

INTERLEUKIN GENETICS INC  
Form POS AM  
March 23, 2016

As filed with the Securities and Exchange Commission on March 22, 2016

**Registration Statement No. 333-189749**

**UNITED STATES**

**SECURITIES AND EXCHANGE COMMISSION**

**WASHINGTON, D.C. 20549**

**POST-EFFECTIVE AMENDMENT NO. 3**

**TO**

**FORM S-1**

**REGISTRATION STATEMENT**

**under the**

**SECURITIES ACT OF 1933**

**INTERLEUKIN GENETICS, INC.**

*(Exact Name of Registrant as Specified in Its Charter)*

**Delaware**

(State or other jurisdiction of incorporation or  
organization)

**2835**

(Primary Standard Industrial  
Classification Code Number)

**94-3123681**

(I.R.S. Employer

Identification Number)

**135 Beaver Street**

**Waltham, Massachusetts 02452**

**(781) 398-0700**

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**Mark B. Carbeau**

**Chief Executive Officer**

**Interleukin Genetics, Inc.**

**135 Beaver Street**

**Waltham, Massachusetts 02452**

**(781) 398-0700**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

**Copies to:**

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**One Financial Center**

**Boston, Massachusetts 02111**

**(617) 542-6000**

**Approximate date of commencement of proposed sale to the public:** From time to time after this registration statement becomes effective.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933 check the following box.

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. "

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. "

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. "

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer " Accelerated filer "  
Non-accelerated filer " (Do not check if a smaller reporting company) Smaller reporting company x

**The registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the Registration Statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.**

**THE INFORMATION IN THIS PROSPECTUS IS NOT COMPLETE AND MAY BE CHANGED. THE SECURITY HOLDERS IDENTIFIED IN THIS PROSPECTUS MAY NOT SELL THESE SECURITIES UNTIL THE REGISTRATION STATEMENT FILED WITH THE SECURITIES AND EXCHANGE COMMISSION IS EFFECTIVE. THIS PROSPECTUS IS NOT AN OFFER TO SELL THESE SECURITIES AND IS NOT SOLICITING AN OFFER TO BUY THESE SECURITIES IN ANY STATE WHERE THE OFFER OR SALE IS NOT PERMITTED.**

**SUBJECT TO COMPLETION, DATED MARCH 22, 2016**

**PRELIMINARY PROSPECTUS**

**120,408,197 SHARES OF COMMON STOCK**

This prospectus relates to the resale, from time to time, by the selling stockholders named in this prospectus or their pledgees, donees, transferees, or other successors in interest of up to 120,408,197 shares of our common stock. These shares consist of 85,326,230 issued and outstanding shares and 35,081,967 shares underlying warrants. These shares and warrants were issued in connection with a private placement completed on May 17, 2013 and consist of (1) 43,715,847 shares and 32,786,885 shares underlying warrants issued to the investors in the private placement, (2) 28,160,200 shares issued to Pyxis Innovations Inc. upon conversion of 5,000,000 shares of our Series A-1 Convertible Preferred Stock immediately prior to the private placement, (3) 2,521,222 shares issued to Pyxis upon conversion of \$14,316,255 in principal amount of convertible debt immediately prior to the private placement, (4) 10,928,961 shares issued to Delta Dental Plan of Michigan, Inc. upon conversion of 500,000 shares of our Series B Convertible Preferred Stock immediately prior to the private placement, and (5) 2,295,082 shares underlying warrants issued to BTIG, LLC, the placement agent in the private placement, and its affiliates, as placement agent compensation.

Our common stock is traded on the OTCQB under the symbol "ILIU". On March 22, 2016, the closing sale price of our common stock on the OTCQB was \$0.09 per share.

The selling stockholders may offer and sell any of the shares from time to time at fixed prices, at market prices or at negotiated prices, and may engage a broker, dealer or underwriter to sell the shares. For additional information on the possible methods of sale that may be used by the selling shareholder, you should refer to the section entitled "Plan of Distribution" elsewhere in this prospectus. We will not receive any proceeds from the sale of any shares by the selling

stockholders. We may, however, receive the proceeds of any cash exercises of warrants. We do not know when or in what amount the selling stockholders may offer the shares for sale. The selling stockholders may sell any, all or none of the shares offered by this prospectus.

**AN INVESTMENT IN OUR COMMON STOCK INVOLVES RISKS. SEE THE SECTION ENTITLED “RISK FACTORS” BEGINNING ON PAGE 5.**

**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 \_\_\_\_\_, 2016

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You should read this prospectus and any applicable prospectus supplement before making an investment in the securities of Interleukin Genetics, Inc. See “Where You Can Find More Information” for more information. You should rely only on the information contained in this prospectus or a prospectus supplement. The Company has not authorized anyone to provide you with different information. This document may be used only in jurisdictions where offers and sales of these securities are permitted. You should assume that information contained in this prospectus, or in any prospectus supplement, is accurate only as of any date on the front cover of the applicable document. Our business, financial condition, results of operations and prospects may have changed since that date. Unless otherwise noted in this prospectus, “Interleukin Genetics,” “Interleukin,” “the Company,” “we,” “us,” “our” and similar terms refer to Interleukin Genetics, Inc.

### **Smaller Reporting Company – Scaled Disclosure**

Pursuant to Item 10(f) of Regulation S-K promulgated under the Securities Act of 1933, as indicated herein, we have elected to comply with the scaled disclosure requirements applicable to “smaller reporting companies,” including providing two years of audited financial statements..

## PROSPECTUS SUMMARY

*This summary highlights some information from this prospectus. It may not contain all the information important to making an investment decision. You should read the following summary together with the more detailed information regarding our Company and the securities being sold in this offering, including “Risk Factors” and other information incorporated by reference herein.*

### **Overview**

Interleukin Genetics, Inc. develops and markets proprietary genetic tests for chronic diseases and health-related conditions, and for informing lifestyle choices to facilitate wellness. Our tests provide information that is not otherwise available to empower individuals and their healthcare providers to manage their health and wellness through genetics-based insights and actionable guidance. We leverage our research, intellectual property, and genetic test development expertise in inflammation and metabolism to identify individuals whose risk for certain chronic diseases may be increased due to variants in one or more genes, which can enable a more personalized approach to the individual’s healthcare. We market our tests through healthcare professionals, partnerships with health and wellness companies, and through other distribution channels. Our lead products are our proprietary PerioPredict® genetic test that identifies individuals with a life-long predisposition to over-produce inflammation and our Inherent Health® line of genetic tests.

### **Our Platform**

We have developed a scientific and commercial platform that we believe offers unique approaches to improving outcomes for individuals at high risk for elevated systemic inflammation. Our platform is characterized by:

Our expertise in IL-1 biology. We have been at the forefront of understanding the role of IL-1 genetic variation in the clinical expression of inflammation in humans.

Proprietary assays and algorithms. Our existing tests, led by PerioPredict, are proprietary and provide unique insights that we believe enable individuals and their healthcare providers to better manage their health. We expect to develop and introduce more proprietary assays for specific inflammatory diseases.

Unique test development approach. We identify and validate patterns of genetic variations with clinical utility for selected chronic inflammatory diseases. This approach uses our proprietary patterns of IL-1 gene variations or may use those proprietary variations to anchor a broader set of other, non-proprietary genetic factors that can be added to a test to capture risk for a specific health outcomes that are of high clinical value.

Ability to support drug development. Our development platform may also useful in assessing differential drug outcomes that may be genetically influenced.

Highly automated CLIA lab. All our tests use customized genetic arrays that allow processing of clinical samples in our CLIA approved clinical genetics laboratory, located in Waltham, MA.

Value-added commercial approach. We partner with health and wellness companies, employers and others to leverage the unique information provided by our tests to drive greater patient engagement, more effective disease management and improved outcomes.

## **Business Strategy**

We market PerioPredict to employers and insurance carriers as a central component to an enhanced benefit design or wellness initiative that is intended to lower medical costs through disease avoidance and reduced disease progression and complications.

We target large employers, who are typically self-insured, that see value in the potential reduction of medical costs associated with the highly prevalent inflammatory diseases that our program can provide. Within this customer segment, initial targets tend to be progressive, wellness-minded companies that are engaged in other programs aimed at improving the overall health of their employees.

We also target insurance carriers, with a particular emphasis on companies with dental-medical integration (DMI) products, either in place or in development, and integrated delivery networks (IDNs), as these customers are best positioned to realize value from the reduction of medical costs associated with the highly prevalent inflammatory diseases that our program can provide.

This target customer segment represents a large market, as an estimated 170 million Americans have dental coverage through an insurance program. These customers are increasingly focused on DMI products, as the correlation between oral health and general health has become better understood. We believe the potential of our PerioPredict program to facilitate the realization of cost savings through reduced medical claims is well-aligned with this powerful trend in the insurance industry.

Our insurance carrier customers are also seeking differentiation, and the opportunity to be seen as adding value to their customers through novel product offerings, such as benefit plans that include PerioPredict genetic testing. For these customers, we typically establish demonstration projects aimed at providing evidence of the efficacy of our program in driving patient engagement, compliance and ultimately reduced costs. Once that demonstration is achieved, we believe the insurance carrier will be incentivized to incorporate our program broadly in their product offerings, thereby providing significant leverage to our commercialization efforts.

To create further leverage, we intend to partner with channel partners, primarily benefits consulting firms, to identify, and facilitate initial interactions with, potential customers. We have established one such relationship at this point, with Employee Benefit Consulting Group LLC, or EBCG, a firm with expertise in the U.S. insurance market and strong relationships with employers, insurance carriers, and health and wellness providers. We work with EBCG to build awareness of PerioPredict as a tool for personalizing patient care among insurance carriers, benefit plans and employer groups, and to potentially incorporate the test in the design of risk-based benefit plans.

PerioPredict is solely available through Interleukin Genetics. The web site for the PerioPredict test is [www.PerioPredict.com](http://www.PerioPredict.com). The information contained on our websites are not incorporated by reference into this prospectus. We have included our website addresses only as an inactive textual reference and do not intend them to be active links to our websites.

In addition, we plan to continue to sell tests under the Inherent Health® brand, primarily through our relationships with Alticor's Amway Global Company and Access Business Group LLC. Under these agreements, Amway's independent business owners, or IBOs, are able to purchase genetic tests. We believe our proprietary genetic test brands supports the efforts of Amway to develop personalized consumer products for their independent business owners (IBOs) customers. Sales with Amway through these business arrangements began in December 2009.

#### **Other Information Related to this Prospectus**

*The 2013 Private Placement*

On May 17, 2013, we entered into a Common Stock Purchase Agreement (the “2013 Purchase Agreement”) with various accredited investors (the “2013 Purchasers”), pursuant to which we sold securities to the 2013 Purchasers in a private placement transaction (the “2013 Private Placement”). In the 2013 Private Placement, we sold an aggregate of 43,715,847 shares of our common stock at a price of \$0.2745 per share for gross proceeds of \$12,000,000. The 2013 Purchasers also received warrants to purchase up to an aggregate of 32,786,885 shares of common stock an exercise price of \$0.2745 per share (the “2013 Warrants”). The 2013 Warrants have a term of seven years from the date they became exercisable. Sixty-three percent of the shares issuable pursuant to the 2013 Warrants were exercisable immediately upon issuance, and the remaining 37% became exercisable on August 9, 2013.

In addition, pursuant to the 2013 Purchase Agreement, as amended, each 2013 Purchaser had the right, at any time and from time to time on or before December 31, 2014 (the “Expiration Date”), to purchase at one or more subsequent closings its pro rata share of up to an aggregate of 18,214,936 additional shares of common stock at a purchase price of \$0.2745 per share and warrants to purchase up to an aggregate of 13,661,201 shares of common stock at an exercise price of \$0.2745 per share (the “Additional Investment”). If, prior to the Expiration Date, 2013 Purchasers had not purchased their entire pro rata share of the Additional Investment, 2013 Purchasers who had purchased their entire pro rata share of the Additional Investment, would have been entitled to purchase the unsold portion of the Additional Investment. This right expired unexercised on December 31, 2014.

Immediately prior to the closing of the 2013 Private Placement, and in accordance with the terms of the Purchase Agreement: (i) Pyxis Innovations Inc. (“Pyxis”), the sole holder of our outstanding Series A-1 Convertible Preferred Stock converted all 5,000,000 shares of outstanding Series A-1 stock into 28,160,200 shares of our common stock (the “Series A-1 Conversion”); (ii) Pyxis, the sole holder of our outstanding convertible debt, converted all of the principal amount of debt outstanding (\$14,316,255) into 2,521,222 shares of our common stock (the “Debt Conversion”); and (iii) Delta Dental Plan of Michigan, Inc. (“DDMI”), the sole holder of our outstanding Series B Convertible Preferred Stock converted all 500,000 outstanding shares of Series B stock into 10,928,961 shares of common stock (the “Series B Conversion”).

For its services as exclusive placement agent in the 2013 Private Placement, BTIG, LLC (“BTIG”) received cash compensation in the amount of approximately \$780,000 and BTIG and an affiliate received warrants to purchase an aggregate of 2,295,082 shares of our common stock, at an exercise price of \$0.2745 per share (the “2013 BTIG Warrants”). The 2013 BTIG Warrants expire on August 9, 2020.

In connection with the 2013 Private Placement, we also entered into a Registration Rights Agreement with the 2013 Purchasers, Pyxis, DDMI and BTIG, pursuant to which we were required to file a registration statement on Form S-1 within 45 days of May 17, 2013 to cover the resale of (i) the shares sold in the 2013 Private Placement and the shares of common stock underlying the 2013 Warrants issued in the 2013 Private Placement, (ii) the shares of common stock issued to Pyxis pursuant to the Series A-1 Conversion and the Debt Conversion, (iii) the shares of common stock issued to DDMI pursuant to the Series B Conversion, and (iv) the shares of common stock underlying the 2013 BTIG Warrants. Our failure to satisfy certain deadlines described in the Registration Rights Agreement may subject us to payment of certain monetary penalties.

### ***The 2014 Private Placement***

On December 23, 2014, we entered into a Securities Purchase Agreement (the “2014 Purchase Agreement”) with various accredited investors (the “2014 Purchasers”), pursuant to which we sold securities to the 2014 Purchasers in a private placement transaction, which we refer to herein as the 2014 Private Placement. In the 2014 Private Placement we sold an aggregate of 50,099,700 shares of our common stock at a price of \$0.1003 per share for gross proceeds of \$5.025 million. The 2014 Purchasers also received warrants to purchase up to an aggregate of 50,099,700 shares of common stock at an exercise price of \$0.1003 per share, which we refer to herein as the 2014 Warrants. The 2014 Warrants were exercisable immediately and have a term of seven (7) years from the date of grant.

For its services as exclusive placement agent BTIG, LLC received cash compensation in the amount of approximately \$155,250 and warrants to purchase 89,731 shares of Common Stock, which has terms identical to those issued to the 2014 Purchasers in the 2014 Private Placement, which we refer to herein as the 2014 BTIG Warrant.

On December 23, 2014, we also entered into a Registration Rights Agreement with the 2014 Purchasers and BTIG, pursuant to which we are required to file a registration statement on Form S-1 within 45 days of December 23, 2014 to cover the resale of (i) the shares of common stock sold to the 2014 Purchasers and the shares of common stock underlying the 2014 Warrants and (ii) the shares of common stock underlying the 2014 BTIG Warrants. Our failure to satisfy certain deadlines described in the Registration Rights Agreement may subject Interleukin to payment of certain monetary penalties.

### ***The December 2014 Debt Transaction***

On December 23, 2014, we also entered into a venture loan and security agreement (the “Loan Agreement”) with Horizon Technology Finance Corporation (the “Lender”) under which we have borrowed \$5.0 million, which we refer to herein as the December 2014 Debt Transaction. The loan bears interest at a floating rate equal to the One Month LIBOR Rate (with a floor of 0.50%) plus 8.50%. In the event that the One Month LIBOR Rate, as reported in the Wall Street Journal, exceeds 0.50%, the interest rate will be adjusted by an amount equal to the difference between such rates at the end of that particular month.

We have agreed to repay the Loan in forty-five (45) monthly payments consisting of fifteen (15) monthly payments of interest only followed by thirty (30) equal monthly payments of principal and interest. In addition, at the end of the repayment term (or at early termination of the loan) a final payment equal to 4.5% of the loan will be due and payable. We may prepay the loan by paying all accrued interest through the date of prepayment, the then outstanding principal balance and a prepayment premium equal to a declining percentage of the principal amount outstanding at the time of prepayment. That percentage will be 4% during the first fifteen months following the issuance of the loan, 2% during the following twelve months, and 1% thereafter.

Our obligations under the Loan Agreement are secured by a first priority security interest in substantially all of our assets other than our intellectual property. We have also agreed not to pledge or otherwise encumber our intellectual property assets, subject to certain exceptions.

The Loan Agreement includes customary affirmative and restrictive covenants, but does not include any covenants to attain or maintain certain financial metrics, and also includes customary events of default, including payment defaults, breaches of covenants, change of control and a material adverse change default. Upon the occurrence of an event of default and following any applicable cure periods, a default interest rate of an additional 5% may be applied to the outstanding loan balances, and the Lender may declare all outstanding obligations immediately due and payable and take such other actions as set forth in the Loan Agreement.

In connection with the Loan Agreement, the Company issued to the Lender and its affiliates warrants to purchase a total of 2,492,523 shares of common stock at an exercise price of \$0.1003 per share, which we refer to herein as the Lender Warrants. The Lender Warrants have a term of ten (10) years.



## RISK FACTORS

*An investment in shares of our common stock involves a high degree of risk. You should carefully consider the following information about these risks, together with the other information appearing elsewhere in this prospectus, including our financial statements and related notes thereto, before deciding to invest in our common stock. The occurrence of any of the following risks could have a material adverse effect on our business, financial condition, results of operations and future growth prospects. In these circumstances, the market price of our common stock could decline, and you may lose all or part of your investment.*

### **Risks Related to Our Business, Our Financial Results and Need for Financing**

*If we fail to obtain additional capital by the second half of 2016, we may have to end our operations and seek protection under bankruptcy laws.*

We expect that our current and anticipated financial resources will be adequate to maintain our current and planned operations only into the second half of 2016. We need significant additional capital to fund our continued operations, including for the commercialization efforts for our PerioPredict genetic test, continued research and development efforts, obtaining and protecting patents and administrative expenses. We have retained a financial advisor and are actively seeking additional funding, however, based on current economic conditions, additional financing may not be available, or, if available, it may not be available on favorable terms. In addition, the terms of any financing may adversely affect the holdings or the rights of our existing shareholders. For example, if we raise additional funds by issuing equity securities, further dilution to our then-existing shareholders will result. Debt financing, if available, may involve restrictive covenants that could limit our flexibility in conducting future business activities. We also could be required to seek funds through arrangements with collaborators or others that may require us to relinquish rights to some of our technologies, tests or products in development. If we cannot obtain additional funding on acceptable terms, we may have to discontinue operations and seek protection under U.S. bankruptcy laws.

*There is substantial doubt concerning our ability to continue as a going concern.*

Our financial statements have been prepared assuming that we will continue as a going concern which contemplates the realization of assets and satisfaction of liabilities in the normal course of business. We expect to incur further losses in the development of our business and have been dependent on funding operations through the issuance of convertible debt and the sale of equity securities. These conditions raise substantial doubt about our ability to continue as a going concern. Management's plans include increasing revenue through new arrangements with commercial distribution partners and continuing to finance operations through the private or public placement of debt and/or

equity securities. However, no assurance can be given at this time as to whether we will be able to achieve these objectives. The financial statements do not include any adjustment relating to the recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might be necessary should we be unable to continue as a going concern. We can provide no assurance that we will be successful in increasing revenues, or that we will receive additional funding on reasonable terms, or at all.

*The timing and amount of revenues, if any, that we may receive pursuant to any existing or future agreement we may enter into with insurance carriers or large employers is uncertain.*

The timing of any revenues that we may receive under any agreement we have or may enter into with an insurance carrier, large employer or other customer is very uncertain at this time and is dependent on a number of variables that are or may be beyond our control. We continue to engage in discussions for the use of our PerioPredict test with insurance companies and large employers who might ultimately adopt enhanced benefits designs or employer-sponsored wellness initiatives that incorporate PerioPredict, or utilize PerioPredict through other arrangements, through the use of consultants, channel partners and our internal management team. The failure to enter into any agreement with other insurance carriers or large employers and to receive significant revenues under any such agreement would have a material adverse effect on our business.

*We have a history of operating losses and expect these losses to continue in the future.*

We have experienced significant operating losses since our inception and expect these losses to continue for some time. We incurred losses from operations of \$6.3 million in 2014 and \$7.3 million in 2015. As of December 31, 2015, our accumulated deficit was \$129.0 million. Our losses result primarily from research and development, selling, general and administrative expenses and amortization of intangible assets. Although we generate revenues from sales of our genetic risk assessment tests, this may not be sufficient to result in net income in the foreseeable future. We will need to generate significant revenue to continue our research and development programs and achieve profitability. We cannot predict when, if ever, we will achieve profitability.

*The market for personalized health generally and genetic risk assessment tests in particular is unproven.*

The markets and customer base in the field of personalized health are not well established. Adoption of technologies in this emerging field requires substantial market development and there can be no assurance that channels for marketing our products can or will be successfully developed by us or others. As a result, there can be no assurance that our products will be successfully commercialized or that they can be sold at sufficient volumes to make them profitable. If our potential customers do not accept our products, or take a longer time to accept them than we anticipate, it will reduce our anticipated sales and materially harm our business.

The market for genetic risk assessment tests, as part of the field of personalized health, is at an early stage of development and may not continue to grow. The scientific community, including us, has only a limited understanding of the role of genes in predicting disease. The success of our genetic risk assessment tests will depend upon their acceptance as being useful and cost-effective to the customers who purchase these products, the physicians and other members of the medical community who recommend or prescribe them, as well as third-party payers, such as insurance companies and the government. We can only achieve broad market acceptance with substantial education about the benefits and limitations of genetic risk assessment tests while providing the tests at a fair cost. We expect to expend significant funds and resources to educate patients, dentists and other providers, and payers on the benefits of our PerioPredict test. There is no assurance that we will be able to successfully do so. Furthermore, while positive media attention resulting from new scientific studies or announcements can spur rapid growth in individual segments of the market, and also impact individual brands, news that challenges individual segments or products can have a negative impact on the industry overall as well as on sales of the challenged segments or products. The marketplace may never accept our products, and we may never be able to successfully commercialize our products, including the PerioPredict test.

*We could become subject to intense competition from other companies, which may damage our business.*

The field of personalized health is highly competitive. Our potential competitors in the United States and abroad are numerous and include, among others, major pharmaceutical and diagnostic companies, consumer products companies, specialized biotechnology firms, universities and other research institutions. Many of our competitors have considerably greater financial, technical, marketing and other resources. Furthermore, many of these competitors are more experienced than we are in discovering, commercializing and marketing products. These greater resources may allow our competitors to discover important genes or genetic markers and more quickly and effectively develop and commercialize genetic tests than we or our partners are able to do. If we are not able to successfully market genetic tests, either alone or through collaborations, our business will be materially harmed. We expect competition to intensify in our industry as technical advances are made and become more widely known.

*Ethical, legal and social issues related to genetic testing may reduce demand for our products.*

Genetic testing has raised concerns regarding the appropriate utilization and the confidentiality of information provided by genetic testing. Genetic tests for assessing a person's likelihood of developing a chronic disease have focused public attention on the need to protect the privacy of genetic information. For example, concerns have been expressed that insurance carriers and employers may use these tests to discriminate on the basis of genetic information, resulting in barriers to the acceptance of genetic tests by consumers. This could lead to governmental authorities prohibiting genetic testing or calling for limits on or regulating the use of genetic testing, particularly for diseases for which there is no known cure. Any of these scenarios could decrease demand for our products.

*Technological changes may cause our tests to become obsolete.*

We have to date focused our efforts on genetic tests based on a small number of candidate genes and genetic variants. It is now possible to use array technology to conduct whole genome association studies for risk assessment, which may make our technologies obsolete. In order to develop customers and markets for our genetic risk assessment tests, we may be required to invest substantial additional capital and other resources.

*We have limited experience and capabilities with respect to distributing, marketing and selling genetic tests on our own and will continue to depend substantially on third parties to commercialize our tests.*

We have limited experience and capabilities with respect to distributing, marketing and selling genetic risk assessment tests on our own. In June 2009, we announced the launch of our new Inherent Health brand of genetic tests. On October 26, 2009, we entered into an agreement with Amway Global, an affiliate of Alticor, pursuant to which it sells our Inherent Health brand of genetics tests through its e-commerce Web site via a hyperlink to our e-commerce site. In 2015 and 2014, revenues from this agreement accounted for 45% and 44% of our revenues, respectively. In addition, beginning in September 2012 and again in 2013, Access Business Group LLC, an affiliate of Alticor, placed purchase orders totaling approximately \$3.3 million consisting of weight management kits. The kits are included as part of a promotional bundle of products that Amway is now selling to their Individual Business Owners. In 2015 and 2014, revenues from this arrangement accounted for 13% and 32% of our revenues, respectively. We continue to engage in discussions for the use of our PerioPredict test with insurance companies and large employers who might ultimately adopt enhanced benefits designs or employer-sponsored wellness initiatives that incorporate PerioPredict, or utilize PerioPredict through other arrangements, through the use of consultants, channel partners and our internal management team. We have, to date, had very limited success in marketing and selling our genetic tests, including PerioPredict, and we can provide no assurance that our current or planned commercialization efforts will be successful.

*If we are unsuccessful in establishing additional strategic alliances, our ability to develop and market products and services may be damaged.*

Entering into additional strategic alliances for the development and commercialization of products and services based on our discoveries is an important element of our business strategy. We face significant competition in seeking appropriate collaborators. If we fail to maintain our existing alliances or to establish additional strategic alliances or other alternative arrangements, then our ability to develop and market products and services will be damaged. In addition, the terms of any future strategic alliances may be unfavorable to us or these strategic alliances may be unsuccessful.

*Because our products are based on emerging science, if we make changes to our tests based on new scientific findings, market acceptance of our products may decrease and we may be exposed to liability in excess of our product liability insurance coverage.*

Our genetic test products are based on emerging science, and we continue to conduct studies to further enhance the usefulness and scientific credibility of our products. If we make changes to our tests based on new data, it could harm our credibility, decrease market acceptance of our products or expose us to liability claims. We currently maintain product liability insurance, but it is often difficult to obtain, is expensive and may not be available in the future on

economically acceptable terms. In addition, potential product liability claims may exceed the amount of our insurance coverage or may be excluded from coverage under the terms of our policy. We may become subject to product liability claims that, even if they are without merit, could result in significant legal defense costs to us. If we are held liable for claims for which we are not indemnified or for damages exceeding the limits of our insurance coverage, those claims could materially damage our business and our financial condition. Any product liability claim against us or resulting recall of our products could create significant negative publicity.

*Current economic conditions could adversely affect our business and results of operations.*

Economic conditions and financial markets have been experiencing extreme disruption including, among other things, extreme volatility in prices of publicly traded securities, rating downgrades of certain investments and declining valuations of others. We believe current economic conditions and financial market turmoil could adversely affect our operations. Uncertainty about current and future economic conditions may cause consumers to reign in their spending generally, the impact of which may be that they stop or delay their purchases of our genetic tests and consumer products. If these circumstances persist or continue to worsen, our future operating results could be adversely affected, particularly relative to our current expectations.

*Our dependence on key executives and scientists could adversely impact the development and management of our business.*

Our success depends on the ability, experience and performance of our senior management and other key personnel. If we lose one or more of the members of our senior management or other key employees, it could damage our business. In addition, our success depends on our ability to continue to hire, train, retain and motivate skilled managerial and scientific personnel. The pool of personnel with the skill that we require is limited. Competition to hire from this limited pool is intense. We compete with numerous pharmaceutical and healthcare companies, as well as universities and non-profit research organizations in the highly competitive Boston, Massachusetts business area. Our current senior management team is employed by us under agreements that may be terminated by them for any reason upon adequate notice. There can be no assurances, therefore, that we will be able to retain our senior executives or replace them, if necessary. We do not maintain key man life insurance on any of our personnel.

*If Pyxis or any of its affiliates enters a business in competition with ours, certain of our directors might have a conflict of interest.*

We have entered into an agreement with our stockholder, Pyxis (collectively, with its affiliates, the “Interested Parties”), allocating corporate opportunities as permitted under Section 122(17) of the Delaware General Corporation Law. This agreement regulates and defines the conduct of certain of our affairs as they may involve the Interested Parties, and our powers, rights, duties and liabilities and those of our officers and directors in connection with corporate opportunities. Except under certain circumstances, the Interested Parties have the right to engage in the same or similar activities or lines of business or have an interest in the same classes or categories of corporate opportunities as we do. If any Interested Parties or one of our directors appointed by an Interested Party acquire knowledge of a potential transaction or matter that may be a corporate opportunity for both the Interested Party and us, to the fullest extent permitted by law, the Interested Party will not have a duty to inform us about the corporate opportunity. In addition, the Interested Party will not be liable to us or to other stockholders for breach of any fiduciary duty as a stockholder of ours for not informing us of the corporate opportunity, keeping it for its own account, or referring it to another person. Additionally, except under limited circumstances, if an officer or employee of an Interested Party who is also one of our directors is offered a corporate opportunity, such opportunity shall not belong to us. In addition, we agreed that such director will have satisfied his duties to us and not be liable to us or to you in connection with such opportunity.

*We may be prohibited from fully using our net operating loss carryforwards, which could affect our financial performance.*

As a result of the losses incurred since inception, we have not recorded a federal income tax provision and have recorded a valuation allowance against all future tax benefits of our net operating loss carryforwards. As of December 31, 2015, we had gross net operating loss (NOL) and research tax credit carryforwards of approximately \$88.2 million and \$1.6 million, respectively for federal income tax purposes, and of approximately \$11.0 million and \$1.0 million for state income tax purposes, expiring in varying amounts through the year 2035. Our ability to use these NOLs and credit carryforwards is subject to restrictions contained in the Internal Revenue Code which provide for limitations on our utilization of our net operating loss and credit carryforwards following a greater than 50% ownership change during the prescribed testing period. On March 5, 2003, we had such a change. As a result, all of our NOL carryforwards as of that date are limited as to utilization. The annual limitation may result in the expiration of certain of the carryforwards prior to utilization. In addition, our equity offerings, including those in 2013 and 2014, may have resulted in qualifying changes in ownership. A formal study, which we have not undertaken, is required to determine applicability of restrictions and might indicate that our NOL carryforwards are subject to additional limitations on utilization. In addition, in order to realize the future tax benefits of our net operating loss and tax credit carryforwards, we must generate taxable income, of which there is no assurance.

## **Risks Related to Our Intellectual Property**

*If we fail to obtain patent protection for our products and preserve our trade secrets, then competitors may develop competing products and services, which will likely decrease our sales and market share.*

Our success will depend on our ability to obtain patent protection in the United States and in other countries for our products and services. In addition, our success will also depend upon our ability to preserve our trade secrets and to operate without infringing upon the proprietary rights of third parties. We own rights to nine issued U.S. patents and have a number of additional U.S. patent applications pending. We have also been granted a number of corresponding foreign patents and have a number of foreign counterparts of our U.S. patents and patent applications pending. Our patent positions, and those of other pharmaceutical and biotechnology companies, are generally uncertain and involve complex legal, scientific and factual questions. Our ability to develop and commercialize products and services depends on our ability to:

obtain patents;

obtain licenses to the proprietary rights of others;

prevent others from infringing on our proprietary rights; and

protect trade secrets.

Our pending patent applications may not result in issued patents and any issued patents may never afford meaningful protection for our technology or products or provide us with a competitive advantage. Further, others may develop competing products, which avoid legally infringing upon, or conflicting with, our patents. There is no assurance that another company will not replicate one or more of our products, and this may harm our ability to do business. In addition, competitors may challenge any patents issued to us, and these patents may subsequently be narrowed, invalidated or circumvented.

From time to time, the U.S. Supreme Court, other federal courts, the U.S. Congress or the USPTO may change the standards of patentability and any such changes could have a negative impact on our business. There have been several cases involving “gene patents” and diagnostic claims that have been considered by the U.S. Supreme Court. A suit brought by multiple plaintiffs, including the American Civil Liberties Union, or ACLU, against Myriad Genetics, or Myriad, and the USPTO, could impact biotechnology and diagnostic patents. That case involves certain of Myriad’s U.S. patents related to the breast cancer susceptibility genes BRCA1 and BRCA2. The Federal Circuit issued a written decision on July 29, 2011 that reversed the decision of the U.S. District Court for the Southern District of New York that Myriad’s composition claims to “isolated” DNA molecules cover unpatentable subject matter. The Federal Circuit court instead held that the breast cancer genes are patentable subject matter. Subsequently, on March 20, 2012, the Supreme Court issued a decision in *Mayo Collaborative v. Prometheus Laboratories*, or Prometheus, a case involving patent claims directed to optimizing the amount of drug administered to a specific patient. According to that decision, Prometheus’ claims failed to add enough inventive content to the underlying correlations to allow the processes they

describe to qualify as patent-eligible processes that apply natural laws. The Supreme Court subsequently granted *certiorari* in the Myriad case, vacated the judgment, and remanded the case back to the Federal Circuit for further consideration in light of their decision in the Prometheus case. The Federal Circuit heard oral arguments on July 20, 2012, and issued a decision on August 16, 2012. The Federal Circuit reaffirmed its earlier decision and held that composition of matter claims directed to isolated nucleic acids are patent-eligible subject matter, but that method claims consisting of only abstract mental processes are not patent-eligible. On September 25, 2012, the ACLU filed a petition for a *writ of certiorari* asking the Supreme Court to review the Federal Circuit's decision with respect to the composition of matter claims. On November 30, 2012, the Supreme Court granted the petition and agreed to review the case. On June 13, 2013, the Supreme Court issued a decision in the Myriad case. According to the decision, claims directed to genomic DNA cover unpatentable subject matter. However, claims directed to cDNA are patent eligible subject matter.

On March 4, 2014, the USPTO issued a memorandum to patent examiners providing guidelines for examining process claims for patent eligibility in view of the Supreme Court decision in *Prometheus*. . On December 16, 2014 an interim guidance was issued that supersedes the March 4, 2014 memorandum but essentially followed the same direction for patent eligibility. The guidance indicates that claims directed to a law of nature, a natural phenomenon, or an abstract idea that do not meet the eligibility requirements should be rejected as non-statutory subject matter. We cannot assure you that our patent portfolio will not be negatively impacted by the decision described above, rulings in other cases or changes in guidance or procedures issued by the USPTO.

Congress directed the USPTO to study effective ways to provide independent, confirming genetic diagnostic test activity where gene patents and exclusive licensing for primary genetic diagnostic tests exist. This study will examine the impact that independent second opinion testing has on providing medical care to patients; the effect that providing independent second opinion genetic diagnostic testing would have on the existing patent and license holders of an exclusive genetic test; the impact of current practices on testing results and performance; and the role of insurance coverage on the provision of genetic diagnostic tests. The USPTO was directed to report the findings of the study to Congress and provide recommendations for establishing the availability of independent confirming genetic diagnostic test activity by June 16, 2012. On August 28, 2012, the Department of Commerce sent a letter to the House and Senate Judiciary Committee leadership updating them on the status of the genetic testing report. The letter stated in part: “Given the complexity and diversity of the opinions, comments, and suggestions provided by interested parties, and the important policy considerations involved, we believe that further review, discussion, and analysis are required before a final report can be submitted to Congress.” The USPTO issued a Request for Comments and Notice of Public Hearing on Genetic Diagnostic Testing on January 25, 2012, and held additional public hearings in February and March 2013. It is unclear whether the results of this study will be acted upon by the USPTO or result in Congressional efforts to change the law or process in a manner that could negatively impact our present or future patent portfolio.

There can be no assurance that the Supreme Court’s decision in either the *Myriad* or *Prometheus* case will not have a negative impact gene or diagnostic patents generally or the ability of biotechnology and diagnostic companies to obtain or enforce their patents in the future. Such negative decisions by the Supreme Court could have a material adverse effect on our existing patent portfolio and our ability to protect and enforce our intellectual property in the future.

We also rely on trade secrets and proprietary know-how that we seek to protect, in part, with confidentiality agreements. The third parties we contract with may breach these agreements, and we may not have adequate remedies for any breach. If they do not protect our rights, third parties could use our technology, and our ability to compete in the market would be reduced. We also realize that our trade secrets may become known through other means not currently foreseen by us. Our competitors may discover or independently develop our trade secrets.

*Third parties may own or control patents or patent applications and require us to seek licenses, which could increase our costs or prevent us from developing or marketing our products or services.*

We may not have rights under patents or patent applications that are related to our current or proposed products. Third parties may own or control these patents and patent applications in the United States and abroad. Therefore, in some cases, to develop or sell any proposed products or services with patent rights controlled by third parties, our collaborators or ourselves may seek, or may be required to seek, licenses under third-party patents and patent applications. If this occurs, we may have to pay license fees, royalties or both, to the licensor. If licenses are not available to us on acceptable terms, our collaborators or we may be prohibited from developing or selling our products or services.

### **Risks Related to Development, Clinical Testing and Regulatory Approval of Our Tests**

*Any tests that may be developed by us may be subject to regulatory clearance or approval, which can be lengthy, costly and burdensome.*

Our currently marketed tests were launched as laboratory developed tests, or LDTs, performed in our CLIA-certified clinical laboratory operating in Waltham, Massachusetts. We expect that our future LDTs will also be performed at our CLIA-certified laboratory. Although FDA believes that tests such as ours fall within its jurisdiction as medical devices, it has historically exercised enforcement discretion with respect to LDTs, meaning that such tests generally have not been subject to FDA regulatory requirements. However, the Agency's regulatory approach to LDTs is uncertain, and whether or when FDA will issue final guidance documents implementing the agency's proposed regulatory framework is unclear. It is also unclear how a final regulatory framework will affect our current and future tests, as the level of regulation will depend on the FDA's evaluation of the risk posed by the specific test. With respect to our LDTs that are not offered DTC, such as PerioPredict, if the FDA issues final guidance implementing a risk-based regulatory framework for LDTs, we intend to comply fully and acknowledge that non-compliance may result in enforcement actions, which could affect our ability to market and sell our tests and may harm our reputation. We are uncertain as to what, if any, regulatory requirements may apply to our tests in the future. We cannot provide any assurance that FDA regulation, including pre-market review or approval, will not be required in the future.

With respect to our Inherent Health tests, which have historically been offered DTC, the FDA has informed us that these tests are not LDTs and are not subject to enforcement discretion. We and the FDA are in the midst of discussing appropriate next steps for these tests. It is unclear which, if any, of these tests will be permitted to continue to be offered DTC, or for how long. We cannot provide any assurance that FDA regulation, including pre-market review or approval, will not be required for these tests in the future.

If the FDA requires us to obtain clearance through its 510k premarket notification process or obtain approval through its premarket approval, or PMA process, either as a condition of continuing to market our tests or bringing future tests to market, our business could be negatively impacted. Requiring FDA clearance or approval could be lengthy, costly and burdensome. In addition, depending upon the FDA's response to a submission we may be required to stop selling our tests, revise our tests significantly, or delay introduction of new tests. Additionally, if our tests become subject to more active regulation as medical devices by the FDA, we would be required to comply with requirements including establishment registration, device listing, adverse event reporting, and good manufacturing practices. We would also be subject to penalties, including seizure and injunction, for noncompliance with FDA requirements. Complying with FDA requirements could add additional costs and burdens to our operations.

*We are subject to government regulation which may significantly increase our costs and delay introduction of our products.*

We are subject to a variety of federal and state legal requirements including CLIA, the FD&C Act, state clinical laboratory licensure laws and implementing regulations. The growth of our business may increase the potential of being found in violation of these laws. Our risk of being found in violation of these laws and regulations is further increased by the fact that the technologies at issue are new and the applicability of statutory and regulatory provisions to these technologies has not been fully developed, implemented, or subjected to judicial review, and the statutory and regulatory provisions themselves are open to a variety of interpretations. Any action brought against us, or any business partners, for violation of these laws or regulations, even if we or they successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. If their or our operations are found to be in violation of any of these laws and regulations, they or we may be subject to any applicable penalty associated with the violation, including civil and criminal penalties, damages and fines, and they or we could be required to curtail or cease operations. Any of the foregoing consequences could seriously harm our business and our financial results.

*If we do not comply with governmental regulations applicable to our CLIA-certified laboratory, we may not be able to continue our operations.*

The establishment and operation of our laboratory is subject to regulation by numerous federal, state and local governmental authorities in the United States. The laboratory holds a CLIA certificate of compliance and is licensed by the Commonwealth of Massachusetts, and other states as required, which enables us to provide testing services to residents of all states. Failure to comply with state regulations or changes in state regulatory requirements, could result in a substantial curtailment or even prohibition of the operations of our laboratory and could have a material adverse effect on our business. CLIA is a federal law that regulates clinical laboratories that perform testing on human specimens for the purpose of providing information for the diagnosis, prevention or treatment of disease. To renew CLIA certification, laboratories are subject to survey and inspection every two years. Moreover, CLIA inspectors may make unannounced inspections of these laboratories. If we were to lose our CLIA certification or our state licenses, whether as a result of a revocation, suspension or limitation, we would no longer be able to continue our testing operations which would have a material adverse effect on our business.

*Tests based on our technology may require clinical trial testing, which can be lengthy, costly and burdensome.*

If the FDA decides to require pre-market clearance or approval of LDT's, we may be required to perform clinical trials prior to submitting a marketing application. If we are required to conduct clinical trials, whether using prospectively acquired tissue samples or archival samples, delays in the commencement or completion of clinical testing could significantly increase development costs and delay commercialization. The commencement of clinical trials may be delayed due to insufficient patient enrollment, which is a function of many factors, including the size of the patient population and the nature of the disease or condition being studied.

*Future therapeutic collaborators, if any, may be unable to obtain regulatory approval of any therapeutic product that they may develop.*

If, in the future, we enter into any collaborations relating to the use of our technology in the development of therapeutic products, any therapeutic products that our collaborators may develop will be subject to extensive governmental regulations relating to development, clinical trials, manufacturing and commercialization. Rigorous preclinical testing and clinical trials and an extensive regulatory review process are required to be successfully completed in the United States and in many foreign jurisdictions before a new therapeutic product can be sold. Satisfaction of these and other regulatory requirements is costly, time consuming, uncertain and subject to unanticipated delays. The time required to obtain FDA and other approvals for therapeutic products is unpredictable but typically exceeds several years. It is possible that none of the therapeutic products our collaborators may develop will obtain the appropriate regulatory approvals necessary for us or our collaborators to begin selling them. In addition, if the use of any test that we develop is necessary for the safe use of a collaborator's therapeutic product, we might be required to obtain clearance or approval of our test.

Furthermore, any regulatory approval to market a therapeutic product may be subject to limitations on the indicated uses. These limitations may limit the size of the market for the therapeutic product. Any therapeutic product that our collaborators may develop will also be subject to numerous foreign regulatory requirements governing the conduct of clinical trials, manufacturing and marketing authorization, pricing and third-party reimbursement. The foreign regulatory approval process includes all of the risks associated with FDA approval described above as well as risks attributable to the satisfaction of local regulations in foreign jurisdictions. Therefore, approval by the FDA of a therapeutic product does not assure approval by regulatory authorities outside the United States or vice versa.

*If we fail to comply with regulatory requirements, we could be subject to enforcement actions, which could affect our ability to market and sell our tests and may harm our reputation.*

If we in the future fail to comply with applicable federal, state or foreign laws or regulations, we could be subject to enforcement actions, which could affect the ability to successfully develop, market and sell our tests and could harm our reputation and lead to reduced acceptance of such tests or products by the market. These enforcement actions could include:

·  
warning letters;

·  
recalls, public notification or medical device safety alerts;

restrictions on, or prohibitions against, marketing such tests or products;

product seizures;

injunctions;

civil penalties, including monetary fines; and

criminal penalties.

*If we do not comply with laws regulating the protection of the environment and health and human safety, our business could be adversely affected.*

Our research and development activities involve the use of hazardous and chemicals materials, and we maintain quantities of various flammable and toxic chemicals in our facilities. We believe our procedures for storing, handling and disposing these materials in our facilities comply with the relevant local and Federal guidelines. Although we believe that our safety procedures for handling and disposing of these materials comply with the standards mandated by applicable regulations, the risk of accidental contamination or injury from these materials cannot be eliminated. If an accident occurs, we could be held liable for resulting damages, which could be substantial. We are also subject to numerous environmental, health and workplace safety laws and regulations, including those governing laboratory procedures, exposure to blood-borne pathogens and the handling of biohazardous materials. We may incur substantial costs to comply with, and substantial fines or penalties if we violate, any of these laws or regulations.

*Changes in healthcare policy could impact commercialization of our tests.*

In March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Affordability Reconciliation Act, or the ACA, became law. This law substantially changes the way health care is financed by both governmental and private insurers. The ACA contains a number of provisions that may impact our business and operations in ways we cannot currently predict. In particular, we believe that the ACA may impact adoption of Reimbursed Dental Plans and other reimbursed insurance plans that include our PerioPredict® test because there is uncertainty in the cost of compliance with the ACA and how that may impact employer coverage for adult dental care in their overall benefits plan.

In addition to the ACA, there will likely continue to be proposals by legislators at both the federal and state levels, regulators and third-party payors to reduce costs while expanding individual healthcare benefits. Certain of these changes could impose additional limitations on the prices we will be able to charge for our tests or the amounts of reimbursement available for our tests from governmental agencies or third-party payors. While in general it is too early to predict specifically what effect the ACA or any future healthcare reform legislation or policies will have on our business, current and future healthcare reform legislation and policies could have a material adverse effect on our business and financial condition.

### **Risks Related to Our Common Stock**

*Our common stock is listed on the OTCQB, which could result in a limited market for our common stock.*

Our common stock was listed on the NYSE Amex until August 16, 2010, when it was suspended for failure to comply with the NYSE Amex continued listing standards. Our common stock then began trading on the OTCQB™ under the symbol ILIU. This delisting could hurt our investors by reducing the liquidity and market price of our common stock. Additionally, the delisting could negatively affect us by reducing the number of investors willing to hold or acquire our common stock, which could negatively affect our ability to raise capital.

*Our stock price has been and is likely to continue to be volatile and the market price of our common stock may drop.*

In the three years ended December 31, 2015, our stock price has fluctuated from a low of \$0.01 to a high of \$0.55. Furthermore, the stock market has experienced significant volatility. The volatility of stocks for companies in our industry often does not relate to the operating performance of the companies represented by the stock. Some of the

factors that may cause the market price of our common stock to fluctuate include:

- the commercial success of the PerioPredict test;
- demand for and acceptance of our products;
- our ability to develop new relationships and maintain and enhance existing relationships with strategic partners;
- regulatory developments or enforcement in the United States and foreign countries;
- developments or disputes concerning patents or other proprietary rights;
- introduction of technological innovations or new products or services by us or our competitors;
- failure to secure adequate capital to fund our operations, or the issuance of equity securities at prices below fair market price;
- changes in estimates or recommendations by securities analysts, if any cover our common stock;
- litigation;
- future sales of our common stock;
- general market conditions;
- economic and other external factors or other disasters or crises;
- period-to-period fluctuations in our financial results; and

overall fluctuations in U.S. equity markets.

These and other external factors may cause the market price and demand for our common stock to fluctuate substantially, which may limit or prevent investors from readily selling their shares of common stock and may otherwise negatively affect the liquidity of our common stock. In addition, in the past, when the market price of a stock has been volatile, holders of that stock have instituted securities class action litigation against the company that issued the stock. If any of our stockholders brought a lawsuit against us, we could incur substantial costs defending the lawsuit. Such a lawsuit could also divert the time and attention of our management.

*Our management and their affiliates own a significant percentage of our stock and will be able to exercise significant influence over matters subject to stockholder approval.*

As of March 1, 2016, our executive officers, directors and their respective affiliates, beneficially owned approximately 43.9% of our outstanding common stock. Accordingly, these stockholders will be able to exert a significant degree of influence over our management and affairs and over matters requiring stockholder approval, including the election of our board of directors and approval of significant corporate transactions. This concentration of ownership could have the effect of entrenching our management and/or the board of directors, delaying or preventing a change in our control or otherwise discouraging a potential acquirer from attempting to obtain control of us, which in turn could have a material and adverse effect on the fair market value of our common stock.

*We do not expect to pay dividends for the foreseeable future and you should not expect to receive any funds without selling your shares of common stock, which you may only be able to do at a loss.*

We have never declared or paid any cash dividends on our capital stock. We currently intend to retain any earnings for use in the operation and expansion of our business and do not anticipate paying any cash dividends on our common stock in the foreseeable future. In addition, our ability to pay cash dividends is currently prohibited by the terms of the Loan Agreement with Horizon Technology Finance Corporation, and any future debt financing arrangement may contain terms prohibiting or limiting the amount of dividends that may be declared or paid on our common stock. Therefore, you should not expect to receive any funds without selling your shares, which you may only be able to do at a loss.

## SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the information incorporated by reference in this prospectus contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or Securities Act, and Section 21E of the Securities Exchange Act of 1934, or Exchange Act, regarding our strategy, future, operations, future financial position, future revenues, projected costs, and plans and objectives of management. You can identify these forward-looking statements by their use of words such as “anticipate,” “believe,” “estimate,” “expect,” “intend,” “may,” “plan,” “project,” “target,” “potential,” “will,” “would,” “could,” “should,” “continue,” and similar expressions. You also can identify the fact that they do not relate strictly to historical or current facts. There are a number of important risks and uncertainties that could cause our actual results to differ materially from those indicated by forward-looking statements. For a description of these risks and uncertainties, please refer to the section entitled “Risk Factors,” any other risk factors set forth in any information incorporated by reference in this prospectus, as well as any other risk factors and cautionary statements we include or incorporate by reference into this prospectus in the future. While we may elect to update forward-looking statements wherever they appear in this prospectus or in the documents incorporated by reference in this prospectus, we do not assume, and specifically disclaim, any obligation to do so, whether as a result of new information, future events or otherwise.

## USE OF PROCEEDS

The shares of common stock being offered by this prospectus are solely for the account of the selling stockholders. We will not receive any proceeds from the sale of these shares by the selling stockholders. We may, however, receive the proceeds of any cash exercises of Warrants which, if received, would be used by us for working capital purposes.

## MARKET FOR OUR COMMON STOCK

### Market Information

Our common stock currently trades under the symbol “ILIU” on the OTCQB™. The following table sets forth, for the periods indicated, the high and low sales prices for our common stock, as reported by the OTCQB™.

	High	Low
2015:		
First Quarter	\$0.46	\$0.11

Second Quarter	\$0.18	\$0.09
Third Quarter	\$0.16	\$0.08
Fourth Quarter	\$0.12	\$0.01

	High	Low
2014:		
First Quarter	\$0.38	\$0.25
Second Quarter	\$0.35	\$0.25
Third Quarter	\$0.29	\$0.11
Fourth Quarter	\$0.17	\$0.05

## Stockholders

As of March 11, 2016, there were approximately 122 stockholders of record and according to our estimate, approximately 2,421 beneficial owners of our common stock.

## DIVIDEND POLICY

We have never paid dividends to our stockholders. We currently intend to retain all available funds and any future earnings to fund the development and expansion of our business, and we do not anticipate paying any cash dividends in the foreseeable future. In addition, our ability to pay cash dividends is currently prohibited by the terms of the Loan Agreement with Horizon Technology Finance Corporation, and any future debt financing arrangement may contain terms prohibiting or limiting the amount of dividends that may be declared or paid on our common stock.

## MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

*The following discussion of our financial condition and results of operations should be read in conjunction with our audited Financial Statements and the notes thereto included elsewhere in this prospectus.*

### **General Overview and Trends**

Interleukin Genetics, Inc. develops and markets proprietary genetic tests for chronic diseases and health-related conditions. Our products provide information that is not otherwise available to empower individuals and their healthcare providers to manage their health and wellness through genetics-based insights and actionable guidance. We leverage our research, intellectual property, and genetic test development expertise in inflammation and metabolism to identify an individual's risk for severe and progressive chronic inflammatory diseases, thereby enabling personalized healthcare. We market our tests through healthcare professionals, partnerships with health and wellness companies, and other distribution channels. We have patents covering the use of specific patterns of gene variations for a number of common chronic diseases. Our lead products are our proprietary PerioPredict genetic test that identifies individuals with a life-long predisposition to over-produce inflammation and our Inherent Health line of genetic tests.

During the year ended December 31, 2015, our principal focus has been on commercializing our PerioPredict test, and on the sales of our Inherent Health brand of genetic tests and related programs.

PerioPredict serves as a central component to an enhanced benefit design or wellness initiative directed to lower medical costs through disease avoidance and reduced disease progression and complications. We position PerioPredict as a tool to drive medical value; empowering individuals and healthcare professionals with actionable genetics data. The test identifies individuals at high risk for elevated systemic inflammation, enabling a risk stratification framework to personalize care interventions and patient outreach. The program creates value through early identification of risk, elevated professional surveillance for disease detection, and enhanced patient engagement and compliance

We market PerioPredict to large employers, who are typically self-insured, and to insurance carriers. Our employer customers see value in the potential reduction of medical costs associated with the highly prevalent inflammatory diseases that our program can provide. Within this customer segment, initial targets tend to be progressive, wellness-minded companies that are engaged in other programs aimed at improving the overall health of their employees.

Within the insurance carrier segment, we place particular emphasis on carriers with dental-medical integration (DMI) products, either in place or in development, and integrated delivery networks (IDNs), as these customers are best positioned to realize value from the reduction of medical costs associated with the highly prevalent inflammatory diseases that our program can provide. This insurance carrier segment represents a large market, as an estimated 170 million Americans have dental coverage through an insurance program. These customers are increasingly focused on DMI products, as the correlation between oral health and general health has become better understood. We believe the potential of our PerioPredict program to facilitate the realization of cost savings through reduced medical claims is well-aligned with this powerful trend in the insurance industry.

We pursue these customers through our internal team, and through consultants and other third parties, including channel partners, primarily benefits consulting firms, who may be helpful to identify, and facilitate initial interactions with, potential customers. We have established one such relationship at this point, with Employee Benefit Consulting Group LLC (EBCG), a firm with expertise in the U.S. insurance market and strong relationships with employers, insurance carriers, and health and wellness providers. We work with EBCG to build awareness of PerioPredict as a tool for personalizing patient care among insurance carriers, benefit plans and employer groups, and to potentially incorporate the test in the design of risk-based benefit plans.

The timing of any revenues that we may receive from our marketing efforts is very uncertain at this time and is dependent on a number of variables, many of which we may have a limited ability to influence. We may never receive significant revenues for the PerioPredict test.

On April 11, 2014, we announced the pre-print online publication of our research study titled “Association of interleukin-1 gene variations with moderate to severe chronic periodontitis in multiple ethnicities” in the *Journal of Periodontal Research*. The study results from multiple ethnic groups further validated the association between periodontitis and the interleukin-1 beta (IL1B) composite genotype pattern, a specific genetic profile that can be elucidated by our PerioPredict genetic risk test. In addition, the study results demonstrated that detection of the IL1B variations tested provided added value in the prediction of moderate to severe periodontitis above and beyond the risk attributable to smoking and diabetes alone.

On April 22, 2014, we announced receipt of conditional approval from the New York State Department of Health to offer, process and report the results of the PerioPredict test for periodontal disease. The State of New York is the only U.S. state that requires an independent regulatory review process including technical validation with clinical utility for laboratory developed tests run within a CLIA certified laboratory. Conditional status will be removed on successful completion of a future additional review, the timing of which is determined solely by the State of New York. As a result of New York State conditional approval, the PerioPredict test is now available to dental providers and their patients in all 50 U.S. states.

Our Inherent Health brand of genetic tests includes the first-of-its-kind test for weight management that identifies an individual's genetic tendencies for weight gain related to either fat or carbohydrates in the diet. The Inherent Health brand also offers customers a full suite of affordable, easy-to-use and meaningful genetic tests in heart health, bone health and nutritional needs. In addition, we launched additional products under the name Wellness Select that allows our e-commerce customers to purchase any combination of our Inherent Health genetic tests at a discounted price.

We market our Inherent Health brand of genetic assessment tests primarily through our commercial relationships with Alticor Inc. affiliated companies. Alticor is a related party. On October 26, 2009, we entered into a Merchant Network and Channel Partner Agreement with Amway Corp., d/b/a/ Amway Global (Amway Global), a subsidiary of Alticor. Pursuant to this agreement, Amway Global sells our Inherent Health brand of genetic tests through its e-commerce website via a hyperlink to our e-commerce site. In 2015 and 2014, revenues from this agreement accounted for approximately 45% and 44% of our revenues, respectively.

Beginning in September 2012 and again in 2013, Access Business Group LLC (ABG), an affiliate of Alticor, placed purchase orders totaling approximately \$3.3 million consisting of weight management kits. The kits are included as part of a promotional bundle of products that Amway is now selling to their Individual Business Owners (IBOs). Of the \$3.3 million in orders received in 2013, \$1.8 million was related to the 2014 program and \$1.5 million was related to the 2013 program. Cash for the kits purchased for the 2013 program was received in the first quarter of 2013 and cash for the kits purchased for the 2014 program was received by December 31, 2013. As a component of the 2013 promotional program, and not reflective of actual product expiry, the kits were required to be redeemed before December 31, 2013. In February 2014, we removed the redemption date requirement for the 2013 promotional program, for which ABG paid us \$519,000 as a retrospective increase in the product purchase price. All revenues related to the 2013 promotional program, including the \$519,000, will remain deferred until the kits are redeemed or the breakage analysis determines the probability of eventual redemption is remote. In October 2014, we received \$250,000 as a retrospective increase in the product purchase price for unsold kits as consideration for extending the required redemption date of the 2014 promotional program to December 31, 2017. Cash received for these kits will be treated as deferred revenues until specific kits are returned for processing or on the final allowed redemption date of December 31, 2017. For the years ended December 31, 2015 and 2014, approximately 13% and 32%, respectively, of our revenue came from sales through ABG's promotional product bundle program.

On September 21, 2012, we entered into a License Agreement (the License Agreement) with Access Business Group International LLC (ABGI), an affiliate of Alticor. Pursuant to this License Agreement, we granted ABGI and its affiliates (the Licensees) a non-exclusive license to use the technology related to our Weight Management genetic test and to sell the Weight Management test in Europe, Russia and South Africa. ABGI, or a laboratory designated by ABGI, is responsible for processing the tests, and we receive a royalty for each test sold. The License Agreement has an initial term of five years from the date of first commercial sale of the Weight Management test under the agreement. For the years ended December 31, 2015 and December 31, 2014, \$191,000 and \$150,000, respectively, in license fees have been received pursuant to the License Agreement. The increase in license fees is due primarily to higher per-unit royalties resulting from the issuance of patents in the European Union and Russia, and additional unit volume from new Eastern European markets.

Our research and development expenses are focused on our own development efforts related primarily to our PerioPredict and cardiovascular disease genetic tests. We are also focusing on seeking potential commercial partners to validate our technology within their specific business model as a collaboration with little or no cost to us. This is different than in prior years when our development focus was concentrated in research and development to bring new test configurations to market.

We recognize revenue from genetic testing services when there is persuasive evidence of an arrangement, service has been rendered, the sales price is determinable and collectability is reasonably assured. Service is deemed to be rendered when the results have been reported to the individual who ordered the test. To the extent that tests have been prepaid but results have not yet been reported, recognition of all related revenue is deferred. During the fourth quarter of 2013, we concluded that sufficient historical customer genetic test redemption patterns existed to determine the period of time after which the likelihood of test redemption was remote for Inherent Health tests purchased. Based on our analysis of the redemption data, we estimate that period of time to be three years after the sale of a genetic test kit. Prior to making this determination, revenue was recognized only on test kits returned and processed. Beginning in the fourth quarter of 2013, we began to recognize breakage revenue based on the likelihood of test redemption becoming remote. The term remote requires statistical analysis of customer redemption patterns for all tests sold and returned. We analyzed redemption patterns from 2009 through 2015. Included in genetic test revenue in the years ended December 31, 2015 and December 31, 2014 is \$218,000 and \$309,000, respectively, of breakage revenue related to unredeemed genetic test kits from 2012 and 2011. We expect to continue to recognize breakage revenue and the corresponding deferred cost of goods as well as analyze the data on a quarterly basis based on the historical analysis.

On May 17, 2013, we entered into a Common Stock Purchase Agreement (the 2013 Purchase Agreement) with various accredited investors (the 2013 Investors), pursuant to which we sold securities to the 2013 Investors in a private placement transaction (the May 2013 Private Placement). In the May 2013 Private Placement, we sold an aggregate of 43,715,847 shares of our common stock at a price of \$0.2745 per share for gross proceeds of \$12,000,000. The 2013 Investors also received warrants to purchase up to an aggregate of 32,786,885 shares of common stock at an exercise price of \$0.2745 per share (the 2013 Warrants). The 2013 Warrants are all currently exercisable and have a term of seven years from the date they became exercisable.

In addition, pursuant to the 2013 Purchase Agreement, each 2013 Investor had the right, at any time on or before June 30, 2014 (the Expiration Date), to purchase at one or more subsequent closings its pro rata share of up to an aggregate of 18,214,936 additional shares of common stock at a purchase price of \$0.2745 per share and warrants to purchase up to an aggregate of 13,661,201 shares of common stock at an exercise price of \$0.2745 per share. The Expiration Date was extended until December 31, 2014, and this right expired unexercised.

On December 23, 2014, we entered into a Securities Purchase Agreement (the 2014 Purchase Agreement) with various accredited investors (the 2014 Investors), pursuant to which we sold to the 2014 Investors in a private placement transaction (the December 2014 Private Placement) an aggregate of 50,099,700 shares of our common stock at a price of \$0.1003 per share for gross proceeds of approximately \$5.025 million. The 2014 Investors also received warrants to purchase up to an aggregate of 50,099,700 shares of common stock at an exercise price of \$0.1003 per share (the 2014 Warrants). The 2014 Warrants are all currently exercisable and have a term of seven years.

On December 23, 2014, we also entered into a venture loan and security agreement (the Loan Agreement) with Horizon Technology Finance Corporation (the Lender) under which we have borrowed \$5.0 million (the December 2014 Debt Transaction). The loan bears interest at a floating rate equal to the One Month LIBOR Rate (with a floor of 0.50%) plus 8.50%. In the event that the One Month LIBOR Rate, as reported in the Wall Street Journal, exceeds 0.50%, the interest rate will be adjusted by an amount equal to the difference between such rates at the end of that particular month. At December 31, 2015, the rate was 9.0% per annum. The loan is to be repaid in forty-five (45) monthly payments consisting of fifteen (15) monthly payments of only interest followed by thirty (30) equal monthly payments of principal and interest. In addition, at the end of the repayment term (or at early termination of the loan) a final payment equal to 4.5% of the loan will be due and payable. Our obligations under the Loan Agreement are secured by a first priority security interest in substantially all of our assets other than our intellectual property. We have also agreed not to pledge or otherwise encumber our intellectual property assets, subject to certain exceptions. In connection with the Loan Agreement, we issued to the Lender and its affiliates warrants to purchase a total of 2,492,523 shares of common stock at an exercise price of \$0.1003 per share, which we refer to herein as the Lender Warrants. The Lender Warrants have a term of ten (10) years.

In the genetic test business, competition is in flux and the markets and customer base are not well established. Adoption of new technologies by customers requires substantial market development and customer education.

Historically, we have focused on our relationship with our primary customer, Alticor, a significant direct marketing company, in order to assist us in developing the market for our products and educating our potential customers. Our challenge in 2016 and beyond will be to develop the market for our personalized health products, in particular our PerioPredict® test, and we will allocate considerable resources to commercialization of our PerioPredict® genetic test. Due to the early stage of this initiative, we cannot predict with certainty fluctuations we may experience in our genetic test revenues or whether such revenues will ever be material, or if material, will be sustained in future periods.

## **Liquidity and Capital Resources**

As of December 31, 2015, we had cash and cash equivalents of \$4.7 million.

Cash used in operations was \$6.7 million for the year ended December 31, 2015 compared to \$5.7 million for the year ended December 31, 2014. Cash used in operations is primarily impacted by operating results and changes in working capital, particularly the timing of prepaid expenses, reduced payments from related party receivables, inventory levels, receipt of orders and the timing of payments to suppliers.

Cash used in investing activities was \$82,000 for the year ended December 31, 2015, compared to \$98,000 for the year ended December 31, 2014. Capital additions were \$82,000 for the year ended December 31, 2015, of which approximately \$11,000 related to internal use software, \$50,000 related to the addition of laboratory equipment and \$21,000 related to the addition of new servers. Capital additions were \$98,000 for the year ended December 31, 2014, partially offset by a \$10,000 refund from our landlord related to the surrender of the approximately 6,000 square feet of subleased office and laboratory space as of March 31, 2014, which included approximately \$28,000 related to internal use software, \$5,000 related to the addition of laboratory equipment, \$16,000 related to the addition of a new server, and \$49,000 related to software enhancements to our laboratory access server.

Cash provided by financing activities was \$13,000 for the year ended December 31, 2015 compared to \$9.7 million for the year ended December 31, 2014. The Company received \$21,000 from stock purchases through the employee stock purchase plan during the year ended December 31, 2015 compared to \$32,000 for the year ended December 31, 2014. The \$21,000 received through the employee stock purchase plan for the year ended December 31, 2015 was offset in part by \$8,000 in additional fees related to the December 2014 Private Placement. The aggregate net cash proceeds from the December 2014 Private Placement and the December 2014 Debt Transaction accounted for the \$9.7 million in cash provided by financing activities in 2014.

The amount of cash we generate from operations is currently not sufficient to continue to fund operations and grow our business. We expect that our current financial resources will be adequate to maintain our current and planned operations into the second half of 2016. We believe our success depends on our ability to generate significant revenues for the PerioPredict® test through potential partners. The timing of any revenues that we may receive for the PerioPredict® test is uncertain at this time, and is contingent upon a number of factors, including our ability to consummate arrangements with other partners to promote the PerioPredict test, our partners' ability to develop reimbursed insurance plans and to develop a viable market for such plans, and the timing of utilization of the PerioPredict test pursuant to insured plans, or other possible arrangements. We do not expect to receive any material revenues from the PerioPredict test until mid to late 2016, at the earliest, and the timing of any such revenues may be substantially later. We may never receive significant revenues from the PerioPredict test.

Until such time, if ever, that we generate revenues sufficient to fund operations, we may fund our operations by issuing common stock, debt or other securities in one or more public or private offerings, as market conditions permit, or through the incurrence of debt from commercial lenders. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interest of our existing stockholders will be diluted, and the terms may include liquidation or other preferences that adversely affect the rights of our stockholders. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring debt, making capital expenditures or declaring dividends. There can be no assurance that additional funds will be available when we need them on terms that are acceptable to us, or at all. If adequate funds are not available to us on a timely basis, we may be required to delay, limit, reduce or cease activities or operations or enter into licenses or other arrangements with third parties on terms that may be unfavorable to us or sell, license or relinquish rights to develop or commercialize our products, technologies or intellectual property. However, no assurance can be given at this time as to whether we will be able to achieve these objectives. The financial statements do not include any adjustment relating to the recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might be necessary should we be unable to continue as a going concern.

## **Results of Operations**

### ***Years Ended December 31, 2015 and 2014***

Total revenue was \$1.44 million for the year ended December 31, 2015 compared to \$1.81 million for the year ended December 31, 2014. The change in total revenue is largely attributable to a decrease in the number of kits returned for processing related to our sales through ABG's promotional product bundle program. Breakage revenue recognized in the year ended December 31, 2015 was \$218,000, compared to \$309,000 of breakage revenue recognized in the year ended December 31, 2014, also contributing to the change in revenue. Royalty revenue from our license agreement with ABGI was \$191,000 for the year ended December 31, 2015, compared to \$151,000 of royalties earned in the year ended December 31, 2014, partially offsetting the decrease in total revenue.

During the year ended December 31, 2015, 45% of our sales revenue came through our Merchant Network and Channel Partner Agreement with Amway Global compared to 44% during the year ended December 31, 2014. During the same periods, 13% and 32%, respectively, of our revenue came from sales through ABG's promotional product bundle program.

Cost of revenue for the year ended December 31, 2015 was \$1.41 million, or 98.1% of revenue, compared to \$1.44 million, or 79.3% of revenue, for the year ended December 31, 2014. The increase in the cost of revenue as a percentage of revenue in the year ended December 31, 2015 compared to the year ended December 31, 2014 is primarily attributable to the fixed laboratory costs being applied to a lower volume of genetic tests being processed in the period. Deferred cost of revenue related to breakage revenue was \$10,000 for the year ended December 31, 2015 compared to \$13,200 for the year ended December 31, 2014. Also included in cost of revenue for the year ended December 31, 2015 is a charge of \$27,000 from the write off of obsolete raw materials and kits related to ABG's 2013 promotional program.

Research and development expenses were \$1.3 million for the year ended December 31, 2015, compared to \$843,000 for the year ended December 31, 2014. The increase of \$456,000, or 54.1%, is primarily attributable to expenses related to Dr. Kornman moving back to the R&D department in April 2015 as President and Chief Scientific Officer from his previous position as CEO. While he served as CEO, expenses generated by Dr. Kornman were recorded as selling, general and administrative expenses. The increase in research and development expenses was also partially due to increased compensation expense related to annual salary increases for existing staff.

Selling, general and administrative expenses were \$5.9 million for the year ended December 31, 2015, compared to \$5.8 million for the year ended December 31, 2014. The 1.7% increase is primarily attributable to severance expenses for the former chief marketing officer and recruiting fees for the new chief executive officer and search for a new chief commercial officer.

Interest expense was \$609,000 for the year ended December 31, 2015, as compared to \$11,000 for the year ended December 31, 2014. Interest expense related to the venture loan and security agreement entered into with Horizon Technology Finance Corporation on December 23, 2014 was \$456,000 and \$11,000 for the years ended December 31, 2015 and 2014, respectively. Also included in interest expense for the year ended December 31, 2015 is \$153,000 attributable to non-cash interest expense related to venture loan issuance costs, final payment obligations of the venture loan and fair value of the 2014 Warrants.

### **Critical Accounting Policies and Estimates**

Our discussion and analysis of our financial condition and results of operations are based upon our financial statements. The preparation of these financial statements and related disclosures in conformity with accounting principles generally accepted in the United States of America requires us to (i) make judgments, assumptions and estimates that affect the reported amounts of assets, liabilities, revenue and expenses; and (ii) disclose contingent assets and liabilities. A critical accounting estimate is an assumption that could have a material effect on our consolidated financial statements if another, also reasonable, amount were used or a change in the estimates is reasonably likely from period to period. We base our accounting estimates on historical experience and other factors that we consider reasonable under the circumstances. However, actual results may differ from these estimates. To the extent there are material differences between our estimates and the actual results, our future financial condition and results of operations will be affected. Our most critical accounting policies and estimates upon which our financial condition depends, and which involve the most complex or subjective decisions or assessments are set forth in Note 3 to our financial statements included in Item 8 presented elsewhere herein.

## BUSINESS

### Overview

Interleukin Genetics, Inc. develops and markets proprietary genetic tests for chronic diseases and health-related conditions, and for informing lifestyle choices to facilitate wellness. Our tests provide information that is not otherwise available to empower individuals and their healthcare providers to manage their health and wellness through genetics-based insights and actionable guidance. We leverage our research, intellectual property, and genetic test development expertise in inflammation and metabolism to identify individuals whose risk for certain chronic diseases may be increased due to variants in one or more genes, which can enable a more personalized approach to the individual's healthcare. We market our tests through healthcare professionals, partnerships with health and wellness companies, and through other distribution channels. Our lead products are our proprietary PerioPredict® genetic test that identifies individuals with a life-long predisposition to over-produce inflammation and our Inherent Health® line of genetic tests.

### Our Platform

We have developed a scientific and commercial platform that we believe offers unique approaches to improving outcomes for individuals at high risk for elevated systemic inflammation. Our platform is characterized by:

Our expertise in IL-1 biology. We have been at the forefront of understanding the role of IL-1 genetic variation in the clinical expression of inflammation in humans.

Proprietary assays and algorithms. Our existing tests, led by PerioPredict, are proprietary and provide unique insights that we believe enable individuals and their healthcare providers to better manage their health. We expect to develop and introduce more proprietary assays for specific inflammatory diseases.

Unique test development approach. We identify and validate patterns of genetic variations with clinical utility for selected chronic inflammatory diseases. This approach uses our proprietary patterns of IL-1 gene variations or may use those proprietary variations to anchor a broader set of other, non-proprietary genetic factors that can be added to a test to capture risk for a specific health outcomes that are of high clinical value.

Ability to support drug development. Our development platform may also be useful in assessing differential drug outcomes that may be genetically influenced.

Highly automated CLIA lab. All our tests use customized genetic arrays that allow processing of clinical samples in our CLIA approved clinical genetics laboratory, located in Waltham, MA.

Value-added commercial approach. We partner with health and wellness companies, employers and others to leverage the unique information provided by our tests to drive greater patient engagement, more effective disease management and improved outcomes.

## **Market Conditions and Trends**

Until recently, physicians and dentists treated patients with physical symptoms, such as pain or altered function, based on how early the diseases were discovered and the severity of damage produced. Management of chronic diseases has largely focused on identifying factors that “cause” the disease and ways to alter or reverse the disease after it has been diagnosed. Some causes, such as elevation of “bad” cholesterol in heart disease, are used for public health awareness and for patient testing to draw attention to early management. Common examples of altering or reversing initiating factors include calorie reduction in the case of being overweight, reducing levels of LDL cholesterol in the case of heart disease, reduction of bacteria with reduction of inflammation in the case of periodontal disease, and increasing estrogen levels in the case of osteoporosis. However, it is now well established that while initiating factors are essential for disease, the severity of chronic diseases and their complications are mostly the result of modifying factors, such as smoking and genetics, that alter an individual’s response to the disease initiator, and consequently the amount of damage produced.

The future of healthcare has been described as P4 medicine: Predictive, Preventive, Personalized, and Participatory. Personalization, which path are you on; Predictive, can we identify that you are on the disease path prior to development of severe disease; Prevention, if we can identify early which path you are on, what can we do to tilt the curve down to extend the years of wellness or prevent the disease complications entirely; and Participatory, to acknowledge the individual’s responsibility in managing and preventing chronic diseases.

Many people have the mistaken impression that genetics dictates how an individual will look or feel and that there is nothing one can do to change that genetic destiny. While it is true that some genetics have a permanent effect on a person's appearance or condition (referred to as a phenotype), the vast majority of genetic influences on one's phenotype can be modified. An active field of research in healthcare today is to better understand the interaction between our environment, behavior, and genes. The scientific community is learning more each day about the role and significance of genetic variations, such as single nucleotide polymorphisms, or SNPs, and haplotypes, on an individual's health. SNP and haplotype analysis, coupled with detailed knowledge of environmental factors, now is an important area of study aimed at improving human health. A SNP may cause a gene to make a different amount of a protein for a given condition, change the timing of protein synthesis or make a variant form of the protein; each of these changes may lead to a discernible biological impact. However, certain lifestyle changes can influence significantly whether a set of genes are activated or inactivated despite the variation in the gene. Thus, while the propensity for physiological impact is always present for a given set of genes and their variants, whether or not the condition manifests itself is often controlled by our environment and the lifestyle choices we make.

We have focused our research, development and commercialization efforts on identifying combinations of SNP variations that alter biology involved in inflammation or metabolic disease. We have worked with leading universities throughout the world to identify genetic variations that influence the body's inflammatory response. Our scientific advisory board includes Sir Gordon Duff, a pioneer in understanding the role that genetics plays in inflammatory disease pathways. In addition, we have conducted clinical studies for various indications throughout the world involving tens of thousands of individuals to demonstrate clinical value of our tests. To date, some of our clinical research collaborations include studies at: Stanford University; the University of North Carolina at Chapel Hill; the Mayo Clinic; Brigham & Women's Hospital (Harvard Medical School); University of California at San Francisco; University of California at San Diego; New York University Medical Center; University of Sheffield, (UK); Yonsei University Medical Center, (Korea); Tongji Medical College, (China); and Tuft's University Medical Center.

Inflammation is one of the body's most basic protective mechanisms, and the understanding of the role of inflammation in disease has increased over the past few years. It is generally accepted that many chronic conditions begin with a challenge to the tissues of the body and that the inflammatory response system of an individual mediates the clinical manifestation. It is also now thought that SNP variations in the genes that influence the inflammatory process can have an important impact on the variation of disease progression among individuals who experience the same initiating events or conditions.

Chronic conditions that have traditionally been considered to be primarily inflammatory diseases include periodontitis and rheumatoid arthritis. In recent years, inflammation has been found to affect several other major diseases of aging that were not previously thought of as inflammatory diseases, including heart disease, diabetes and osteoarthritis. For example, an individual who has a strong inflammatory response may be more successful in clearing a bacterial infection than an individual with a less robust inflammatory response. However, that strong inflammatory response may actually cause that individual to be at increased risk for a more severe course in one or more of the chronic diseases that generally affect people in mid to later life, such as cardiovascular disease, osteoarthritis, and periodontal disease. There is growing evidence that genetic variants in IL-1 influence individual risk of developing these diseases and their severity and complications.

IL-1 is now recognized as a major driver of the inflammation involved in many of the chronic diseases, as evidenced by more than ten IL-1 blocking drugs now in active clinical development by pharmaceutical and biotechnology companies for major indications, including secondary cardiovascular events and type 2 diabetes mellitus.

Our proprietary IL-1 genetic patterns provide multiple access points to improve management of serious, highly prevalent conditions that are currently undermanaged. Our tests have shown significant value in predicting severe and progressive periodontitis, secondary heart attacks, and progression of knee osteoarthritis, and have the ability to differentiate clinical responses to IL-1 blocking drugs and preventive dental care. Since our IL-1 genetic tests identify individuals with a lifelong tendency to over produce IL-1, we are also engaged in projects to demonstrate how some of our tests may add value in the clinical management of the overall systemic inflammatory burden.

## **Our Product Focus**

On November 25, 2013 we announced the introduction of the PerioPredict genetic test, and during 2015 our principal focus was on commercializing the test.

### *Product Definition and Positioning*

PerioPredict is a genetic risk test that analyzes genetic variations associated with inflammation and identifies individuals with a life-long predisposition to over-produce inflammation. PerioPredict identifies specific polymorphisms (genetic variations) in genes that regulate the production of interleukin-1 cytokines. Higher gingival levels of these proteins are associated with destruction of soft tissue attachment and bone, and increased severity of periodontitis in certain patient populations. Results from several clinical studies indicate that certain inflammatory cytokine levels in the gingival crevicular fluid were significantly higher in PerioPredict positive patients than in patients who were PerioPredict negative. PerioPredict testing need only be done once in a lifetime and identifies “at risk” patients early on, often before the onset of clinical symptoms, to enable targeted treatment. This objective information allows the dentist and hygienist to better guide treatment to reduce complications and costs associated with chronic inflammatory disease, such as severe periodontitis. The test may also help to establish long-term patient relationships based on the patient’s prevention and care plan guided by the individual’s genetic predisposition. Sample collection requires only a simple, easy-to-use cheek swab, and PerioPredict has been validated for use in all major ethnic groups. PerioPredict identifies adults at increased risk for severe periodontal disease who would not have otherwise been identified by a history of smoking or diabetes.

We position PerioPredict as a tool to drive medical value; empowering individuals and healthcare professionals with actionable genetics data. The test serves as the central component in a program to identify individuals at high risk for elevated systemic inflammation, enabling a risk stratification framework to personalize care interventions and patient outreach. The program creates value through early identification of risk, elevated professional surveillance for disease detection, and enhanced patient engagement and compliance.

Elevated systemic inflammation levels are implicated in the development and complications of numerous chronic diseases, such as heart attack, stroke, and type 2 diabetes. Severe periodontitis is one of the most common causes of increased systemic inflammation and is implicated as a risk factor for several other diseases. Studies demonstrate that preventive dental care can lower a patient's systemic inflammatory burden and is a practical, low-cost intervention access point to help manage systemic health. Additional health economic studies document that treatment of periodontitis is associated with substantial medical cost savings for patients with certain chronic diseases.

Leveraging this substantial clinical and health economics data, PerioPredict can be an essential element in an enhanced benefits design or employer-sponsored wellness initiative to identify individuals at high risk and to drive a risk stratification framework to personalize care interventions and patient outreach. The program integrates three components: 1) PerioPredict genetic test, 2) professional education to dental offices and 3) outreach to high risk members to enhance engagement and compliance. The overall goal of the program is to target high-risk individuals for more proactive dental care and to provide the education and support to ensure compliance with a modified care-plan designed to reduce systemic inflammation.

#### *Clinical Utility and Health Economics*

The clinical utility of the PerioPredict test is supported by the large validation study conducted by the University of Michigan and referred to as the Michigan Personalized Prevention Study, or MPPS. The objective of the MPPS was to improve dental care by identifying and using certain risk factors to set preventative treatment regimens. On August 6, 2012, we announced that we had received top line results from the MPPS, and on June 10, 2013, we announced the publication of the MPPS results in the *Journal of Dental Research*. The study examined data from 5,117 patients monitored for 16 consecutive years. These results indicated that in low risk patients (those with none of three risk factors: smoking, diabetes, and a PerioPredict result indicating the individual was at high risk of contracting periodontitis) there was no significant difference between two dental preventive visits per year and one preventive visit per year in the percentage of patients who had tooth extractions over the 16 year monitoring period; 13.8% versus 16.4%, respectively. In addition, these results indicate that in high risk patients (those with any one of the three risk factors, with PerioPredict being the most common of the three), two preventive visits per year significantly reduced the percentage of patients who had extractions over a 16 year monitoring period compared to one preventive visit per year; 16.9% vs. 22.1%. There was also a positive relationship between the number of risk factors and the percentage of patients with extractions. For patients with two or three risk factors, and smoking plus PerioPredict positive represented approximately 67% of those patients, two cleanings annually did not appear to be sufficient to control risk for tooth loss.

IL-1 genetic information may be used to target more intensive periodontitis management and prevention to those patients more likely to have a level of disease that influences the systemic inflammatory burden. In a recent analysis of insurance claims data from more than 300,000 patients, treatment of periodontitis was associated with subsequent reduced cost of medical care for those with selected chronic diseases, including type 2 diabetes, coronary artery disease, stroke, and adverse pregnancy outcomes. The annual per patient decrease in medical costs over the three years following periodontitis treatment were: \$2,840 for type 2 diabetes mellitus, \$5,681 for stroke, and \$1,090 for coronary artery disease (Jeffcoat et al. 2014).

The value of preventive dental care in reducing the cost of managing type 2 diabetes and its complications has been confirmed in a second study by United Healthcare and Optum, where claims data on more than 130,000 patients showed that regular preventive dental cleanings were associated with annual per patient cost decreases for diabetes management of \$2,045, compared to irregular preventive dental care, an annual mean per patient cost reduction of 20%.

### **Business Strategy**

We market PerioPredict to employers and insurance carriers as a central component to an enhanced benefit design or wellness initiative that is intended to lower medical costs through disease avoidance and reduced disease progression and complications.

We target large employers, who are typically self-insured, that see value in the potential reduction of medical costs associated with the highly prevalent inflammatory diseases that our program can provide. Within this customer segment, initial targets tend to be progressive, wellness-minded companies that are engaged in other programs aimed at improving the overall health of their employees.

We also target insurance carriers, with a particular emphasis on companies with dental-medical integration (DMI) products, either in place or in development, and integrated delivery networks (IDNs), as these customers are best positioned to realize value from the reduction of medical costs associated with the highly prevalent inflammatory diseases that our program can provide.

This target customer segment represents a large market, as an estimated 170 million Americans have dental coverage through an insurance program. These customers are increasingly focused on DMI products, as the correlation between oral health and general health has become better understood. We believe the potential of our PerioPredict program to facilitate the realization of cost savings through reduced medical claims is well-aligned with this powerful trend in the insurance industry.

Our insurance carrier customers are also seeking differentiation, and the opportunity to be seen as adding value to their customers through novel product offerings, such as benefit plans that include PerioPredict genetic testing. For these customers, we typically establish demonstration projects aimed at providing evidence of the efficacy of our program in driving patient engagement, compliance and ultimately reduced costs. Once that demonstration is achieved, we believe the insurance carrier will be incentivized to incorporate our program broadly in their product offerings, thereby providing significant leverage to our commercialization efforts.

To create further leverage, we intend to partner with channel partners, primarily benefits consulting firms, to identify, and facilitate initial interactions with, potential customers. We have established one such relationship at this point, with Employee Benefit Consulting Group LLC, or EBCG, a firm with expertise in the U.S. insurance market and strong relationships with employers, insurance carriers, and health and wellness providers. We work with EBCG to build awareness of PerioPredict as a tool for personalizing patient care among insurance carriers, benefit plans and employer groups, and to potentially incorporate the test in the design of risk-based benefit plans.

PerioPredict is solely available through Interleukin Genetics. The web site for the PerioPredict test is [www.PerioPredict.com](http://www.PerioPredict.com). The information contained on our websites are not incorporated by reference into this prospectus. We have included our website addresses only as an inactive textual reference and do not intend them to be active links to our websites.

## **Additional Products Marketed**

We market additional genetic tests through our Inherent Health brand:

*Weight Management Genetic Test:* This test determines whether individuals will lose weight more predictably on a low fat, low carbohydrate or balanced diet and whether normal or vigorous exercise is needed to most efficiently lose existing body fat. The test results guide more effective long-term weight loss.

*Bone Health Genetic Test:* This test is designed to identify whether an individual is more likely to be susceptible to spine fractures and low bone mineral density associated with osteoporosis.

*Heart Health Genetic Test:* This test is designed to identify genetic predisposition to excess inflammation, which is a risk factor for heart attack.

*Nutritional Needs Genetic Test:* This test is designed to identify DNA variations in genes crucial to B-vitamin metabolism and the ability to manage oxidative stress.

*Wellness Select Genetic Test:* This allows buyers to purchase any combination of Inherent Health genetic tests at a discounted price.

### *Weight Management Genetic Test*

Our Weight Management Genetic Test helps take the guesswork out of finding an effective diet and exercise solution by revealing actionable steps to achieve weight goals based on genetics. The test determines whether a low fat, low carbohydrate or balanced diet may be best, as well as whether normal or vigorous exercise is needed to most efficiently lose existing body fat. The test provides new information beyond traditional assessments, so that nutritional intake and fitness routines can be tailored for improved, sustainable results. This test identifies five SNPs in four human genes that are involved in certain physiological pathways relating to body weight. Certain patterns of markers are associated with differential response to certain diet and exercise regimens.

*Bone Health Genetic Test*

Our Bone Health Genetic Test is designed to identify whether an individual is more likely to develop spine fractures and low bone mineral density associated with osteoporosis. Although it typically starts later in life, early intervention can help prevent osteoporosis. Preventive measures can reduce the risk for bone loss and fractures, which in the case of vertebral fractures leads to a hunched over appearance. The test identifies a SNP in each of three genes involved in processes that affect bone; estrogen receptor alpha (ER1 Xba1), vitamin D receptor (VDR), and interleukin-1 (IL-1). Certain patterns of variations are associated with increased risk of spine fracture and/or low bone mineral density. The test can be used as an aid to making diet, exercise, and other lifestyle choices to maintain and improve bone health.

*Heart Health Genetic Test*

Our Heart Health Genetic Test is designed to identify genetic predisposition to excess inflammation, which is a risk factor for heart attack. The genetic analysis identifies individuals that have a lifelong tendency to overproduce certain chemicals in the body that lead to inflammation. Overproduction of these chemicals may start a chain reaction that ultimately may lead to a heart attack. Knowing genetic risk will enable individuals to take specific actions to decrease overall risk. The test identifies three SNPs in two genes involved in inflammation, IL-1 alpha and IL-1 beta. Certain IL-1 variations are associated with increased inflammation, which is a risk factor for early heart attack. The test may be used as an aid to making diet, exercise, and other lifestyle choices to reduce inflammation-based risk.

*Nutritional Needs Genetic Test*

Our Nutritional Needs Genetics Test is designed to identify DNA variations in genes crucial to B-vitamin metabolism and the ability to manage oxidative stress. Individuals with certain variations in these genes may be at increased risk for ineffective utilization of B-vitamins and potential for cell damage caused by oxidative stress, both of which can in some cases lead to increased risk for certain diseases. The test identifies the presence or absence of human genotypic markers involved in vitamin B metabolism and markers in response to oxidative stress. Certain variations are associated with less efficient B-vitamin metabolism or reduced activity of endogenous anti-oxidant systems. The test may be used to aid individuals in deciding whether to supplement their diet with B vitamins and/or antioxidants.

*Wellness Select Genetic Test*

Our Wellness Select Genetic Test allows buyers to purchase any combination of Inherent Health genetic tests at a discounted price.

#### *Marketing and Distribution of Inherent Health Tests*

We market our Inherent Health brand of genetic tests using our e-commerce website and under contract with Amway-affiliated companies, which are affiliates of Alticor, Inc., the parent of Pyxis Innovations Inc., a significant stockholder (“Pyxis”), and several regional weight management focused organizations. Amway sells the Inherent Health Weight Management test in the U.S. and fifteen countries in Europe. The European tests are processed through two European laboratories that have been validated for quality assurance purposes by Interleukin Genetics. We receive a royalty payment from each test processed in Europe but do not receive a test processing fee. We have developed a complete e-commerce solution for our Inherent Health brand of genetic tests. We have subcontracted with a fulfillment center to distribute tests to customers ordering via our online store. The e-commerce solution has provided a friendly and easy to use method for the purchase of our genetic tests. We are partnered with a number of websites that have established a link to our site in order to distribute tests. We pay these sites commissions for all orders made via a click through from their site to ours.

#### **Laboratory Testing Procedure**

To conduct a genetic risk assessment test, the customer collects cells from inside the cheek using a buccal swab brush and submits it by mail to our laboratory. Samples are processed only with a requisition signed by either a customer’s physician, one provided by an Interleukin Genetics physician or a patient’s dentist and a customer consent for the genetic test. Our CLIA-certified clinical laboratory performs the ordered genetic test using stringent standard operating protocols. Following state and country regulations the test results are provided directly to the customer and/or the designated health care provider.

We process test samples in our CLIA-certified genetic testing laboratory. The regulatory requirements associated with a CLIA-certified clinical laboratory are addressed under the section titled “Government Regulation.” We have upgraded the systems and processes for the laboratory with the addition of high volume analytical equipment as well as updated protocols for all of the laboratory processes. We currently hold laboratory permits or licenses for all US states that require a genetic test processing license and meet the regulatory requirements as needed for other countries.

## **Platform Extensions and Genetic Test Pipeline**

In addition to the genetic tests listed above that we currently market, we are also focusing our genetic test development efforts on the following programs:

### *Cardiovascular Disease: Use of IL-1 pro-inflammatory genetic variations to guide drug development and use to prevent secondary CVD events*

Inflammation is well documented to contribute to acute cardiovascular (CVD) events through biological effects on multiple components of the atherothrombotic cardiovascular disease process. Inflammatory biomarkers such as high-sensitivity C-reactive protein (hsCRP) identify individuals at high risk for both first and recurrent CVD events even in individuals without elevated lipid levels. We have previously reported that individuals with elevated oxidized phospholipids, as represented by Lp(a), are at increased risk for coronary artery atherosclerosis (Tsimikas et al. 2005), but the linear relationship was only present in individuals who tested positive for our pro-inflammatory IL-1 genetic patterns (Tsimikas et al. 2014). In addition, the combination of high Lp(a) levels and presence of the pro-inflammatory IL-1 genetic variations in one of our tests was predictive of which of those patients developed secondary CVD events in the next 4 years. The combination was significantly better than either factor alone and suggests that the bad lipids are working in part through the gene variations in our test.

In 2015, we announced a collaboration with Ionis Pharmaceuticals to use our IL-1 genetic test in a Phase 2 study of their anti-sense drug that has been shown in Phase 1 to reduce Lp(a) levels as well as to use our genetic test in a new Phase 1 study. Other companies are testing IL-1 blocking drugs for various indications, including Novartis, which is in current clinical trial of Canakinumab for secondary CVD events. We believe that our proprietary IL-1 genetic patterns that identify patients who over-produce IL-1 may have value in guiding development and use of drugs that directly or indirectly target IL-1 effects on CVD events.

### *Osteoarthritis*

Osteoarthritis, or OA, is the most common adult joint disease, increasing in frequency and severity in all aging populations. Considerable data provide support for a central role of interleukins in the pathogenesis of OA and genetic variations in the interleukin-1 gene cluster have been previously determined to be associated with multiple clinical phenotypes in OA. Our OA program centers on whether interleukin gene variations together with several other inflammatory gene variations is associated with the occurrence of multi-joint OA for the development of a genetic risk assessment test.

We have published findings on the genetics of OA in the *Annals of Rheumatic Diseases*, where we reported that a novel, patent-pending panel of genetic markers was highly predictive of which patients with knee OA were likely to develop severe disease as they age. The studies were done as a collaboration between Interleukin and New York University (NYU) Hospital for Joint Diseases, and this information may allow pharmaceutical companies that are developing the first disease-modifying OA drugs (DMOADs) to screen patients and include in their clinical trials only those patients who have progressive disease. In 2015, we signed a license agreement with NYU School of Medicine related to the development and commercialization of the first genetic test of its kind to identify individuals at increased risk for progression of OA and related complications.

## **Intellectual Property**

Our intellectual property is focused on the discoveries that link variations in key inflammation and metabolic genes to various conditions or illnesses. We initially concentrated our efforts on variations in the genes for the interleukin family of cytokines, because these compounds appear to be one of the strongest control points for the development and severity of inflammation. Some of our tests may include our proprietary genetic variations plus other gene variations that may be publicly available or in-licensed by Interleukin Genetics.

We have and have been granted patents and pending applications directed to single SNPs and SNP patterns in gene clusters as they relate to use for identifying individuals on a rapid path to several medical conditions or for use in guiding the selection of diets, exercise, vitamin needs, preventive care and also therapeutic agents. Groups of SNPs are often inherited together as patterns called haplotypes. We have a U.S. patent issued on haplotypes in an interleukin gene cluster and their biological and clinical significance. We believe these patents are controlling relative to interleukin SNPs and haplotype patterns that would be used for genetic risk assessment tests.

Our patents are “use” patents that claim that a SNP, or set of SNPs in unique patterns can be used in a novel way to predict disease development or progression, predict responses to preventive or therapeutic interventions and identify specific actions that improve health outcomes. We currently own rights in nine issued U.S. patents that have expiration dates between 2016 and 2029, six U.S. patent applications and one U.S. Provisional patent application pending, that are based on novel associations between particular gene sequences and certain metabolic and inflammatory conditions and disorders. The nine issued U.S. patents relate to genetic tests for, periodontal disease, osteoporosis, coronary artery disease, and other diseases associated with interleukin inflammatory haplotypes. Our newest patent applications relate to the commercial use of SNP panels in the fields of weight management, periodontal disease, osteoarthritis and IL-1 blocking drug indications. If granted, we expect many of these patents are not likely to expire until between 2028 and 2037.

Our intellectual property and proprietary technology are subject to numerous risks, which we discuss in “Risk Factors” below. Our commercial success will depend at least in part on our ability to obtain appropriate patent protection on our therapeutic and diagnostic products and methods and our ability to avoid infringing on the intellectual property of others.

We have been granted a number of corresponding foreign patents and have a number of foreign counterparts of our U.S. patents and patent applications pending.

## **Competition**

The competition in the field of personalized health is changing. The markets and customer base are not well established. There are a number of companies involved in identifying and commercializing genetic markers. The companies differ in product end points and target customers. There are companies that market individual condition genetic tests for complex diseases to consumers and those that sell only to physicians. There are companies that market testing services for rare monogenic diseases mainly to physicians. There are companies that sell genome-scanning services to provide customers (usually the consumer directly) reports on large numbers of SNPs or the person’s entire genome. There are also technology platform companies that sell SNP testing equipment.

The key competitive factors affecting the success of any genetic test is its perceived benefit by the user, price (potentially including availability of reimbursement) and the level of market acceptance. In the case of newly introduced products requiring “change of behavior” (such as genetic risk assessment tests), we believe the presence of multiple compet