VERMILLION, INC.
Form 424B3
May 13, 2015
Filed Pursuant to Rule 424(b)(3)
Registration No. 333-202032

PROSPECTUS

11,111,104 Shares of Common Stock

This prospectus relates to the possible resale of up to 11,111,104 shares of our common stock, $0.001 par value per share, which includes 4,166,659 shares of our common stock that may be issued upon the exercise of warrants, by the selling stockholders identified in this prospectus or in supplements to this prospectus. The shares and the warrants were issued to the selling stockholders in connection with a previously disclosed December 23, 2014 private placement. We are registering the shares to provide the selling stockholders with freely tradable securities. This prospectus does not necessarily mean that the selling stockholders will offer or sell those shares. Up to 6,944,445 shares may be sold from time to time after the effectiveness of the registration statement, of which this prospectus forms a part, and up to 4,166,659 shares may be sold from time to time after June 23, 2015, which is the date the warrants pursuant to which such shares may be issued become exercisable.

We will receive no proceeds from any sale by the selling stockholders of the shares of our common stock covered by this prospectus, but we have agreed to pay certain expenses relating to the registration of such shares. The selling stockholders may from time to time offer and resell, transfer or otherwise dispose of any or all of the shares of our common stock covered by this prospectus through underwriters or dealers, directly to purchasers or through broker-dealers or agents. See “Plan of Distribution.”

Our common stock is traded on The NASDAQ Capital Market under the symbol “VRML.” On May 6, 2015, the last reported sale price for our common stock on The NASDAQ Capital Market was $1.90 per share.

INVESTING IN OUR SECURITIES INVOLVES SUBSTANTIAL RISKS. YOU SHOULD CONSIDER THE RISK FACTORS BEGINNING ON PAGE 5 OF THIS PROSPECTUS, IN THE DOCUMENTS THAT ARE INCORPORATED BY REFERENCE INTO THIS PROSPECTUS AND, IF APPLICABLE, IN THE RISK FACTORS DESCRIBED IN ANY ACCOMPANYING PROSPECTUS SUPPLEMENT BEFORE BUYING ANY OF OUR SECURITIES.

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

The date of this prospectus is May 11, 2015.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission (the "SEC") using a shelf registration process. Under this shelf registration process, the selling stockholders may offer and resell, from time to time, up to 11,111,104 shares of our common stock, which includes 4,166,659 shares of our common stock that may be issued upon the exercise of warrants. We will not receive any of the proceeds from these sales, except that upon any exercise of the warrants, we will receive the exercise price of the warrants. We have agreed to pay certain expenses related to the registration of the shares of common stock pursuant to the registration statement of which this prospectus forms a part.

You should rely only on the information that we have provided or incorporated by reference in this prospectus, any applicable prospectus supplement and any related free writing prospectus that we may authorize to be provided to you. We have not authorized anyone to provide you with different information. No dealer, salesperson or other person is authorized to give any information or to represent anything not contained in this prospectus or any applicable prospectus supplement or any related free writing prospectus that we may authorize to be provided to you. If anyone provides you with different or inconsistent information, you should not rely on it. You should assume that the information in this prospectus, any applicable prospectus supplement or any related free writing prospectus is accurate only as of the date on the cover of the document and that any information we have incorporated by reference is accurate only as of the date of the document incorporated by reference, regardless of the time of delivery of this prospectus, any applicable prospectus supplement or any related free writing prospectus, or any sale of a security. Our business, financial condition, results of operations and prospects may have changed since those dates.

We urge you to carefully read this prospectus and any applicable prospectus supplement, together with the information incorporated herein by reference as described under the heading "Where You Can Find Additional Information."

PROSPECTUS SUMMARY

This summary highlights certain information contained in greater detail elsewhere in this prospectus or incorporated by reference into this prospectus. This summary is not complete and does not contain all of the information that you should consider before deciding whether to invest in our securities. You should carefully read this prospectus, any accompanying prospectus supplements, any related free writing prospectus that we have authorized for use in connection with this offering and the documents incorporated by reference herein and in any accompanying prospectus supplement, including the information referred to under the heading "Risk Factors" in this prospectus, under the heading "Risk Factors" contained in the applicable prospectus supplement and in the documents incorporated by reference into this prospectus and any prospectus supplement. Unless the context requires otherwise, all references in this prospectus to "Vermillion," "the Company," "we," "us," "our" or similar references mean Vermillion, Inc. together with its consolidated subsidiaries.

Our Company

Our vision is to drive the advancement of women's health by providing innovative methods to detect, monitor and manage the treatment of gynecologic disease – both benign and malignant cancers as well as other gynecologic diseases.

We have expanded our corporate strategy with the goal of transforming Vermillion from a technology license company to a diagnostic service and bio-analytic solutions provider. Our plan is to broaden our commercial focus from ovarian cancer to differential diagnosis of women with a range of gynecological disorders. Our strategy will be deployed in three phases. The three phases are a rebuild phase, which we expect to complete in the third quarter of 2015, a transformation phase, which is ongoing and is expected to span 2015, and a market expansion and growth phase, which we expect to begin in 2016.

During the first phase, we expanded our leadership team by hiring new heads of sales and customer experience, managed markets, marketing and operations, a chief information officer, a chief medical officer and a chief executive officer. In addition, we expanded our commercial strategy, reestablished medical and advisory support, rebuilt our patient advocacy strategy and established a billing system and a payer strategy outside of our relationship with Quest Diagnostics Incorporated ("Quest Diagnostics"). During the second phase, we plan to obtain licensure of ASPiRA LABS in all 50 states, establish our own payer coverage for OVA1 and launch a second-generation OVA1 test, known as OVA2 (predicated on receipt of approval from the United States Food and Drug Administration (the "FDA")). In the third phase we plan to commercialize OVA2 by utilizing the full national licensure of ASPiRA LABS, managed care coverage in select markets, our sales force and existing customer base. Unlike OVA1, OVA2 uses a global testing platform, which will allow OVA2 to be deployed internationally. We also plan to demonstrate proof of concept for a laboratory development test ("LDT") product series, which we refer to internally as OvaX. We anticipate that OvaX will include not only biomarkers, but also clinical risk factors and patient history data in order to boost predictive value.

We are dedicated to the discovery, development and commercialization of novel high-value diagnostic and bio-analytical solutions that help physicians diagnose, treat and improve outcomes for women. Our tests are intended to detect, characterize and stage disease, and to help guide decisions regarding patient treatment, which may include decisions to refer patients to specialists, to perform additional testing, or to assist in monitoring response to therapy. A distinctive feature of our approach is to combine multiple biomarkers, other modalities and diagnostics, clinical risk factors and patient data into a single, reportable index score that has higher diagnostic accuracy than its constituents. We concentrate our development of novel diagnostic tests for gynecologic disease, with an initial focus on ovarian cancer. We also intend to address clinical questions related to early disease detection, treatment response, monitoring of disease progression, prognosis and others through collaborations with leading academic and clinical research institutions.

Our lead product, OVA1, is a blood test designed to identify women who are at high risk of having a malignant ovarian tumor prior to surgery. The FDA cleared OVA1 in September 2009 and we commercially launched OVA1 in March 2010. We have completed development and validation work on a second-generation biomarker panel intended to maintain our product's high sensitivity while improving specificity. We submitted our 510(k) clearance application to the FDA on March 6, 2015, with the goal of commencing the marketing and sale of the panel in the second half of 2015. The product uses the Roche Cobas platform.

In June 2014, Vermillion launched ASPiRA LABS, a Clinical Laboratory Improvements Amendments of 1988 ("CLIA") certified national laboratory based near Austin, Texas, which specializes in applying biomarker-based technologies, to address critical needs in the management of gynecologic cancers. ASPiRA LABS provides expert diagnostic services using a state-of-the-art biomarker-based diagnostic algorithm to inform clinical decision making and advance personalized treatment plans. In addition, ASPiRA LABS seeks to serve as an educational and resource hub for healthcare professionals and women facing surgery for potentially-cancerous ovarian masses and other related gynecologic conditions. The lab currently processes our OVA1 test, and we expect the lab to process the CA 125-II test in the future in specific markets. We plan to expand the testing provided to other gynecologic conditions with high unmet need. We also plan to develop and perform LDTs at ASPiRA LABS. ASPiRA LABS currently holds a temporary CLIA Certificate of Registration and a state laboratory license in California, Florida and Rhode Island. ASPiRA LABS is in the process of obtaining a full Certificate of Accreditation and state laboratory licensure in New York, Maryland and Pennsylvania. The Centers for Medicare and Medicaid Services ("CMS") issued a provider number to ASPiRA LABS on March 5, 2015.

We are focused on the execution of four core strategic business drivers in ovarian cancer diagnostics to build long-term value for our investors:

- Maximizing the existing OVA1 opportunity in the United States by expanding our direct market reach beyond our current commercial agreement with Quest Diagnostics and taking the lead in payer coverage and commercialization of OVA1. This strategy includes the launch of a CLIA certified clinical laboratory, ASPiRA LABS, in June 2014;
- Improving OVA1 performance by seeking FDA clearance of a potentially better performing biomarker panel while migrating OVA1 to a global testing platform, thus allowing for better domestic market penetration and international expansion;
- Building an expanded patient base by launching a next generation multi-marker ovarian cancer test to monitor patients at risk for ovarian cancer; and
- Expanding our product offerings by adding additional gynecologic bio-analytic solutions involving biomarkers, other modalities (e.g., imaging), clinical risk factors and patient data to aid diagnosis and risk stratification of women presenting with pelvic mass disease.

We believe that these business drivers will contribute significantly to addressing unmet medical needs for women faced with gynecologic disease and other conditions and the continued development of our business.

Our Product

OVA1 addresses a clear clinical need, namely the pre-surgical identification of women who are at high risk of having a malignant ovarian tumor. Numerous studies have documented the benefit of referral of these women to gynecologic oncologists for their initial surgery. Prior to the clearance of OVA1, no blood test had been cleared by the FDA for physicians to use in the pre-surgical management of ovarian adnexal masses. OVA1 is a qualitative serum test that utilizes five well-established biomarkers and proprietary software cleared as part of the OVA1 510(k) to determine the likelihood of malignancy in women over age 18, with a pelvic mass for whom surgery is planned. OVA1 should not be used without an independent clinical/radiological evaluation and is not intended to be a screening test or to determine whether a patient should proceed to surgery. Incorrect use of OVA1 carries the risk of unnecessary testing, surgery and/or delayed diagnosis. OVA1 was developed through large pre-clinical studies in collaboration with numerous academic medical centers encompassing over 2,500 clinical samples. OVA1 was fully validated in a prospective multi-center clinical trial encompassing 27 sites reflective of the diverse nature of the clinical centers at which ovarian adnexal masses are evaluated.

In February 2013, results from a second pivotal clinical study of OVA1, called the "OVA500 study," led by Dr. Robert E. Bristow, Director of Gynecologic Oncology Services at University of California Irvine Healthcare, were published in Gynecologic Oncology. The study evaluated OVA1 diagnostic performance in a population of 494 evaluable patients who underwent surgery for an ovarian adnexal mass by a non-gynecologic oncologist. Since many professional medical societies stress the importance of multiple independent clinical trials as so-called "evidence levels," we also believe that the OVA500 study contributes to a higher evidence level relative to OVA1's utility in the medical management of adnexal masses.

In addition to these pivotal studies, three follow-on studies have been published bringing the number of full research articles on OVA1 clinical performance to a total of five peer-reviewed publications. Together, we believe these data provide strong clinical evidence that OVA1, in conjunction with the physician's independent clinical and radiological evaluation,

improves the pre-surgical detection of ovarian cancer, across all stages or subtypes, in patients undergoing surgery for a suspicious ovarian mass.

The American Medical Association Current Procedural Terminology ("CPT®") Panel approved a Category I CPT code (81503) for OVA1, which became effective in January 2013.

Dr. Bristow presented another study at the Society of Gynecological Oncology ("SGO") in March 2013 which was published in the journal Obstetrics &Gynecology (also known as the Green Journal) in June 2013. This study was based on the medical records of 13,321 women with ovarian epithelial cancer, the most common type of ovarian cancer, diagnosed from 1999 to 2006 in California. Only 37% of these patients received treatment that adhered to care guidelines set by the National Comprehensive Cancer Network ("NCCN"), an alliance of 23 major cancer centers with expert panels that analyze, research and recommend cancer treatments. The study found that surgeons who operated on 10 or more women per year for ovarian cancer, and hospitals that treated 20 or more women a year for ovarian cancer, were more likely to adhere to NCCN guidelines and their patients lived longer. Among women with advanced disease — the stage at which ovarian cancer is usually first found — 35% survived at least five years if their care met the guidelines, compared with 25% of those whose care fell short.

In May 2013, the SGO issued a position statement on OVA1. This second SGO statement on OVA1 since its FDA clearance in 2009 represents another significant step toward acceptance of OVA1 as the standard of care for pre-surgically evaluating the risk of ovarian cancer in women with adnexal masses. The statement, titled "Multiplex Serum Testing for Women with Pelvic Mass," reads:

"Blood levels of five proteins in women with a known ovarian mass have been reported to change when ovarian cancer is present. Tests measuring these proteins may be useful in identifying women who should be referred to a gynecologic oncologist. Recent data have suggested that such tests, along with physician clinical assessment, may improve detection rates of malignancies among women with pelvic masses planning surgery. [1],[2] Results from such tests should not be interpreted independently, nor be used in place of a physician's clinical assessment. Physicians are strongly encouraged to reference the American Congress of Obstetricians and Gynecologists' ("ACOG") 2011 Committee Opinion "The Role of the Obstetrician-Gynecologist in the Early Detection of Epithelial Ovarian Cancer" to determine an appropriate care plan for their patients. It is important to note that no such test has been evaluated for use as, nor cleared by, the FDA as a screening tool for ovarian cancer. SGO does not formally endorse or promote any specific products or brands."

[1] Bristow RE, Smith A, Zhang Z, Chan DW, Crutcher G, Fung ET, et al. Ovarian malignancy risk stratification of the adnexal mass using a multivariate index assay. Gynecol Oncol 2013;128: 252–259.

[2] Ueland FR, Desimone CP, Seamon LG, Miller RA, Goodrich S, Podzielinski I, et al. Effectiveness of a multivariate index assay in the preoperative assessment of ovarian tumors. Obstet Gynecol 2011;117:1289-1297.

We believe the position statement does two things:

- Lists as references the publications of OVA1's two pivotal clinical studies, comprised of the original FDA validation study published in June 2011 and the OVA500 "intended use" study published in 2013. Together, this offers an extensive, peer-reviewed proof source for physicians and payers to assess OVA1's clinical performance and comparative medical benefits versus today's standard of care.
- Places OVA1 use in the context of current ACOG practice guidelines, where CA125 has been used off-label for many years to predict malignancy before surgery, although with inferior performance as compared to OVA 1.

A study published in July 2014 in The American Journal of Obstetrics & Gynecology examined the relationship between two imaging methods, ultrasound and computed tomography ("CT"), and the OVA1 test result in assessing the risk of ovarian cancer among patients planning surgery for an ovarian mass. Using data obtained from 1,100 ovarian mass surgery patients in two previous pivotal trials of OVA1's clinical performance, conducted in 2007 and 2012, the study found that adding OVA1 reduced the number of ovarian cancers missed with imaging alone by 84-90%. Specifically, ultrasound alone missed 23.1% of ovarian cancers that were presented but when OVA1 was added in parallel, the number of ovarian cancers missed decreased to 2.2%. When CT was used alone, 20.2% of ovarian cancers were missed, but this rate fell to 2.9% when OVA1 was added in parallel. Additionally, the study found when ultrasound and OVA1 were combined in parallel, 95% of ovarian cancers in a subgroup of early-stage patients were detected.

Novitas Solutions (formerly Highmark Medicare Services), a Medicare contractor, covers and reimburses for OVA1. In December 2013, the Centers for Medicare and Medicaid Services ("CMS") made its final determination and authorized Medicare contractors to set prices for Multianalyte Assays with Algorithmic Analyses ("MAAA") test CPT codes when they determine it is payable. CMS also validated that an algorithm has unique value by specifying that the gap-fill process and not cross-walk should be used by contractors to price MAAA tests. We expect OVA1 to be priced using the gap-fill method. We will be engaged in that process in 2015 for pricing effective January 1, 2016. This decision also sets a precedent for recognizing the value of biomarker developed tests to clinical decision-making and healthcare efficiencies.

We terminated our Strategic Alliance Agreement with Quest Diagnostics (the "Strategic Alliance Agreement") in August 2013. Prior to the termination of the Strategic Alliance Agreement, Quest Diagnostics had the right to be the exclusive clinical reference laboratory marketplace provider of OVA1 tests in its exclusive territory, which included the United States, Mexico, the United Kingdom and India. As part of the termination, we agreed that Quest Diagnostics could continue to make OVA1 available to healthcare providers under legacy financial terms following the termination while negotiating in good faith towards an alternative business structure. Quest Diagnostics disputed the effectiveness of such termination.

As a result of ongoing negotiations, on March 11, 2015, we reached a settlement agreement with Quest Diagnostics that terminated all disputes related to our prior strategic alliance and loan agreements with Quest Diagnostics. We also entered into a new commercial agreement with Quest Diagnostics. Pursuant to this agreement, Vermillion's wholly-owned subsidiary, ASPiRA LABS, will begin to offer OVA1 testing to Quest Diagnostics customers. We expect Quest Diagnostics to transfer all OVA1 U.S. testing services to ASPiRA LABS, starting with 49 states this year, while continuing to provide blood draw and logistics support by transporting specimens from its clients to ASPiRA LABS for testing for a period of two years from the date of the agreement. Pursuant to the agreement, Quest Diagnostics will also continue to offer OVA1 services through its own labs in the remaining state, until ASPiRA LABS has obtained the state approvals required to provide those services. Quest Diagnostics will receive a fee for collection and logistic support services it provides. Per the terms of the agreement, we will not offer to existing or future Quest Diagnostics customers CA 125-II or other tests that Quest Diagnostics offers.

On March 27, 2015, initial results from a cost-effectiveness analysis study were presented at the Annual Meeting of the American College of Medical Quality in Alexandria, Virginia. The study was co-authored by Dr. Robert E. Bristow and Dr. Gareth K. Forde, clinicians at the University of California at Irvine ("UC Irvine"), and Dr. John Hornberger, a leading health economist at Stanford University School of Medicine. This new study, entitled: "Cost Effectiveness Analysis of a Multivariate Index Assay compared to Modified ACOG Criteria and CA-125 in the Triage of Women with Adnexal Masses", further establishes important advantages that OVA1 may provide in the detection, triage and cost-effective management of ovarian cancer.

The study compared clinical outcomes and costs using OVA1 versus the off-label but commonly used CA-125 ("CA 125-II"), an ovarian cancer biomarker, or current gynecologic best-practice care known as Dearking-modified ACOG guidelines ("mod-ACOG"). Model endpoints included overall survival, costs, quality-adjusted life years ("QALY") and incremental cost effectiveness ratio. The analysis considered a lifetime horizon from the standpoint of a public payer (using Medicare reimbursement rates) and an accepted cost-effectiveness threshold of $50,000 per QALY.

Several important health economic and quality outcomes conclusions were reported in the new study:

- Use of OVA1 resulted in fewer projected re-operations and pre-treatment CT scans versus CA 125-II or mod-ACOG,
- OVA1 was QALY-increasing and cost-effective relative to CA 125-II or mod-ACOG,
- ICERs of $12,189/QALY and $35,094/QALY were calculated for OVA1 versus CA 125-II and mod-ACOG, respectively, resulting in a “cost-effective” outcome based on the $50,000 threshold, and
- Relative to the best-practice mod-ACOG benchmark, OVA1 projected an annual increase in patient survival and QALY in excess of 1,000 years, when the surgical cohort was projected to national annual adnexal mass surgeries including about 22,000 new cases of ovarian cancer.

On April 14, 2015, we announced the initiation of a strategic collaboration with Kaiser Permanente's Southern California Permanente Medical Group in order to enhance the diagnosis and treatment of ovarian cancer. The ultimate goal of

this collaboration is to create a "best practice" for identification and "first time right" treatment of patients with ovarian cancer.

Corporate Information

We were originally incorporated in 1993, and we had our initial public offering in 2000. Our executive offices are located at 12117 Bee Caves Road, Building Three, Suite 100, Austin, Texas 78759, and our telephone number is (512) 519-0400. We maintain a website at www.vermillion.com and www.aspiralab.com where general information about us is available. Our websites, and the information contained therein, are not a part of this prospectus.

Description of the Private Placement

On December 23, 2014, we completed a private placement (the “private placement”) of an aggregate of 6,944,445 shares of our common stock and warrants to purchase an aggregate of 4,166,659 shares of our common stock (the “warrants”) to the selling stockholders in reliance on an exemption to registration afforded by Section 4(a)(2) of the Securities Act of 1933, as amended (the “Securities Act”), and rules promulgated thereunder. Each of the selling stockholders is either a “qualified institutional buyer” as defined in Rule 144A(a) under the Securities Act or an “accredited investor” as defined in Rule 501(a) under the Securities Act. In accordance with the registration rights we granted in the securities purchase agreement entered into in connection with the private placement, we are registering for resale by the selling stockholders the shares of our common stock issued in the private placement and the shares of our common stock that may be issued upon exercise of the warrants issued in the private placement.

The shares were sold at a price of $1.44 per share, being the closing price per share of our common stock on the NASDAQ Capital Market on December 18, 2014, for an aggregate purchase price of $10.0 million. The warrants were sold at a price of $0.125 per warrant, for an aggregate purchase price of $0.5 million, and each warrant may be exercised for a purchase price equal to $2.00 per share of our common stock, subject to customary anti-dilution adjustments. The warrants may be exercised from time to time beginning on June 23, 2015, and the warrants expire on December 23, 2017. The terms of certain of the warrants prohibit the holder of such warrants from exercising the warrants to the extent that the exercise would result in the holder beneficially owning more than 19.99% of the outstanding shares of our common stock.

The Offering

Securities Offered by the Selling Stockholders	Up to 11,111,104 shares of common stock
Common Stock Outstanding	43,115,790 shares (1)
Terms of the Offering	The selling stockholders may from time to time offer and resell, transfer or otherwise dispose of any or all of the shares of our common stock covered by this prospectus through underwriters or dealers, directly to purchasers or through broker-dealers or agents. See “Plan of Distribution.”
Use of Proceeds	We will not receive any of the proceeds from the sale of the shares of common stock being offered under this prospectus. We may receive proceeds from the exercise of the warrants to

	purchase our common stock, and we would use such proceeds primarily for working capital and general corporate purposes. See “Use of Proceeds.”
NASDAQ Capital Market Symbol	VRML

Risk Factors	You should read the "Risk Factors" section of this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our common stock.

(1) Based upon the total number of issued and outstanding shares as of May 1, 2015. Excludes the 4,166,659 shares of our common stock that may be issued upon the exercise of the warrants held by the selling stockholders.

RISK FACTORS

Investing in our securities involves a high degree of risk. Please carefully consider the risk factors described in our most recent Annual Report on Form 10-K, any subsequent updates in our Quarterly Reports on Form 10-Q and any other filings we make with the SEC pursuant to Section 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), incorporated by reference herein, before making an investment decision. Additional risk factors may be included in any prospectus supplements relating to securities described in this prospectus. The occurrence of any of those risks could materially and adversely affect our business, prospects, financial condition, results of operations or cash flow. Other risks and uncertainties that we do not now consider to be material or of which we are not now aware may become important factors that affect us in the future and could result in a complete loss of your investment.

DISCLOSURE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, any prospectus supplement and the documents that we incorporate herein or therein by reference contain forward-looking statements, as defined in the Private Securities Litigation Reform Act of 1995. These statements involve a number of risks and uncertainties. Words such as “may,” “expects,” “intends,” “anticipates,” “believes,” “estimates,” “plans,” “seeks,” “could,” “should,” “continue,” “will,” “potential,” “projects” and similar expressions are intende identify such forward-looking statements. Readers are cautioned that these forward-looking statements speak only as of the date on which the document in which they appear is filed with the SEC, and, except as required by law, we do not assume any obligation to update, amend or clarify them to reflect events, new information or circumstances occurring after such dates.

Examples of language found in forward-looking statements include the following:

- projections or expectations regarding our future revenue, results of operations and financial condition;
- our plan to broaden our commercial focus from ovarian cancer to differential diagnosis of women with a range of gynecological disorders;
- intentions to address clinical questions related to early disease detection, treatment response, monitoring of disease progression, prognosis and other issues in the fields of oncology and women’s health;
- anticipated efficacy of our products, product development activities and product innovations;
- plans with respect to ASPiRA LABS, including obtaining state licensure;
- plans with respect to OVA2 and OvaX;
- plans to develop and implement LDTs at ASPiRA LABS;
- expectations regarding existing and future collaborations and partnerships;
- achieving milestones in product development and pending regulatory submissions;
- our ability to commercialize OVA1 in other countries;
- anticipated future losses and our ability to continue as a going concern;
- expected levels of expenditures;
- expected market adoption of our diagnostic tests, including OVA1;
- the amount of financing anticipated to be required to fund our planned operations;
- the financial or market share projections which could result from positive guidelines or position statements; and
- our expected reimbursement for our products, and our ability to obtain such reimbursement, from third-party payers such as private insurance companies and government insurance plans.

These statements involve estimates, assumptions and uncertainties that could cause actual results to differ materially from those expressed in them. Any forward-looking statements are qualified in their entirety by reference to the risk factors described in any accompanying prospectus supplement or in any document incorporated by reference into this prospectus.

These factors include, among others:

- our ability to increase the volume of OVA1 sales;
- our ability to market our test through sales channels other than Quest Diagnostics, including ASPiRA LABS;
- uncertainty in how we recognize future revenue following termination of the Quest Diagnostics Strategic Alliance Agreement;
- failures by third-party payers to reimburse OVA1 or changes or variances in reimbursement rates;
- our ability to secure additional capital on acceptable terms to execute our business plan;
- our ability to commercialize OVA1 outside the United States;

- in the event that we succeed in commercializing OVA1 outside the United States, the political, economic and other conditions affecting other countries (including foreign exchange rates);
- our ability to develop and commercialize additional diagnostic products and achieve market acceptance with

respect to these products;

- our ability to compete successfully;
- our ability to obtain any regulatory approval required for our future diagnostic products;
- our or our suppliers' ability to comply with FDA requirements for production, marketing and post-market monitoring of our products;
- our ability to maintain sufficient or acceptable supplies of immunoassay kits from our suppliers;
- our ability to continue to develop, protect and promote our proprietary technologies;
- future litigation against us, including infringement of intellectual property and product liability exposure;
- our ability to retain key employees;
- business interruptions;
- legislative actions resulting in higher compliance costs;
- changes in healthcare policy;
- our ability to comply with environmental laws;
- our ability to generate sufficient demand for ASPiRA LABS' services to cover its operating costs;
- our ability to comply with the additional laws and regulations that apply to us in connection with the operation of ASPiRA LABS;
- our ability to obtain any FDA clearance or approval required to develop and perform LDTs;
- the potentially low liquidity and trading volume of our common stock and concentration in the ownership of our common stock;
- volatility in the price of our common stock;
- the existence of anti-takeover provisions in our corporate governance documents;
- actions of activist stockholders;
- that we do not intend to pay dividends, so our stockholders will benefit from an investment in our capital stock only if it appreciates in value; and
- potential dilution caused by future sale of our common stock or other securities to meet our capital requirements.

You should read this prospectus, any accompanying prospectus supplement, any related free writing prospectus and the documents that we incorporate by reference herein and therein completely and with the understanding that our actual future results may be materially different from what we currently expect. You should not put undue reliance on any forward-looking statement. We believe it is important to communicate our expectations to our investors. However, there may be events in the future that we are not able to accurately predict or that we do not fully control that could cause actual results to differ materially from those expressed or implied in our forward-looking statements.

USE OF PROCEEDS

All of the shares of common stock offered by the selling stockholders pursuant to this prospectus will be sold by the selling stockholders for their accounts. We will not receive any of the proceeds from these sales, if any. A portion of the shares covered by this prospectus may be issued upon exercise of warrants to purchase our common stock. Upon any exercise of the warrants, the selling stockholder would pay us the exercise price of the warrants, and we would use such proceeds primarily for working capital and general corporate purposes. We will pay all of the fees and expenses incurred by us in connection with this registration. We will not be responsible for fees and expenses incurred by the selling stockholders or any underwriting discounts or commissions.

PLAN OF DISTRIBUTION

The selling stockholders and any of their pledgees, assignees and successors-in-interest may, from time to time, sell any or all of the shares of our common stock beneficially owned by them and offered hereby directly or through one or more underwriters, broker-dealers or agents. The selling stockholders will be responsible for any underwriting discounts or agent's commissions. The common stock may be sold in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices. The selling stockholders may sell shares using any one or more of the following methods:

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

The selling stockholders also may sell shares under Rule 144 promulgated under the Securities Act rather than under this prospectus or any related prospectus supplement.

In connection with the sale of our common stock or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of our common stock in the course of hedging the positions they assume. The selling stockholders may also sell our common stock short and deliver these shares of our common stock to close out their short positions, or loan or pledge our common stock to broker-dealers that in turn may sell our common stock. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or create one or more derivative securities that require the delivery to such broker-dealer or other financial institution of the shares of our common stock covered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The selling stockholders and any broker-dealers or agents that are involved in selling the shares may be deemed to be "underwriters" within the meaning of the Securities Act in connection with such sales. In such event, any compensation

received by such broker-dealers or agents and any profit on the resale of the shares purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. While neither we nor any selling stockholder can presently estimate the amount of such compensation, in compliance with the guidelines of the Financial Industry Regulatory Authority, Inc. (“FINRA”), the aggregate maximum discount, commission,

agency fees or other items constituting underwriting compensation to be received by any FINRA member or independent broker-dealer will not exceed 8% of any offering pursuant to this prospectus and any related prospectus supplement. However, it is anticipated that the maximum commission or discount to be received in any particular offering of securities will be less than this amount.

Because selling stockholders may be deemed to be "underwriters" within the meaning of Section 2(a)(11) of the Securities Act, the selling stockholders will be subject to the prospectus delivery requirements of the Securities Act, which may include delivery through the facilities of NASDAQ pursuant to Rule 153 under the Securities Act.

We have agreed to indemnify certain of the selling stockholders against certain liabilities, including liabilities arising under the Securities Act. The selling stockholders may agree to indemnify any agent, dealer or broker-dealer that participates in transactions involving sales of shares of common stock against certain liabilities, including liabilities arising under the Securities Act.

The shares of common stock covered by this prospectus will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the shares of common stock covered hereby may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Under applicable rules and regulations under the Exchange Act, any person engaged in the distribution of the shares of common stock covered hereby may not simultaneously engage in market making activities with respect to the common stock for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the selling stockholders will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of the common stock by the selling stockholders or any other person. We will make copies of this prospectus available to the selling stockholders and have informed them of the need to deliver a copy of this prospectus to each purchaser at or prior to the time of the sale (including by compliance with Rule 172 under the Securities Act).

Each selling stockholder has informed the Company that it does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the shares of our common stock covered by this prospectus. Upon being notified by a selling stockholder that any material arrangement has been entered into with a broker-dealer or underwriter for the sale of shares of common stock through a block trade, special offering, exchange distribution or secondary distribution or a purchase by a broker or dealer, we will file a supplement to this prospectus, if required, pursuant to Rule 424(b) under the Securities Act, disclosing (i) the name of each such selling stockholder and of the participating broker-dealer(s) or underwriter(s), (ii) the number of shares of common stock involved, (iii) the price at which such shares were or will be sold, (iv) the commissions paid or to be paid or discounts or concessions allowed to such broker-dealer(s) or underwriter(s), where applicable, (v) that, as applicable, such broker-dealer(s) or underwriter(s) did not conduct any investigation to verify the information set out or incorporated by reference in this prospectus and (iv) other facts material to the transaction.

With certain exceptions, we have agreed to use commercially reasonable efforts to keep this prospectus effective until the later of December 23, 2016, the date by which all the shares of common stock covered by this prospectus may be sold without volume or manner of sale restrictions which may be applicable to affiliates under Rule 144 or the date by which all the shares covered by this prospectus are sold. There can be no assurance that the selling stockholders will sell any or all of the shares of common stock registered pursuant to the registration statement of which this prospectus or any related prospectus supplement forms a part.

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DESCRIPTION OF CAPITAL STOCK

The following summary description of our capital stock is based on the applicable provisions of the Delaware General Corporation Law (the "DGCL"), and on the provisions of our Fourth Amended and Restated Certificate of Incorporation, dated January 22, 2010, as amended effective June 19, 2014 (our "Certificate of Incorporation"), and our Fifth Amended and Restated Bylaws, effective June 19, 2014 (our "Bylaws"). This information is qualified entirely by reference to the applicable provisions of the DGCL, our Certificate of Incorporation, and our Bylaws. For information on how to obtain copies of our Certificate of Incorporation and our Bylaws, please refer to the heading "Where You Can Find More Information" in this prospectus.

Our Authorized Capital Stock

Under our Certificate of Incorporation, our authorized capital stock consists of 150,000,000 shares of common stock, par value $0.001 per share, and 5,000,000 shares of preferred stock, par value $0.001 per share.

Common Stock

As of May 1, 2015, we had 43,115,790 shares of our common stock outstanding, 2,411,569 shares of our common stock that were subject to outstanding options and 36,911 shares of our common stock reserved for future issuance to employees, directors and consultants pursuant to our stock incentive plans. In addition, as of May 1, 2015, warrants to purchase 4,629,018 shares of our common stock were outstanding at exercise prices ranging from $1.46 to $4.70 per share, with a weighted average exercise price of $1.96 per share. The rights, preferences and privileges of the holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock which we may designate in the future.

Voting Rights

Each holder of common stock is entitled to one vote for each share on all matters to be voted upon by the stockholders, and there are no cumulative voting rights.

Dividend Rights

Subject to preferences to which holders of preferred stock may be entitled and the rights of certain of our stockholders set forth in the Stockholders Agreement (as defined below), holders of common stock are entitled to receive ratably such dividends, if any, as may be declared from time to time by our Board of Directors out of funds legally available therefor. We have never paid or declared any dividend on our common stock, and we do not anticipate paying cash dividends on any common stock in the foreseeable future. We intend to retain all available funds and any future earnings to fund the development and expansion of our business.

No Preemptive or Similar Rights

Holders of our common stock do not have preemptive rights, and our common stock is not convertible or redeemable. As described under "Stockholders Agreement," certain holders of our common stock have the right to purchase shares in connection with most equity offerings made by the Company.

Right to Receive Liquidation Distributions

In the event of our liquidation, dissolution or winding up, holders of common stock would be entitled to share in our assets remaining after the payment of liabilities and the satisfaction of any liquidation preference granted the

holders of any outstanding shares of any senior class of securities. The rights, preferences and privileges of the holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock which we may designate in the future.

Preferred Stock

There are no shares of our preferred stock outstanding.

Our Board of Directors is authorized, subject to any limitations prescribed by law, without stockholder approval, to issue from time to time up to an aggregate of 5,000,000 shares of preferred stock, in one or more series, each of such series to have such rights and preferences, including voting rights, dividend rights, conversion rights, redemption terms and liquidation preferences as shall be determined by our Board of Directors. Any issuance of shares of preferred stock could adversely affect the voting power of holders of common stock, and the likelihood that the holders of preferred stock will receive dividend payments and payments upon liquidation could have the effect of delaying, deferring or preventing a change in control.

Stockholders Agreement

In connection with a private placement in May 2013, we entered into a stockholders agreement with the purchasers named therein (the "Stockholders Agreement"). Pursuant to and subject to the terms of the Stockholders Agreement, certain of the investors received rights to participate in any future equity offerings on the same price and terms as other investors, and rights to exercise piggyback registration rights for any registration statements that we file prior to May 13, 2018 on our own account or for the account of others with respect to shares of our common stock.

In addition, the Stockholders Agreement prohibits the Company from taking material actions without the consent of at least one of the two primary investors. These material actions include:

- making any acquisition with value greater than $2 million;
- entering into, or amending the terms of agreements with Quest Diagnostics, provided that such investors consent shall not be unreasonably withheld, conditioned or delayed following good faith consultation with the Company;
- submitting any resolution at a meeting of stockholders or in any other manner changing or authorizing a change in the size of our Board of Directors;
- offering, selling or issuing any securities senior to our common stock or any securities that are convertible into or exchangeable or exercisable for securities ranking senior to our common stock;
- amending our Certificate of Incorporation or our Bylaws in any manner that affects the rights, privileges or economics of our common stock or the warrants purchased in the May 2013 private placement;
- taking any action that would result in a change in control of Vermillion or an insolvency event;
- paying or declaring dividends on any securities of the Company or distributing any assets of the Company other than in the ordinary course of business or repurchasing any outstanding securities of the Company; or
- adopting or amending any stockholder rights plan.

In addition, the two primary investors (Jack W. Schuler, on the one hand, and Oracle Partners, LP and Oracle Ten Fund Master, LP, on the other hand) each received the right to designate a person to serve on our Board of Directors. These rights terminate for each investor when that investor ceases to beneficially own less than 50% of the shares and warrants (taking into account shares issued upon exercise of the warrants), in the aggregate, that it purchased at the closing of our May 2013 private placement.

Section 203 of the Delaware Corporation Law

We are subject to Section 203 of the DGCL, which prevents an interested stockholder (defined in Section 203 of the DGCL, generally, as a person owning 15% or more of a corporation's outstanding voting stock), from engaging in a business combination (as defined in Section 203 of the DGCL) with a publicly-held Delaware corporation for three years following the date such person became an interested stockholder, unless:

- before such person became an interested stockholder, the board of directors of the corporation approved the transaction in which the interested stockholder became an interested stockholder or approved the business combination;
- upon consummation of the transaction that resulted in the interested stockholders becoming an interested stockholder, the interested stockholder owns at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced (excluding stock held by directors who are also officers of the corporation and by employee stock plans that do not provide employees with the rights to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer); or
- following the transaction in which such person became an interested stockholder, the business combination is approved by the board of directors of the corporation and authorized at a meeting of stockholders by the affirmative vote of the holders of two-thirds of the outstanding voting stock of the corporation not owned by the interested stockholder.

The provisions of Section 203 of the DGCL could make a takeover of the Company difficult.

Effect of Certain Provisions of Our Certificate of Incorporation and Bylaws

Certain provisions of our Certificate of Incorporation and Bylaws may have the effect of making it more difficult for a third party to acquire, or of discouraging a third party from attempting to acquire, control of us. Such provisions could limit the price that certain investors might be willing to pay in the future for our securities. Our Certificate of Incorporation eliminates the right of stockholders to call special meetings of stockholders or to act by written consent without a meeting, and our Bylaws require advance notice for stockholder proposals and director nominations, which may preclude stockholders from bringing matters before an annual meeting of stockholders or from making nominations for directors at an annual meeting of stockholders. Our Certificate of Incorporation authorizes undesignated preferred stock, which makes it possible for our Board of Directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to change control of us.

These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of us. The amendment of any of the provisions of our Certificate of Incorporation described in the immediately preceding paragraph would require approval by our Board of Directors and the affirmative vote of at least 66 2/3% of our then outstanding voting securities, and the amendment of any of the provisions of our Bylaws described in the immediately preceding paragraph would require approval by our Board of Directors or the affirmative vote of at least 66 2/3% of our then outstanding voting securities.

Transfer Agent

The transfer agent for our common stock is Wells Fargo Shareowner Services.

Listing

Our common stock is listed on The NASDAQ Capital Market under the symbol "VRML."

SELLING STOCKHOLDERS

The “selling stockholders” named in this prospectus may sell shares of our common stock registered pursuant to the registration statement of which this prospectus is a part. This prospectus covers the resale of 11,111,104 shares of our common stock, including 4,166,659 shares of our common stock that may be issued upon the exercise of warrants, issued to the selling stockholders named in this prospectus in connection with our previously disclosed December 23, 2014 private placement. The selling stockholders are not required to offer any of the shares of our common stock covered by this prospectus for resale. Since the selling stockholders may sell all, some or none of their shares, and may or may not exercise any or all of the warrants, we cannot estimate with precision the aggregate number of shares that the selling stockholders will offer pursuant to this prospectus or that the selling stockholders will own upon completion of the offering to which this prospectus relates.

Information about additional selling stockholders may be set forth in a prospectus supplement, in a post-effective amendment or in filings that we make with the SEC under the Exchange Act, which are incorporated by reference in this prospectus.

Each selling stockholder that sells shares of common stock pursuant to this prospectus may be deemed to be an “underwriter” within the meaning of the Securities Act. Any commissions received by a broker or dealer in connection with resales of our common stock may be deemed to be underwriting commissions or discounts under the Securities Act.

The following table sets forth information with respect to our common stock beneficially owned by the selling stockholders as of May 1, 2015:

	Shares Beneficially Owned Prior to Resale(1)				Shares Beneficially Owned After Resale(2)	
Name of Selling Stockholder	#	%	Shares Offered for Resale	Warrant Shares Offered for Resale	#	%
James T. LaFrance (3)	251,518	*	16,502	9,901	225,115	*
Robert S. Goggin, III (4)	283,289	*	66,007	39,604	177,678	*
Peter S. Roddy (4)	131,713	*	16,502	9,901	105,310	*
Carl Severinghaus (4)	146,995	*	16,502	9,901	120,592	*
The Seamark Fund L.P. (5)	1,496,396	3.5 %	200,000	120,000	1,176,396	2.7 %

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Oracle Institutional Partners, L.P. (6)	1,555,555	3.6 %	972,222	583,333	—	*
Tino Hans Schuler Trust (7)	2,359,238	5.4 %	952,838	571,702	834,698	1.9%
Tanya Eve Schuler Trust (7)	2,359,238	5.4 %	952,838	571,702	834,698	1.9%
Therese Heidi Schuler Trust (7)	2,359,238	5.4 %	952,838	571,702	834,698	1.9%
Schuler GC 2010 Continuation Trust (7)	302,220	*	188,888	113,332	—	*
Schuler Grandchildren LLC (7)	302,220	*	188,888	113,332	—	*
Jack W. Schuler Living Trust (8)	2,061,342	4.7 %	1,288,339	773,003	—	*
Feinberg Family Trust (9)	1,638,777	3.8 %	173,611	104,166	1,361,000	3.1 %
Vaughn Bryson	105,609	*	66,006	39,603	—	*
Birchview Fund LLC (10)	1,111,110	2.6 %	694,444	416,666	—	*
Paul and Carolyn Clark Revocable Trust of 2009 (11)	264,027	*	165,017	99,010	—	*
Michael A. Gordon	175,663	*	33,003	19,801	122,859	*
Total			6,944,445	4,166,659		

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* Represents less than 1%.

(1) Based on 43,115,790 shares of our common stock outstanding as of May 1, 2015. In addition, shares underlying options vesting within 60 days of May 1, 2015 are deemed outstanding for the purpose of computing the percentage ownership of the person or persons holding such options, but are not deemed outstanding for computing the percentage ownership of any other persons. Shares issuable upon the exercise of the warrants listed in the table above are deemed outstanding for the purpose of computing the percentage

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ownership of the person or persons holding such warrants because such warrants are exercisable within 60 days of May 1, 2015, but are not deemed outstanding for computing the percentage ownership of any other persons. Unless otherwise indicated, the ownership information provided in the table above and the related footnotes is based upon information provided to the Company by each selling stockholder.

(2) Assumes that the selling stockholders will sell all of the shares of common stock saleable pursuant to this prospectus, including shares of common stock that may be issued upon the exercise of the warrants. Assumes for each selling stockholder that (a) only such selling stockholder's warrants were exercised and (b) as a consequence the number of issued and outstanding shares has increased by the number of such selling stockholder's warrant shares. The registration of these shares does not necessarily mean that the selling stockholders will sell all or any portion of the shares covered by this prospectus.

(3) Includes 147,093 shares underlying options exercisable within 60 days of May 1, 2015. Mr. LaFrance is the Chairman of our Board of Directors and served as President and Chief Executive Officer of the Company from April 23, 2014 to December 31, 2014.

(4)Messrs. Goggin, Roddy and Severinghaus are members of our Board of Directors.

(5) Includes 223,000 shares underlying warrants exercisable within 60 days of May 1, 2015. John D. Fraser, and David T. Harrington, co-the Managing Partner of The Seamark Fund L.P., have voting and investment control over the shares.

(6)Based on the information provided in Amendment No. 4 to Schedule 13D filed with the SEC on April 24, 2015 by Larry N. Feinberg with respect to himself, Oracle Associates, LLC ("Oracle Associates"), Oracle Partners, L.P. ("Oracle Partners"), Oracle Investment Management, Inc. ("Investment Manager"), Oracle Ten Fund Master, L.P. ("Ten Fund") and Oracle Institutional Partners, L.P. ("Institutional Partners") (Mr. Feinberg, together with Oracle Associates, Oracle Partners, Investment Manager, Ten Fund and Institutional Partners, the "Oracle Reporting Persons"). The Oracle Reporting Persons reported that each of Mr. Feinberg and Oracle Associates beneficially owns and has shared voting and dispositive power with respect to 8,695,515 shares of our common stock; Oracle Partners beneficially owns and has shared voting and dispositive power with respect to 4,543,980 shares of our common stock; each of Investment Manager and Ten Fund beneficially owns and has shared voting and dispositive power with respect to 2,595,980 shares of our common stock; and Institutional Partners beneficially owns and has shared voting and dispositive power with respect to 1,555,555 shares of our common stock. Pursuant to the Stockholders Agreement, Oracle Partners and Ten Fund are together entitled to designate one individual to be nominated by the Company to serve on the Company's Board of Directors. Oracle Associates is the general partner of each of Oracle Partners, Ten Fund and Institutional Partners. Investment Manager is the investment manager to Ten Fund. Mr. Feinberg is the managing member of Oracle Associates and the sole stockholder, director and president of Investment Manager. The warrants held by Institutional Partners may not be exercised to the extent such exercise would cause the holder of such warrant (together with the holder's affiliates and any other persons acting as a group together with the holder or any of the holder's affiliates) to beneficially own more than 19.99% of our common stock then outstanding.

(7)Based on the information provided in Amendment No. 4 to Schedule 13D filed with the SEC on April 28, 2015 by Jack W. Schuler and H. George Schuler (together, the "Schuler Reporting Persons"). The Schuler Reporting Persons reported that Mr. George Schuler has shared voting and dispositive power with respect to, and may be deemed to beneficially own, in the aggregate, 7,849,458 shares of our common stock, consisting of 2,359,238 shares of our common stock and warrants held by the Tino Hans Schuler Trust (the "Tino Trust"), 2,359,238 shares of our common stock and warrants held by the Tanya Eve Schuler Trust (the "Tanya Trust"), 2,359,238 shares of our common stock and warrants held by the Therese Heidi Schuler Trust (the "Therese Trust"), 302,220 shares of our common stock and warrants held by the Schuler GC 2010 Continuation Trust (the "Continuation Trust"), 302,220 shares of our common stock and warrants held by the Schuler Grandchildren LLC (the "Grandchildren LLC"), 26,000 shares of our common stock held by Gayle Schuler and 141,304 shares of our common stock held by Seascape Partners L.P. According to

such Schedule 13D amendment, Mr. George Schuler is the sole trustee of each of the Tino Trust, the Tanya Trust, the Therese Trust and the Continuation Trust, and Mr. George Schuler is the manager of each of the Grandchildren LLC and Seascape Partners L.P. In addition, Mr. George Schuler shares with his spouse, Gayle Schuler, the power

to vote or to direct the vote, and the power to dispose or to direct the disposition of, the shares held by Gayle Schuler.

(8) Based on the information provided in Amendment No. 4 to Schedule 13D filed with the SEC on April 28, 2015 by the Schuler Reporting Persons. The Schuler Reporting Persons reported that Mr. Jack Schuler has sole voting and dispositive power with respect to, and may be deemed to beneficially own, in the aggregate, 6,673,029 shares of our common stock, and shared voting and dispositive power with respect to, and may be deemed to beneficially own, in the aggregate, 2,061,342 shares of our common stock, consisting of 6,673,029 shares of our common stock held directly by Mr. Jack Schuler and 2,061,342 shares of our common stock and warrants held by the Jack W. Schuler Living Trust, of which Mr. Jack Schuler serves as sole trustee. Pursuant to the Stockholders Agreement, Mr. Jack Schuler is entitled to designate one individual to be nominated by the Company to serve on the Company's Board of Directors. The warrants held by the Living Trust may not be exercised to the extent such exercise would cause the holder of such warrant (together with the holder's affiliates and any other persons acting as a group together with the holder or any of the holder's affiliates) to beneficially own more than 19.99% of our common stock then outstanding.

(9)Adam Usdan is the trustee of the Feinberg Family Trust.

(10)Based on the information provided in Amendment No. 2 to Schedule 13D filed with the SEC on January 22, 2015 by Matthew Strobeck and Birchview Capital, LP, a Delaware limited partnership ("Birchview LP"). Mr. Strobeck reported that he and Birchview LP have shared power to vote or to direct the vote and to dispose or to direct the disposition of 2,023,070 shares of our common stock and that Mr. Strobeck has shared power to vote or to direct the vote and dispose or to direct the disposition of 31,000 additional shares of our common stock held in custodial accounts in the name of Mr. Strobeck's wife for the benefit of Mr. Strobeck's children. Birchview LP serves as the investment manager of Birchview Fund LLC. Birchview Capital GP, LLC, a Delaware limited liability company (the "General Partner"), is the general partner of Birchview LP. Matthew Strobeck is the sole member of the General Partner.

(11)Paul N. Clark is the trustee of the Paul and Carolyn Clark Revocable Trust of 2009.

LEGAL MATTERS

Sidley Austin LLP will pass upon the validity of the securities being registered by the registration statement of which this prospectus is a part. Michael A. Gordon, a selling stockholder, is a partner in such firm. As of May 1, 2015, Mr. Gordon beneficially owned 175,663 shares of our common stock, including 19,801 warrants he purchased in the December 23, 2014 private placement. Additional legal matters may be passed upon for us or any underwriters, dealers or agents, by counsel that we will name in the applicable prospectus supplement.

EXPERTS

The consolidated financial statements as of December 31, 2014 and 2013 and for the years then ended incorporated by reference in this prospectus have been so incorporated in reliance on the report of BDO USA, LLP, an independent registered public accounting firm, incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities the selling stockholders are offering under this prospectus. This prospectus does not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities the selling stockholders are offering under this prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. You may read and copy, at prescribed rates, any document we file with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for more information about the operation of the Public Reference Room. The SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, including Vermillion, Inc. The SEC's Internet site can be found at http://www.sec.gov. Our filings are also available to the public over the Internet at our website, www.vermillion.com.

Information on any Vermillion website, any subsection, page, or other subdivision of any Vermillion website, or any website linked to by content on any Vermillion website, is not part of this prospectus and you should not rely on that information unless that information is also in this prospectus or incorporated by reference in this prospectus.

IMPORTANT INFORMATION INCORPORATED BY REFERENCE

The SEC allows us to incorporate by reference into this prospectus the information contained in other documents we file with the SEC, which means that we can disclose important information to you by referring you to those documents. Any statement contained in any document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded, for purposes of this prospectus, to the extent that a statement contained in or omitted from this prospectus, or in any other subsequently filed document that also is or is deemed to be incorporated by reference herein, modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus. We incorporate by reference the documents listed below which have been filed by us and any future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items unless such Form 8-K expressly provides to the contrary) until the offering is completed:

(a) Our Annual Report on Form 10-K for the fiscal year ended December 31, 2014 filed with the SEC on March 31, 2015;
(b) Our Current Reports on Form 8-K filed with the SEC on (i) January 13, 2015 (Item 5.02 only), (ii) March 17, 2015, (iii) March 20, 2015 and (iv) April 6, 2015 (Item 5.02 only); and
(c) The description of our common stock set forth in the Registration Statement on Form 8-A filed with the SEC on July 6, 2010 (File No. 001-34810), including any amendments or reports filed for the purpose of updating such description.

Upon written or oral request, we will provide without charge to each person, including any beneficial owner, to whom a copy of the prospectus is delivered a copy of the documents incorporated by reference herein (other than

exhibits to such documents unless such exhibits are specifically incorporated by reference herein). You may request a copy of these filings, at no cost, by writing or telephoning us at the following address:

Vermillion, Inc.

12117 Bee Caves Road, Building Three, Suite 100

Austin, Texas 78738

(512) 519-0400
Attn: Corporate Secretary