accelerate repayment of all sums due and take action to

collect the amounts owed to them, including foreclosing on their security interest or forcing us into bankruptcy, which would have a material adverse effect on our financial condition and results of operations.

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We may be required to amend our Loan and Security Agreement, refinance all or part of our existing debt, sell assets, incur additional indebtedness or raise equity. Our ability to make scheduled payments on our debt and other financial obligations depends on our financial and operating performance. Our financial and operating performance will continue to be subject to prevailing economic conditions and to financial, business and other factors, some of which are beyond our control.

Our existing indebtedness could adversely affect our ability to fulfill our obligations and may place us at a competitive disadvantage in our industry.

We continue to have substantial debt outstanding and we may incur additional indebtedness from time to time to finance working capital, product development efforts, strategic acquisitions, investments and alliances, capital expenditures or other general corporate purposes, subject to the restrictions contained in our existing indebtedness and in any other agreements under which we incur indebtedness. Our outstanding indebtedness and debt service requirements could adversely affect our ability to operate our business and may limit our ability to take advantage of potential business opportunities. For example, our existing level of indebtedness presents the following risks:

- we will be required to use a substantial portion of our cash flow from operations to pay principal and interest on our indebtedness, thereby reducing the availability of our cash flow to fund working capital, capital expenditures, product development efforts, acquisitions, investments and strategic alliances and other general corporate requirements;
- our debt service obligations could limit our flexibility in planning for, or reacting to, changes in our business and our industry and could limit our ability to pursue other business opportunities, borrow more money for operations or capital in the future and implement our business strategies;
- our level of indebtedness and the covenants within our debt instruments may restrict us from raising additional financing on satisfactory terms to fund working capital, capital expenditures, product development efforts, strategic acquisitions, investments and alliances, and other general corporate requirements; and
- our outstanding indebtedness may make it difficult for us to attract additional financing when needed.

If we are at any time unable to generate sufficient cash flow from operations to service our indebtedness when payment is due, we may be required to attempt to renegotiate the terms of the instruments relating to the indebtedness, seek to refinance all or a portion of the indebtedness or obtain additional financing. There can be no assurance that we will be able to successfully renegotiate such terms, that any such refinancing would be possible or that any additional financing could be obtained on terms that are favorable or acceptable to us.

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 strategic transactions; and
- Working capital requirements related to growing existing business.

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Even if we sell the full \$3,500,000 of common stock pursuant to the Sales Agreement as contemplated in this prospectus supplement, we will likely need to raise additional funds through debt or equity offerings in order to satisfy our capital needs.

We may need additional capital to finance our growth or to compete, which may cause dilution to existing stockholders or limit our flexibility in conducting our business activities.

We may need to raise additional capital in the future to fund expansion, respond to competitive pressures or acquire complementary businesses, technologies or services. Such additional financing may not be available on terms acceptable to us or at all. To the extent that we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution, and to the extent we engage in additional debt financing, if available, we may become subject to additional restrictive covenants that could limit our flexibility in conducting future business activities. If additional financing is not available or not available on acceptable terms, we may not be able to continue as a going concern, fund our expansion, promote our brands, take advantage of acquisition opportunities, develop or enhance services or respond to competitive pressures.

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 certain 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 laws or regulations, may have a material adverse impact on our business.

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 recently resulted in significant unemployment and slower growth in economic activity. A 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. The strengthening dollar has the potential to adversely impact U.S. businesses that operate overseas.

Sales have been variable.

Our laboratory performs 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 due to the fact that ICP is a new product and will enable the liquid biopsy market to evolve rapidly and ensure Precision Medicine is adopted globally. We see the ICP business and revenues growing as our commercial strategy is successful and our partnerships and licensing agreements become profitable.

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

Testing services are billed to physicians, patients, government payers such as Medicare, and insurance companies. Tests may be billed to different payers depending on a particular patient's medical insurance coverage. Government payers have increased their efforts to control the cost, utilization and delivery of health care services as well as reimbursement for laboratory testing services. Further reductions of reimbursement for Medicare and Medicaid services or changes in policy regarding coverage of tests or other requirements for payment, such as prior authorization or a physician or qualified practitioner's signature on test requisitions, may be implemented from time to time. Reimbursement for the laboratory services component of our business is also subject to statutory and regulatory reduction. Reductions in the reimbursement rates and changes in payment policies of other third party payers may occur as well. Such changes in the past have resulted in reduced payments as well as added costs and have decreased test utilization for the clinical laboratory industry by adding more complex new regulatory and administrative requirements. As a result, increases in the percentage of services billed to government payers could have an adverse impact on our net sales.

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

We may experience delays in processing biological samples caused by software and other errors. Any delay in processing samples could have an adverse effect on our business, financial condition and results of operations.

Our laboratories require ongoing CLIA certification.

The 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. The 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.

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The sanctions for failure to comply with the 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, or 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 Patient Testing 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 President Obama in March 2010 could adversely impact our business. While certain portions of the legislation have already gone into effect, the ultimate impact of the legislation on the health care industry is still unknown, and the overall impact on our business is likely to be extensive and could result in significant changes to our business and our customers' businesses.

We are subject to a number of claims of various amounts that arise out of the normal course of our business.

We are subject to a number of claims of various amounts that arise out of the normal course of our business. Specifically, on February 25, 2016, the Board of Regents of the University of Nebraska, or UNMC, filed a lawsuit against us in the District Court of Douglas County, Nebraska for breach of contract and seeking recovery of \$0.7 million owed by us to UNMC. We and UNMC are currently in discussions to determine a mutually agreeable means

by which to settle the outstanding liability. A \$0.7 million liability has been recorded and is reflected in accrued expenses at December 31, 2015 and March 31, 2016. In addition, on April 13, 2016, Fox Chase Cancer Center, or Fox Chase, filed a lawsuit against us in the Court of Common Pleas of Philadelphia County, First Judicial District of Pennsylvania Civil Trial Division alleging, among other things, breach of contract, tortious interference with present and prospective contractual relations, unjust enrichment and fraudulent conversion, conspiracy and seeking punitive damages in addition to damages and other relief. This lawsuit relates to a license agreement we entered into with Fox Chase in August 2000, as amended, or the License Agreement, as well as the assignment of certain of our rights under the License Agreement to Integrated DNA Technologies, Inc., or IDT, pursuant to the Surveyor Kit Patent, Technology and Inventory Purchase Agreement we entered into with IDT effective as of July 1, 2014, or the IDT Agreement. Pursuant to the terms of the IDT Agreement, we agreed to indemnify IDT with respect to certain of the claims asserted in the Fox Chase proceeding. We believe that we have good and substantial defenses to the claims asserted by Fox Chase. Furthermore, there is no guarantee that we will prevail in this suit or receive any damages or other relief if we do prevail.

Our ongoing and future litigation could result in significant additional costs and further divert the attention of our management and key personnel from our business operations and the implementation of our business strategy. In addition, the disposition of any of the pending claims against us, in excess of recorded accruals, could have a material adverse effect on our financial position, results of operations or cash flows.

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 our 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.

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 because our foreign sales are typically paid for in British Pounds or in Euros;

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 may limit our ability to sell products and services profitably in these markets; and

The fluctuation of foreign currency exchange rates to the U.S. 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 dependence on our suppliers exposes us to certain risks.

We rely on various suppliers for products and materials to produce our products. In the event that they would be unable to deliver these items due to product shortages or business closures, we may be unable to deliver our products to our customers in a timely manner or may need to increase our prices. The current economy poses the additional risk of our suppliers' inability 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 confidentiality provisions to protect some of our confidential and proprietary information that we are not seeking patent protection for various reasons. 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 technologies, 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 other efforts. Finally, some of the patent protections available to us in the U.S. are 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, our use of our technology could infringe patents or proprietary rights of others. This may lead others to assert patent infringement or other intellectual property claims against us. We could incur substantial costs in litigation if we are required to defend against intellectual property claims by third parties. Additionally, any licenses that we might need as a result of any actual infringement might not be available to us on commercially reasonable terms, if at all.

Our failure to comply with any applicable government laws and 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 be certain 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.

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 March 31, 2016, we had obligations to issue 12,970,881 shares of common stock upon exercise of outstanding stock options, warrants or conversion rights. The issuance of these securities may be dilutive to our current stockholders 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 March 31, 2016, we had 20,695,870 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 our stock in the market. In addition, the large concentration of our shares are held by a small group of stockholders which could result in increased volatility in our stock price due to the limited number of shares available in the market.

We have previously identified material weaknesses and ineffective internal controls could impact our business and financial results.

Our internal control over financial reporting may not prevent or detect misstatements because of its inherent limitations, including the possibility of human error, the circumvention or overriding of controls, or fraud. In the course of auditing our financial statements as of and for the year ended December 31, 2014, our independent registered public accounting firm identified material weaknesses in our internal control over financial reporting relating to proper timing and recognition of revenue and the elements used in our analysis and evaluation of the allowance for doubtful accounts to ensure that the allowance for doubtful accounts is reasonably stated. We remediated these material weaknesses in the year ended December 31, 2015.

Even effective internal controls can provide only reasonable assurance with respect to the preparation and fair presentation of financial statements. If we fail to maintain the adequacy of our internal controls, including any failure to implement required new or improved controls, or if we experience difficulties in their implementation, our business and financial results could be harmed, we could fail to meet our financial reporting obligations and we may not be able to accurately report financial results or prevent fraud.

If we cannot meet the continued listing requirements of The Nasdaq Stock Market LLC, or Nasdaq, Nasdaq may delist our shares of common stock, which would have an adverse impact on the trading volume, liquidity and market price of our common shares.

On February 23, 2016, we received written notice, or the Notice, from Nasdaq indicating that, based on the closing bid price of our common stock for the preceding 30 consecutive business days, we were not in compliance with the \$1.00 minimum bid price requirement for continued listing on the Nasdaq Capital Market, or the Minimum Bid Price Requirement, as set forth in Nasdaq Listing Rule 5550(a)(2). In accordance with Nasdaq Listing Rule 5810(c)(3)(A), we have a period of 180 calendar days, or until August 22, 2016, to regain compliance with the Minimum Bid Price Requirement. To regain compliance, the closing bid price of our common stock must meet or exceed \$1.00 per share for at least ten consecutive business days during this 180 calendar day period.

If we are not in compliance with the Minimum Bid Price Requirement by August 22, 2016, Nasdaq may provide us with a second 180 calendar day period to regain compliance. To qualify for the second 180 calendar day period, we would be required to (i) meet the continued listing requirement for the Nasdaq Capital Market for market value of publicly held shares and all other initial listing standards for the Nasdaq Capital Market, except for the Minimum Bid Price Requirement, and (ii) notify Nasdaq of our intent to cure our noncompliance with the Minimum Bid Price, including by effecting a reverse stock split, if necessary. If we do not indicate our intent to cure the deficiency or if it does not appear to Nasdaq that it would be possible for us to cure the deficiency, we would not be eligible for the second 180 calendar day period, and our common stock would then be subject to delisting from the Nasdaq Capital Market.

If we do not regain compliance within the allotted compliance period(s), including any extensions that may be granted by Nasdaq, Nasdaq will provide notice that our common stock will be subject to delisting. We would then be entitled to appeal the Nasdaq Staff's determination to a Nasdaq Listing Qualifications Panel and request a hearing.

On April 20, 2016, we received a second written notice, or the Second Notice, from Nasdaq indicating that, based on the stockholders' equity reported in our Annual Report on Form 10-K, as filed with the SEC on April 14, 2016, we are not in compliance with the minimum stockholders' equity requirement for continued listing on the Nasdaq Capital Market, which requires listed companies to maintain stockholders' equity of at least \$2,500,000, or the Minimum Stockholders' Equity Requirement, as set forth in Nasdaq Listing Rule 5550(b)(1). In accordance with Nasdaq Listing Rule 5810(c)(2)(C), we have a period of 45 calendar days, or until June 6, 2016, to submit a plan to regain compliance with the Minimum Stockholders' Equity Requirement. If our plan is accepted, Nasdaq may grant an extension of up to 180 calendar days, or until October 17, 2016, to evidence compliance. If our plan is not accepted, we will have the opportunity to appeal the Nasdaq Staff's determination to a Hearings Panel.

Neither the First Notice nor the Second Notice has an immediate effect on the listing of our common stock, and our common stock will continue to trade on the Nasdaq Capital Market under the symbol "TBIO" at this time. We intend to monitor the closing bid price of our common stock and consider our available options to resolve our noncompliance with the Minimum Bid Price Requirement and the Minimum Stockholders' Equity Requirement. No determination regarding our response to the Notice has been made at this time. There can be no assurance that we will be able to regain compliance with the Minimum Bid Price Requirement or the Minimum Stockholders' Equity Requirement or will otherwise be in compliance with the other listing standards for the Nasdaq Capital Market. A suspension or delisting of our common stock could adversely affect our relationships with our business partners and suppliers and customers' and potential customers' decisions to purchase our products and services, and could have a material, adverse impact on our business and operating results. In addition, a suspension or delisting could impair our ability to raise additional capital through equity or debt financings and our ability to attract and retain employees by means of equity compensation.

In the event of a delisting or suspension, our common stock could begin trading on the over-the-counter bulletin board, or in the so-called "pink sheets." In the event of such trading, it is likely that there would be significantly less

liquidity in the trading of our common stock; decreases in institutional and other investor demand for our common stock, coverage by securities analysts, market making activity and information available concerning trading prices and volume; and fewer broker-dealers willing to execute trades in our common stock. The occurrence of any of these events could result in a further decline in the market price of our common stock and could have a material adverse effect on us.

Risks Related to this Offering

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

The offering price per share in this offering may exceed the net tangible book value per share of our common stock outstanding prior to this offering. Assuming that an aggregate of 5,833,333 shares of our common stock are sold during the term of the sales agreement with Craig-Hallum at a price of \$0.60 per share, the last reported sale price of our common stock on the Nasdaq Capital Market on June 6, 2016, for aggregate gross proceeds of \$3,500,000, after deducting commissions and estimated aggregate offering expenses payable by us, you will experience immediate dilution of \$1.11 per share, representing the difference between our net tangible book value per share as of March 31, 2016 after giving effect to this offering and the assumed offering price. The exercise of outstanding stock options and warrants may result in further dilution of your investment. For a further description of the dilution that you will experience immediately after this offering, see the section in this prospectus supplement entitled "Dilution."

The actual number of shares we will issue under the Sales Agreement, at any one time or in total, is uncertain.

Subject to certain limitations in the Sales Agreement and compliance with applicable law, we have the discretion to deliver sales notices to Craig-Hallum at any time throughout the term of the Sales Agreement. The number of shares that are sold by Craig-Hallum after delivering a sales notice will fluctuate based on the market price of the common stock during the sales period and limits we set with Craig-Hallum. Because the price per share of each share sold will fluctuate based on the market price of our common stock during the sales period, it is not possible at this stage to predict the number of shares that will ultimately be issued.

The market price of our common stock may be volatile and could decline substantially.

The market price of our common stock has been subject to wide fluctuations. From January 1, 2015 to June 6, 2016, the closing price of our common stock ranged from a low of \$0.50 on May 6, 2016 to a high of \$3.90 on January 29, 2015. The market price of our common stock in the future is likely to continue to be subject to wide fluctuations in response to various factors, including, but not limited to, the following:

variations in our operating results and financial conditions;
actual or anticipated announcements of technical innovations, new product developments, or design wins by us or our competitors;
general conditions in our industry; and
worldwide economic and financial conditions.

In addition, the public stock markets have experienced extreme price and volume fluctuations that have particularly affected the market price for many technology companies and that have often been unrelated to the operating performance of these companies. The broad market fluctuations and other factors may continue to adversely affect the market price of our common stock.

Because we do not intend to pay dividends for the foreseeable future, stockholders will benefit from an investment in our common stock only if it appreciates in value.

We have never paid any cash dividends on our common stock and do not expect to declare cash dividends on the common stock in the foreseeable future. As a result, the success of an investment in our common stock will depend entirely upon any future appreciation. There is no guarantee that our common stock will appreciate in value or even maintain the price at which shareholders have purchased their shares.

We have broad discretion to determine how to use the funds raised in this offering, and may use them in ways that may not enhance our operating results or the price of our common stock.

Our management will have broad discretion over the use of proceeds from this offering, and we could spend the proceeds from this offering in ways our stockholders may not agree with or that do not yield a favorable return, if at all. We intend to use the net proceeds of this offering for working capital and general corporate purposes, which may include, without limitation, supporting asset growth and engaging in acquisitions or other business combinations. We also may use a portion of the proceeds to repay debt. However, our use of these proceeds may differ substantially from

our current plans. If we do not invest or apply the proceeds of this offering in ways that improve our operating results, we may fail to achieve expected financial results, which could cause our stock price to decline.

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DISCLOSURE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus and the documents incorporated by reference in this prospectus supplement and the accompanying prospectus contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, that involve substantial risks and uncertainties. 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. All statements, other than statements of historical facts, included in this prospectus supplement, the accompanying prospectus or any document incorporated by reference in this prospectus supplement and the accompanying prospectus regarding our strategy, future operations, future financial position, future revenues, projected costs, prospects and plans and objectives of management are forward-looking statements. In some cases these statements are identifiable through the use of words such as “anticipate,” “believe,” “estimate,” “expect,” “intend,” “plan,” “project,” “target,” “can,” “could,” “may,” “should,” “will,” “would” or the negative of other similar expressions.

These statements are based on management’s current views, assumptions or beliefs of future events and financial performance and are subject to uncertainty and changes in circumstances. Readers of this prospectus supplement and the accompanying prospectus should understand that these statements are not guarantees of performance or results and you are cautioned not to place undue reliance on these forward-looking statements. Many factors could affect our actual financial results and cause them to vary materially from the expectations contained in the forward-looking statements. These factors include, among other things: our expected revenue, income (loss), receivables, operating expenses, supplier pricing, availability and prices of raw materials, Medicare/Medicaid/Insurance reimbursements, product pricing, the timing for introduction of new products, foreign currency exchange rates, sources of funding operations and acquisitions, our ability to raise funds, sufficiency of available liquidity, future interest costs, future economic circumstances, business strategy, industry conditions and key trends, our ability to execute our operating plans, the success of our cost savings initiatives, competitive environment and related market conditions, expected financial and other benefits from our organizational restructuring activities, actions of governments and regulatory factors affecting our business and other risks as described in our reports filed with the SEC.

You should assume that the information appearing in this prospectus, any accompanying prospectus supplement, any related free writing prospectus and any document incorporated herein by reference is accurate as of its date only. 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.

We expressly disclaim any obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

USE OF PROCEEDS

We currently intend to use the net proceeds from this offering for working capital and general corporate purposes, which may include, without limitation, supporting asset growth and engaging in acquisitions or other business combinations. We also may use a portion of the proceeds to repay debt.

The amounts and timing of our use of the net proceeds from this offering will depend on a number of factors, such as the timing and progress of our research and development efforts, the timing and progress of any partnering and commercialization efforts, technological advances and the competitive environment for our products. As of the date of this prospectus supplement, we cannot specify with certainty all of the particular uses for the net proceeds to us from this offering. Accordingly, our management will have broad discretion in the timing and application of these proceeds. Pending application of the net proceeds as described above, we intend to temporarily invest the proceeds in short-term, interest-bearing instruments. We reserve the right, at the sole discretion of our Board of Directors, to reallocate the proceeds of this offering in response to developments in our business and any other factors.

DILUTION

If you invest in this offering, your ownership interest will be diluted to the extent of the difference between the public offering price per share and the as adjusted net tangible book value per share of our common stock after giving effect to this offering.

Our net tangible book value as of March 31, 2016 was a deficit of \$16,556,000, or (\$0.80) per share of common stock. Our net tangible book value per share represents total tangible assets less total liabilities, divided by the number of shares of common stock outstanding at March 31, 2016.

After giving effect to the assumed sale of shares of our common stock in the aggregate amount of \$3,500,000 at an assumed offering price of \$0.60 per share, the last reported sale price of our common stock on June 6, 2016, and after deduction of commissions and estimated offering expenses payable by us, our as adjusted net tangible book value as of March 31, 2016 would have been a deficit of approximately \$13,470,000, or (\$0.51) per share of common stock. This amount represents an immediate increase in as adjusted net tangible book value of \$0.29 per share to our existing stockholders and an immediate dilution in the as adjusted net tangible book value of approximately \$1.11 per share to investors participating in this offering at an assumed offering price of \$0.60 per share.

Dilution per share to new investors is determined by subtracting the as adjusted net tangible book value per share after this offering from the public offering price per share paid by purchasers in this offering. The following table illustrates this dilution on a per share basis:

Assumed offering price per share	\$0.60
Net tangible book value per share as of March 31, 2016	\$(0.80)
Increase in as adjusted net tangible book value per share attributable to this offering	0.29
As adjusted net tangible book value per share after this offering	\$(0.51)
Dilution per share to new investors participating in this offering	\$1.11

The table above assumes for illustrative purposes that an aggregate of 5,833,333 shares of our common stock are sold during the term of the Sales Agreement with Craig-Hallum at a price of \$0.60 per share, the last reported sale price of our common stock on the Nasdaq Capital Market on June 6, 2016, for aggregate gross proceeds of \$3,500,000. Pursuant to the Sales Agreement with Craig-Hallum, the shares are being sold from time to time at various prices. An increase of \$0.50 per share in the price at which the shares are sold from the assumed offering price of \$0.60 per share shown in the table above, assuming all of our common stock in the aggregate amount of \$3,500,000 during the term of the sales agreement with Craig-Hallum is sold at that price, would increase our pro forma net tangible book value per share after the offering to (\$0.40) per share and would decrease the dilution in net tangible book value per share to

new investors in this offering to \$1.00 per share, after deducting commissions and estimated aggregate offering expenses payable by us. A decrease of \$0.50 per share in the price at which the shares are sold from the assumed offering price of \$0.60 per share shown in the table above, assuming all of our common stock in the aggregate amount of \$3,500,000 during the term of the Sales Agreement with Craig-Hallum is sold at that price, would decrease our pro forma net tangible book value per share after the offering to (\$0.61) per share and would increase the dilution in net tangible book value per share to new investors in this offering to \$1.21 per share, after deducting commissions and estimated aggregate offering expenses payable by us. This information is supplied for illustrative purposes only.

The amounts above are based on 20,695,870 shares of common stock outstanding as of March 31, 2016 and do not take into account, as of March 31, 2016:

· 1,121,794 shares of our common stock issuable upon exercise of outstanding stock options to purchase shares of our common stock at a weighted average exercise price of \$3.42 per share;

· 98,333 shares of our common stock issuable upon exercise of outstanding stock appreciation rights with a weighted average exercise price of \$4.14 per share;

· 371,275 shares of our common stock reserved for issuance under our 2006 Equity Incentive Plan, as amended;

· 2,365,243 shares of our Series A-1 Convertible Preferred Stock, which is convertible into shares of our common stock at a rate of 1-for-1, subject to certain adjustments;

· 8,853,905 shares of our common stock issuable in connection with our outstanding warrants with a weighted average exercise price of \$3.10 per share; and

· shares of our common stock issuable upon conversion of our unsecured outstanding convertible promissory notes in the aggregate principal amount of \$571,250.

PLAN OF DISTRIBUTION

We have entered into a sales agreement, dated June 7, 2016, with Craig-Hallum, that provides for the issuance and sale by us of shares of our common stock having an aggregate offering price of up to \$3,500,000 from time to time through Craig-Hallum acting as agent. This prospectus supplement relates to the offer and sale of such shares of common stock under such Sales Agreement under the registration statement of which this prospectus supplement forms a part.

Upon instructions from us, Craig-Hallum will use its commercially reasonable efforts, consistent with its normal sales and trading practices and applicable law, to sell shares of our common stock under the Sales Agreement pursuant to this prospectus supplement. Sales of the shares of common stock, if any, pursuant to this prospectus supplement will be made in an “at the market offering” as defined in Rule 415 under the Securities Act. Specifically, sales will be made directly on the Nasdaq Capital Market, the existing trading market for the common stock, or on any other existing trading market for our common stock, at market prices prevailing at the time of sale. In the event any sales are made pursuant to the Sales Agreement which are not made directly on the Nasdaq Capital Market or on any other existing trading market for our common stock at market prices at the time of sale, including, without limitation, any sales to the sales agent acting as principal or sales in privately negotiated transactions, we will file a prospectus supplement describing the terms of such transaction, the amount of shares sold, the price thereof, the applicable compensation, and such other information as may be required pursuant to Rule 424 and Rule 430B under the Securities Act, as applicable, within the time required by Rule 424 under the Securities Act. To the extent required by Regulation M, Craig-Hallum will not engage in any transactions that stabilize our common stock while the offering is ongoing under this prospectus supplement.

Under the Sales Agreement between us and Craig-Hallum, we will instruct Craig-Hallum in a sales notice as to the maximum amount of shares of our common stock to be sold by Craig-Hallum daily, and the minimum price per share at which such shares may be sold. Subject to the conditions of the Sales Agreement, Craig-Hallum will use its commercially reasonable efforts to solicit purchases on a particular day of all shares designated for sale by us on that day. The gross sales price of the shares sold will be the market price for shares of our common stock sold by Craig-Hallum on the trading market at the time of sale of the shares. We or Craig-Hallum may suspend the offering of our common stock upon proper notice and subject to certain other conditions. The obligation of Craig-Hallum under the Sales Agreement to sell our common stock pursuant to a sales notice is subject to a number of customary conditions.

Craig-Hallum will provide written confirmation to us following the close of trading on the Nasdaq Capital Market following each day in which shares of our common stock are sold under the Sales Agreement. Each confirmation will include the number of shares sold on the day, the aggregate gross sales proceeds, the net proceeds to us and the compensation payable by us to Craig-Hallum with respect to the sales.

We will pay Craig-Hallum commissions for its services in acting as our agent in the sale of our common stock. The compensation payable to Craig-Hallum for sales of shares of our common stock with respect to which Craig-Hallum acts as sales agent shall be equal to 3.25% of the gross sales price of those shares. There is no guarantee that there will be any sales of our common stock under this prospectus supplement and the accompanying base prospectus and actual sales, if any, of our common stock under this prospectus supplement and the accompanying base prospectus may result in gross proceeds to us of less than \$3,500,000, exclusive of any sales agent compensation or other offering fees and expenses.

Settlement for sales of shares of our common stock will occur on the third business day following the date on which any sales are made. There is no arrangement for funds to be received in an escrow, trust or similar arrangement.

In connection with the sale of shares of our common stock on our behalf, Craig-Hallum may be deemed to be an “underwriter” within the meaning of the Securities Act, and the compensation of Craig-Hallum may be deemed to be underwriting commissions or discounts. We have also agreed to reimburse Craig-Hallum for certain specified expenses, including the fees and disbursements of its legal counsel in an amount of \$55,000, a \$25,000 non-accountable expense allowance for Craig-Hallum’s due diligence fees and out-of-pocket due diligence fees not to exceed \$5,000 per calendar quarter. We have agreed to provide indemnification and contribution to Craig-Hallum with respect to certain civil liabilities, including liabilities under the Securities Act and the Exchange Act.

We estimate that the total expenses of the offering payable by us, excluding commissions payable to Craig-Hallum under the Sales Agreement, will be approximately \$300,000.

The offering of shares of our common stock pursuant to the Sales Agreement will terminate upon the earlier of (1) the sale of all of our common stock provided for in this prospectus supplement, or (2) the termination of the Sales Agreement. The Sales Agreement may be terminated by us at any time in our sole discretion by giving fifteen business days’ written notice to Craig-Hallum, or by Craig-Hallum at any time in its sole discretion. The Sales Agreement will remain in full force and effect until the earlier of one year from the date thereof and such date that the Sales Agreement is terminated in accordance with the terms thereof.

This is a brief summary of the material provisions of the Sales Agreement and does not purport to be a complete statement of its terms and conditions. A copy of the Sales Agreement has been filed with the SEC on a Current Report on Form 8-K and is incorporated by reference into the registration statement of which this prospectus forms a part.

Craig-Hallum and its affiliates may in the future provide various investment banking and other financial services for us for which services they may in the future receive customary fees. The principal business address of Craig-Hallum is 222 South Ninth Street, Suite 350, Minneapolis, MN 55402.

LEGAL MATTERS

Certain legal matters relating to the issuance of the securities offered by this prospectus supplement will be passed upon for us by Paul Hastings LLP, Palo Alto, California. Craig-Hallum Capital Group LLC is being represented in connection with this offering by Ellenoff Grossman & Schole LLP, New York, New York.

EXPERTS

The consolidated balance sheets of Transgenomic, Inc. and Subsidiary (the “Company”) as of December 31, 2015 and 2014, and the related consolidated statements of operations, comprehensive loss, stockholders’ equity and cash flows for each of the two years in the period ended December 31, 2015 appearing in Transgenomic, Inc.’s Annual Report (Form 10-K) for the year ended December 31, 2015, have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their report thereon (which contains an explanatory paragraph that raises substantial doubt about the Company’s ability to continue as a going concern as described in Note 1 to the consolidated financial statements), included therein, and incorporated herein by reference. Such financial statements are incorporated herein in reliance upon such reports given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We are subject to the information reporting requirements of the Exchange Act, and we file annual, quarterly and special reports, proxy statements and other information with the SEC relating to our business, financial results and other matters. The reports, proxy statements and other information we file may be inspected and copied at prescribed rates at the SEC’s Public Reference Room and via the SEC’s website (see below for more information).

This prospectus supplement and the accompanying prospectus are part of a registration statement on Form S-3 that we filed under the Securities Act with the SEC. This prospectus supplement and the accompanying prospectus do not contain all of the information included in that registration statement and its accompanying exhibits and schedules. For further information with respect to our securities and us, you should refer to that registration statement and its accompanying exhibits and schedules. Statements in this prospectus supplement and the accompanying prospectus concerning any document that we filed as an exhibit to the registration statement or that we otherwise filed with the SEC are not intended to be comprehensive and are qualified by reference to these filings. You should review the complete document to evaluate these statements.

You may inspect a copy of the registration statement of which this prospectus supplement is a part and its accompanying exhibits and schedules, as well as the reports, proxy statements and other information we file with the SEC, without charge at the SEC's Public Reference Room, 100 F Street, N.E., Room 1580, Washington, D.C. 20549, and you may obtain copies of all or any part of the registration statement from those offices for a fee. You may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The SEC maintains a web site that contains reports, proxy and information statements and other information regarding registrants that file electronically, including us. The address of the site is www.sec.gov.

INFORMATION INCORPORATED BY REFERENCE

The SEC allows us to “incorporate by reference” information into this prospectus, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The documents incorporated by reference into this prospectus contain important information that you should read about us.

The following documents are incorporated by reference into this prospectus:

- (a) The Registrant’s Annual Report on Form 10-K for the fiscal year ended December 31, 2015, filed with the SEC on April 14, 2016;
- (b) The Registrant’s Quarterly Report on Form 10-Q for the quarter ended March 31, 2016, filed with the SEC on May 23, 2016;
- (c) The Registrant’s Definitive Proxy Statement on Schedule 14A filed with the SEC on April 29, 2016;
- (d) The Registrant’s Current Reports on Form 8-K filed with the SEC on (i) January 11, 2016, filed at 7:30 a.m. Eastern Time, (ii) January 11, 2016, filed at 7:33 a.m. Eastern Time, (iii) January 20, 2016, (iv) February 26, 2016, (v) March 14, 2016, and (vi) April 26, 2016; and
- (e) The description of the Registrant’s common stock set forth in the Registrant’s Registration Statement on Form 8-A (File No. 001-36439), filed with the SEC on May 5, 2014, including any amendments or reports filed for the purpose of updating such description.

We also incorporate by reference any future filings (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items unless such Form 8-K expressly provides to the contrary) made with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made after the date of the initial filing of the registration statement of which this prospectus is a part and prior to effectiveness of such registration statement, until we file a post-effective amendment that indicates the termination of the offering of the securities made by this prospectus and will become a part of this prospectus from the respective dates that such documents are filed with the SEC. Any statement contained herein or in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes hereof or of the related prospectus supplement to the extent that a statement contained herein or in any other subsequently filed document which is also incorporated or deemed to be incorporated herein modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

Documents incorporated by reference are available from us, without charge. You may obtain documents incorporated by reference in this prospectus by requesting them in writing or by telephone at the following address:

Transgenomic, Inc.

Attn: Investor Relations

12325 Emmet Street

Omaha, Nebraska 68164

Phone: (402) 452-5400

Fax: (402) 452-5461

E-mail: investorrelations@transgenomic.com

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PROSPECTUS

Transgenomic, Inc.

\$50,000,000

Common Stock

Preferred Stock

Debt Securities

Warrants

Units

We may offer and sell up to \$50,000,000 in the aggregate of any combination of the securities identified above from time to time in one or more offerings, either individually or in combination with other securities. We may also offer common stock or preferred stock upon conversion of debt securities, common stock upon conversion of preferred stock, or common stock, preferred stock or debt securities upon the exercise of warrants.

Each time we offer and sell securities, we will provide a supplement to this prospectus that contains specific information about the offering and the amounts, prices and terms of the securities. We may also authorize one or more free writing prospectuses to be provided to you in connection with these offerings. The prospectus supplement and any related free writing prospectuses may also add, update or change information contained in this prospectus with respect to that offering. You should carefully read this prospectus and the applicable prospectus supplement and any related free writing prospectus, as well as any documents incorporated by reference, before you invest in any of our securities.

We may offer and sell the securities described in this prospectus and any prospectus supplement to or through one or more underwriters, dealers and agents, or directly to purchasers, or through a combination of these methods. If any underwriters, dealers or agents are involved in the sale of any of the securities, their names and any applicable purchase price, fee, commission or discount arrangement between or among them will be set forth, or will be calculable from the information set forth, in the applicable prospectus supplement. See the sections of this prospectus entitled "About this Prospectus" and "Plan of Distribution" for more information. No securities may be sold without delivery of this prospectus and the applicable prospectus supplement describing the method and terms of the offering of such securities.

Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading “Risk Factors” on page 2 of this prospectus, any applicable prospectus supplement and in any applicable free writing prospectuses, and under similar headings in the documents that are incorporated by reference into this prospectus.

Our common stock is currently listed on the NASDAQ Capital Market under the symbol “TBIO”. On February 3, 2015, the last reported sales price for our common stock was \$3.32 per share. The applicable prospectus supplement will contain information, where applicable, as to any other listing on the NASDAQ Capital Market or any securities market or other exchange of the securities, if any, covered by the applicable prospectus supplement.

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

The date of this prospectus is February 13, 2015.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or the SEC, utilizing a “shelf” registration process. Under this shelf registration process, we may offer and sell shares of our common stock and preferred stock, various series of debt securities, warrants to purchase any of such securities and/or units consisting of any combination of such securities, either individually or in combination with other securities, in one or more offerings, up to a total dollar amount of \$50,000,000. This prospectus provides you with a general description of the securities we may offer.

Each time we offer securities under this prospectus, we will provide a prospectus supplement that will contain more specific information about the terms of that offering. We may also authorize one or more free writing prospectuses to be provided to you that may contain material information relating to these offerings. The prospectus supplement and any related free writing prospectus we have authorized for use in connection with a specific offering may also add, update or change any of the information contained in this prospectus or in the documents that we have incorporated by reference into this prospectus. We urge you to read carefully this prospectus, any applicable prospectus supplement and any free writing prospectuses we have authorized for use in connection with a specific offering, together with the information incorporated herein by reference as described under the section entitled “Important Information Incorporated by Reference”, before buying any of the securities being offered.

You should rely only on the information contained in, or incorporated by reference into, this prospectus and any applicable prospectus supplement, along with the information contained in any free writing prospectuses we have authorized for use in connection with a specific offering. We have not authorized anyone to provide you with different or additional information. This prospectus is an offer to sell only the securities offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so.

The information appearing in this prospectus, any applicable prospectus supplement or any related free writing prospectus is accurate only as of the date on the front of the document and any information we have incorporated by reference is accurate only as of the date of the document incorporated by reference, regardless of the time of delivery of this prospectus, any applicable prospectus supplement or any related free writing prospectus, or any sale of a security. Our business, financial condition, results of operations and prospects may have changed since those dates.

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

PROSPECTUS SUMMARY

This summary highlights selected information contained elsewhere in this prospectus or incorporated by reference in this prospectus, and does not contain all of the information that you need to consider in making your investment decision. You should carefully read the entire prospectus, any applicable prospectus supplement and any related free writing prospectus, including the risks of investing in our securities discussed under the heading “Risk Factors” contained in any applicable prospectus supplement and any related free writing prospectus, and under similar headings in the other documents that are incorporated by reference into this prospectus. You should also carefully read the information incorporated by reference into this prospectus, including our financial statements, and the exhibits to the registration statement of which this prospectus is a part. Unless otherwise mentioned or unless the context requires otherwise, all references in this prospectus to “Transgenomic”, “the Company”, “we”, “us”, “our” or similar references mean Transgenomic, Inc. together with its consolidated subsidiary.

Transgenomic, Inc.

We are a global biotechnology company advancing personalized medicine in the detection and treatment of cancer and inherited diseases through our proprietary molecular technologies and clinical and research services. We have two complementary business segments:

Laboratory Services. Our laboratories specialize in genetic testing for cardiology, neurology, mitochondrial disorders and oncology. Our Patient Testing laboratories located in New Haven, Connecticut and Omaha, Nebraska are certified under the Clinical Laboratory Improvement Amendment as high complexity labs and our Omaha facility is also accredited by the College of American Pathologists. Our Biomarker Identification laboratory located in Omaha, Nebraska also provides pharmacogenomics research services supporting Phase II and Phase III clinical trials conducted by pharmaceutical companies. Our laboratories employ a variety of genomic testing service technologies, including ICE COLD-PCR technology. ICE COLD-PCR is a proprietary platform technology that can be run in any laboratory with standard PCR technology and that enables detection of multiple unknown mutations from virtually any sample type, including tissue biopsies, blood, cell-free DNA and circulating tumor cells at levels greater than 1,000-fold higher than standard DNA sequencing techniques.

Genetic Assays and Platforms. 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, or 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 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, or the SEC, that are incorporated by reference in this prospectus, including our Annual Report on Form 10-K for the year ended December 31, 2013. For instructions on how to find copies of these documents, see “Where You Can Find More 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 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.

RISK FACTORS

Investing in any securities offered pursuant to this prospectus and the applicable prospectus supplement involves a high degree of risk. Before making an investment decision, you should carefully consider the risks described under “Risk Factors” in any 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 or incorporated by reference into this prospectus and any applicable prospectus supplement, before deciding whether to purchase any of the securities being offered. Our business, financial condition or results of operations could be materially adversely affected by any of these risks. The occurrence of any of these risks might cause you to lose all or part of your investment in the offered securities.

DISCLOSURE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference into this prospectus may contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, 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 Part I - Item 1A, “Risk Factors”, in our Annual Report on Form 10-K for the year ended December 31, 2013, as filed with the SEC on March 27, 2014, and elsewhere in the documents incorporated by reference into this prospectus.

You should assume that the information appearing in this prospectus, any accompanying prospectus supplement, any related free writing prospectus and any document incorporated herein by reference is accurate as of its date only. Because the risk factors referred to above could cause actual results or outcomes to differ materially from those expressed in any forward-looking statements made by us or on our behalf, you should not place undue reliance on any forward-looking statements. 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.

USE OF PROCEEDS

Except as described in any applicable prospectus supplement or in any free writing prospectuses we have authorized for use in connection with a specific offering, we currently intend to use the net proceeds from this offering, if any, for working capital and general corporate purposes, which may include, without limitation, supporting asset growth and engaging in acquisitions or other business combinations. We also may use a portion of the proceeds to repay debt.

The amounts and timing of our use of the net proceeds from this offering will depend on a number of factors, such as the timing and progress of our research and development efforts, the timing and progress of any partnering and commercialization efforts, technological advances and the competitive environment for our products. As of the date of this prospectus, we cannot specify with certainty all of the particular uses for the net proceeds to us from this offering. Accordingly, our management will have broad discretion in the timing and application of these proceeds. Pending application of the net proceeds as described above, we intend to temporarily invest the proceeds in short-term, interest-bearing instruments.

RATIO OF EARNINGS TO FIXED CHARGES AND PREFERRED SHARE DIVIDENDS

The following table sets forth the historical ratios of earnings to fixed charges and preferred share dividends for Transgenomic and its subsidiary for the periods indicated.

	Year Ended December 31,					Nine Months Ended September 30, 2014
	2009	2010	2011	2012	2013	
Ratio of earnings (loss) to fixed charges(1)	-	-	-	-	-	-
Ratio of earnings (loss) to combined fixed charges and preferred share dividends(2)	-	-	-	-	-	-

(1) We did not record earnings for any of the years ended December 31, 2009, 2010, 2011, 2012 or 2013 or the nine months ended September 30, 2014. Accordingly, our earnings were insufficient to cover fixed charges for such periods and we are unable to disclose a ratio of earnings to fixed charges for such periods. The dollar amount of the deficiency in earnings available for fixed charges for the years ended December 31, 2009, 2010, 2011, 2012 and 2013 and the nine months ended September 30, 2014 was approximately \$1.878 million, \$2.984 million, \$9.737 million, \$8.181 million, \$16.041 million and \$7.678 million.

(2) We did not record earnings for any of the years ended December 31, 2009, 2010, 2011, 2012 or 2013 or the nine months ended September 30, 2014. Accordingly, our earnings were insufficient to cover combined fixed charges and preference dividends for such periods and we are unable to disclose a ratio of earnings to combined fixed charges and preference dividends for such periods. The dollar amount of the deficiency in earnings available for combined fixed charges and preference dividends for the years ended December 31, 2009, 2010, 2011, 2012 and 2013 and the nine months ended September 30, 2014 was approximately \$1.878 million, \$2.984 million, \$10.747 million, \$8.841 million, \$16.767 million and \$8.517 million.

DESCRIPTION OF CAPITAL STOCK**General Matters**

Under our Third Amended and Restated Certificate of Incorporation, as amended from time to time, or the Certificate of Incorporation, we are authorized to issue up to 150,000,000 shares of common stock, \$0.01 par value per share, or the Common Stock, from time to time, as provided in a resolution or resolutions adopted by our Board of Directors.

Common Stock

As of January 31, 2015, 8,283,179 shares of Common Stock were issued and outstanding, held by approximately 82 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 stockholders 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 the 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 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, or the "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 the 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.

Of the number of shares of Preferred Stock authorized by our Certificate of Incorporation, as of January 31, 2015 (i) 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 Amendment of Certificate of Designation of Series A Convertible Preferred Stock filed with the Secretary of State of the State of Delaware on March 5, 2014, or the Series A Certificate of Designation, and (ii) 1,443,297 shares had been designated Series B Convertible Preferred Stock with such rights, privileges and preferences as set forth in the Certificate of Designation of Series B Convertible Preferred Stock filed with the Secretary of State of the State of Delaware on March 5, 2014, or the Series B Certificate of Designation. As of January 31, 2015, 2,586,205 shares of the Series A Convertible Preferred Stock, or the Series A Preferred, were issued and outstanding, and 1,443,297 shares of the Series B Convertible Preferred Stock, or the Series B Preferred, were issued and outstanding. The Series A Preferred and the Series B Preferred are sometimes referred to in this prospectus, together, as the Preferred Shares.

Dividends, Voting Rights and Liquidation

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

Certain rights of the holders of the Series B Preferred are senior to the rights of the holders of the Series A Preferred and to the rights of the holders of our Common Stock. The Series B Preferred has a liquidation preference equal to its original price per share, plus any accrued and unpaid dividends thereon. The Series B Preferred accrues cumulative dividends at the rate of 6.0% of the original price per share per annum. Additionally, the Series B Certificate of Designation also contains an optional redemption provision whereby the holders of a majority of the then issued and outstanding Series B Preferred, voting together as a separate class, may, after March 5, 2019, the fifth anniversary of the closing of the private placement in which the shares of Series B Preferred were issued, require the Company to redeem all of the then issued and outstanding shares of Series B Preferred at the initial price per share of the Series B Preferred, as adjusted for any stock dividends, combinations or splits, plus all accrued but unpaid dividends.

Certain rights of the holders of the Series A Preferred are senior to the rights of the holders of our Common Stock. Subject to the liquidation preference of the Series B Preferred, the Series A Preferred has a liquidation preference equal to its original price per share, plus any accrued and unpaid dividends thereon. After the payment of dividends to the holders of Series B Preferred, 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 B Preferred will be automatically converted into Common Stock, at an initial conversion rate of 1:1, and 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 Preferred

Shares, voting together as a single class on an as-converted to Common Stock basis. The initial conversion rate for each of the Series A Preferred and the Series B Preferred is subject to adjustment in the event of certain stock splits, stock dividends, mergers, reorganizations and reclassifications. After giving effect to the 1-for-12 reverse split of the Common Stock effected in January 2014, the conversion rate for the Series A Preferred was adjusted to 1:3.

Generally, the holders of the Preferred Shares are entitled to vote together as a single group with the holders of Common Stock on an as-converted to Common Stock basis. However, each of the Series A Certificate of Designation and the Series B Certificate of Designation provides that we will not perform the following activities, subject to certain exceptions, without the affirmative vote of the holders of at least two-thirds of the outstanding Preferred Shares, voting together as a single class on an as-converted to Common Stock basis:

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

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

authorize or declare any dividends on the shares of Common Stock or any other shares of capital stock other than the Preferred Shares, other than dividends payable solely in shares of Common Stock;

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 of Directors;

enter into any binding agreement with any director, employee or any affiliate of the Company, excluding employment-related and equity award agreements;

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;

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, dissolve 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;

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 of Directors, including the directors elected by the holders of Preferred Shares;

obligate the Company to make aggregate annual payments in excess of \$500,000 or sell, transfer, pledge or license any material technology or intellectual property of the Company, other than a non-exclusive license in the ordinary course of business; 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 General Corporation Law of the State of Delaware

We are subject to Section 203 of the General Corporation Law of the State of Delaware, or 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 of the DGCL 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 of the DGCL 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, or the Bylaws, include a number of provisions that may have the effect of deterring hostile takeovers or delaying or preventing changes in control of the 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 our 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 without further action by our stockholders, as described under “—Preferred Stock” above.

Fourth, our Certificate of Incorporation and Bylaws provide for a classified Board of Directors in which approximately one-third of the directors are elected each year. Consequently, any potential acquirer would need to successfully complete two proxy contests in order to take control of our 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 Certificate of Incorporation and Bylaws could discourage potential acquisition proposals and could delay or prevent a change in control of the management of our company.

Listing

Our common stock is listed on the NASDAQ Capital Market under the symbol “TBIO”.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Wells Fargo Shareowner Services. Its address is 1110 Centre Pointe Curve, Suite 101, Mendota Heights, MN 55120 and its telephone number is 1-855-217-6361.

DESCRIPTION OF DEBT SECURITIES

We may issue debt securities from time to time, in one or more series, as either senior or subordinated debt or as senior or subordinated convertible debt. While the terms we have summarized below will apply generally to any debt securities that we may offer under this prospectus, we will describe the particular terms of any debt securities that we may offer in more detail in the applicable prospectus supplement. The terms of any debt securities offered under a prospectus supplement may differ from the terms described below. Unless the context requires otherwise, whenever we refer to the indenture, we also are referring to any supplemental indentures that specify the terms of a particular series of debt securities.

We will issue the debt securities under the indenture that we will enter into with the trustee named in the indenture. The indenture will be qualified under the Trust Indenture Act of 1939, as amended, or the Trust Indenture Act. We have filed the form of indenture as an exhibit to the registration statement of which this prospectus is a part, and supplemental indentures and forms of debt securities containing the terms of the debt securities being offered will be filed as exhibits to the registration statement of which this prospectus is a part or will be incorporated by reference from reports that we file with the SEC.

The following summary of material provisions of the debt securities and the indenture is subject to, and qualified in its entirety by reference to, all of the provisions of the indenture applicable to a particular series of debt securities. We urge you to read the applicable prospectus supplements and any related free writing prospectuses we authorize for use in connection with a specific offering of debt securities, as well as the complete indenture that contains the terms of the debt securities.

General Matters

The indenture does not limit the amount of debt securities that we may issue. It provides that we may issue debt securities up to the principal amount that we may authorize and in any currency or currency unit that we may designate. Except for the limitations on consolidation, merger and sale of all or substantially all of our assets contained in the indenture, the terms of the indenture do not contain any covenants or other provisions designed to give holders of any debt securities protection against changes in our operations or financial condition or transactions involving us.

We may issue the debt securities issued under the indenture as “discount securities”, which means they may be sold at a discount below their stated principal amount. These debt securities, as well as other debt securities that are not issued at a discount, may be issued with “original issue discount”, or OID, for U.S. federal income tax purposes because of interest payment and other characteristics or terms of the debt securities. Material U.S. federal income tax considerations applicable to debt securities issued with OID will be described in more detail in any applicable prospectus supplement.

We will describe in the applicable prospectus supplement the terms of the series of debt securities being offered, including:

the title of the series of debt securities;

any limit upon the aggregate principal amount that may be issued;

the maturity date or dates;

the form of the debt securities of the series;

the applicability of any guarantees;

whether or not the debt securities will be secured or unsecured, and the terms of any secured debt;

whether the debt securities rank as senior debt, senior subordinated debt, subordinated debt or any combination thereof, and the terms of any subordination;

if the price (expressed as a percentage of the aggregate principal amount thereof) at which the debt securities will be issued is a price other than the principal amount thereof, the portion of the principal amount thereof payable upon declaration of acceleration of the maturity thereof, or if applicable, the portion of the principal amount of such debt securities that is convertible into another security or the method by which any such portion shall be determined;

the interest rate or rates, which may be fixed or variable, or the method for determining the rate and the date interest will begin to accrue, the dates interest will be payable and the regular record dates for interest payment dates or the method for determining such dates;

our right, if any, to defer payment of interest and the maximum length of any such deferral period;

if applicable, the date or dates after which, or the period or periods during which, and the price or prices at which, we may, at our option, redeem the series of debt securities pursuant to any optional or provisional redemption provisions and the terms of those redemption provisions;

the date or dates, if any, on which, and the price or prices at which we are obligated, pursuant to any mandatory sinking fund or analogous fund provisions or otherwise, to redeem, or at the holder's option to purchase, the series of debt securities and the currency or currency unit in which the debt securities are payable;

the denominations in which we will issue the series of debt securities, if other than denominations of \$1,000 and any integral multiple thereof;

any and all terms, if applicable, relating to any auction or remarketing of the debt securities of that series and any security for our obligations with respect to such debt securities and any other terms which may be advisable in connection with the marketing of debt securities of that series;

whether the debt securities of the series shall be issued in whole or in part in the form of a global security or securities; the terms and conditions, if any, upon which such global security or securities may be exchanged in whole or in part for other individual securities, and the depositary for such global security or securities;

if applicable, the provisions relating to conversion or exchange of any debt securities of the series and the terms and conditions upon which such debt securities will be so convertible or exchangeable, including the conversion or exchange price, as applicable, or how it will be calculated and may be adjusted, any mandatory or optional (at our option or at the holders' option) conversion or exchange features, the applicable conversion or exchange period and the manner of settlement for any conversion or exchange;

if other than the full principal amount thereof, the portion of the principal amount of debt securities of the series which shall be payable upon declaration of acceleration of the maturity thereof;

additions to or changes in the covenants applicable to the particular debt securities being issued, including, among others, the consolidation, merger or sale covenant;

additions to or changes in the events of default with respect to the securities and any change in the right of the trustee or the holders to declare the principal, premium, if any, and interest, if any, with respect to such securities to be due and payable;

- additions to or changes in or deletions of the provisions relating to covenant defeasance and legal defeasance;

- additions to or changes in the provisions relating to satisfaction and discharge of the indenture;

additions to or changes in the provisions relating to the modification of the indenture both with and without the consent of the holders of the debt securities issued under the indenture;

the currency of payment of the debt securities if other than U.S. dollars and the manner of determining the equivalent amount in U.S. dollars;

whether interest will be payable in cash or additional debt securities at our or the holders' option and the terms and conditions upon which the election may be made;