

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

POST-EFFECTIVE AMENDMENT NO. 2 TO
FORM S-1
REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

ATOSSA GENETICS INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other
jurisdiction of
incorporation or
organization)

3841
(Primary Standard
Industrial Classification
Code Number)

26-4753208
(I.R.S. Employer
Identification No.)

2345 Eastlake Ave. East, Suite 201
Seattle, Washington 98102
Telephone: (800) 351-3902

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

Steven C. Quay
Chairman, Chief Executive Officer and President
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(Name, address, including zip code, and telephone
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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 Smaller reporting company
(Do not check if a smaller reporting company)

The registrant is an emerging growth company, as defined in Section 2(a) of the Securities Act. This Registration Statement complies with the requirements that apply to an issuer that is an emerging growth company.

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.

EXPLANATORY NOTE:

On November 12, 2013, Atossa Genetics Inc. (the “**Company**”) filed a registration statement with the Securities and Exchange Commission (the “**Commission**”) on Form S-1 (Registration No. 333-192285), which was amended on December 11, 2013 (as so amended, the “**Registration Statement**” or the “**Form S-1**”). The Registration Statement was declared effective by the Commission on December 13, 2013 to register for resale by the selling stockholder identified in the prospectus an aggregate of 4,200,000 shares of our Common Stock, \$0.001 par value per share (the “**Common Stock**”). On April 18, 2014 the Company filed a Post-Effective Amendment No. 1 to the Form S-1, which was declared effective by the Commission on April 25, 2014. This Post-Effective Amendment No. 2 to the Form S-1 (the “**Post-Effective Amendment No. 2**”) is being filed by the registrant pursuant to the undertakings in Item 17 of the Form S-1 to: (i) incorporate by reference the Company’s Annual Report on Form 10-K for the fiscal year ended December 31, 2014; and (ii) update certain other information in the Form S-1.

No additional securities are being registered under this Post-Effective Amendment No. 2. All filing fees payable in connection with the registration of the shares of the Common Stock covered by the Registration Statement were paid by the registrant at the time of the initial filing of the Form S-1.

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 it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

Preliminary Prospectus (Subject to Completion)
dated April 23, 2015



3,528,199 Shares of Common Stock

This prospectus covers the sale of an aggregate of up to 3,528,199 shares of our common stock, \$0.001 par value per share (the "**Common Stock**"), by Aspire Capital Fund, LLC ("**Aspire Capital**" or the "**Selling Stockholder**").

The prices at which the Selling Stockholder may sell the shares of Common Stock will be determined by the prevailing market price for the shares or in negotiated transactions. We will not receive proceeds from the sale of the shares by the Selling Stockholder.

The Selling Stockholder is an "underwriter" within the meaning of the Securities Act of 1933, as amended. We will pay the expenses of registering these shares, but all selling and other expenses incurred by the Selling Stockholder will be paid by the Selling Stockholder.

The Company's Common Stock is traded on the NASDAQ Capital Market under the symbol "ATOS". On April 22, 2015, the closing sale price of our Common Stock on the NASDAQ Capital Market was \$1.65 per share. Our principal executive offices are located at 2345 Eastlake Ave. East, Suite 201, Seattle, Washington 98102 and our telephone number is (800) 351-3902.

Investing in our securities involves risks. You should carefully consider the risk factors beginning on page 7 of this prospectus before you make an investment in our securities.

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 , 2015

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You should read this prospectus, any applicable prospectus supplement and the information incorporated by reference in this prospectus before making an investment in the securities of Atossa Genetics Inc. See “Where You Can Find Additional Information” on page 11 for more information. You should rely only on the information contained in or incorporated by reference 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 document incorporated by reference, 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.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference into it contain, in addition to historical information, certain information, assumptions and discussions that may constitute forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the “**Securities Act**”) and Section 21E of the Securities Exchange Act of 1934, as amended (the “**Exchange Act**”). We have made these statements in reliance on the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These statements are subject to certain risks and uncertainties, which could cause actual results to differ materially from those projected or anticipated. Although we believe our assumptions underlying our forward-looking statements are reasonable as of the date of this prospectus, we cannot assure you that the forward-looking statements set out in this prospectus will prove to be accurate. We typically identify these forward-looking statements by the use of forward-looking words such as “expect,” “potential,” “continue,” “may,” “will,” “should,” “could,” “would,” “seek,” “intend,” “plan,” “estimate,” “anticipate” or the negative version of those words or other comparable words. Forward-looking statements contained in this prospectus include, but are not limited to, statements about:

- Whether we maintain our clearances from the U.S. Food and Drug Administration, or FDA, and foreign regulatory bodies, and the CE Certificates of Conformity granted by our notified body, to sell, market and distribute our medical devices;
- whether we can achieve our revenue forecast and other financial projections for 2015;
- our ability to successfully launch and commercialize the FullCYTE Breast Aspirator in the United States and our ForeCYTE Breast Aspirator outside the United States;
- our ability to successfully continue selling and servicing Pharmacogenomics and NAF cytology testing in our laboratory;
- our ability to successfully sell our products and services at currently expected prices or otherwise at prices acceptable to us;
- our ability to successfully develop and commercialize new tests, tools and treatments currently in development and in the time frames currently expected;
- our ability to maintain our business relationships, including with our distributors, suppliers and customers, while we launch and commercialize the FullCYTE Breast Aspirator in the United States and ForeCYTE Breast Aspirator and laboratory tests outside the United States;
- our ability to engage third party suppliers to manufacture the ForeCYTE Breast Aspirator, FullCYTE Breast Aspirator, FullCYTE Microcatheter, other devices under development and their components at quantities and costs acceptable to us;
- our ability to satisfy ongoing FDA, European Union (EU) and foreign requirements for manufacturing, distributing, and promoting the FullCYTE Breast Aspirator, NAF cytology test and FullCYTE Microcatheter and to obtain regulatory approvals, clearances and CE Certificate of Conformity for our other products and services in development;
- our ability to successfully defend ongoing litigation, including the securities class action law suit filed against us on October 10, 2013, and other similar complaints that may be brought in the future, in a timely manner and within the coverage, scope and limits of our insurance policies;
- the benefits and clinical accuracy of our laboratory tests, including the NAF cytology and Pharmacogenomics tests;
- our ability to establish and maintain intellectual property rights covering our products and services;

- the willingness of health insurance companies, including those who are members of the MultiPlan, FedMed and HealthSmart networks, and other third party payors to approve our products and services for coverage and reimbursement;
- our ability to establish and maintain an independent sales representative force, including with our current and future distributors and their sub-distributors, to market our current products and services and those that we may develop;
- our expectations regarding, and our ability to satisfy, federal, state and foreign regulatory requirements;
- the accuracy of our estimates of the size and characteristics of the markets that our products and services may address;
- our expectations as to future financial performance, expense levels and liquidity sources;
- our ability to attract and retain key personnel; and
- our ability to sell additional shares of our common stock to Aspire Capital under the terms of our purchase agreement with them.

This prospectus also contains estimates and other statistical data provided by independent parties and by us relating to market size and growth and other industry data. These and other forward-looking statements made in this prospectus are presented as of the date on which the statements are made. We have included important factors in the cautionary statements included in this prospectus, particularly in the section titled “Risk Factors,” that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any new information, future events or circumstances that may affect our business after the date of this prospectus. Except as required by law, we do not intend to update any forward-looking statements after the date on which the statement is made, whether as a result of new information, future events or circumstances or otherwise.

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. Unless otherwise noted, (1) the term "Atossa Genetics" refers to Atossa Genetics Inc., a Delaware corporation, (2) the terms "Atossa," the "Company," "we," "us," and "our," refer to the ongoing business operations of Atossa and its wholly-owned subsidiary, The National Reference Laboratory for Breast Health, Inc. (the NRLBH), whether conducted through Atossa Genetics or the NRLBH, although such references as they relate to our laboratory tests and services generally refer to the NRLBH, and (3) the term "Common Stock" refers to shares of Atossa Genetics Inc.'s Common Stock and the term "stockholder(s)" refers to the holders of Common Stock or securities exercisable for Common Stock.

Overview

We are a healthcare company focused on improving breast health through the development of a suite of laboratory services, medical devices and therapeutics. Our laboratory services are being developed and performed by our wholly owned subsidiary, The National Reference Laboratory for Breast Health, Inc. (the "NRLBH"). The NRLBH has developed and is currently marketing nipple aspirate fluid, or NAF, cytology tests and pharmacogenomics tests.

Our medical devices include the ForeCYTE Breast Aspirator for distribution outside the United States and the FullCYTE Breast Aspirator for the U.S. market. These devices are intended for the collection of NAF for cytological testing at a laboratory. The current version of the ForeCYTE Breast Aspirator is not cleared by the FDA for marketing in the United States; however, this device is CE-marked and is therefore being commercialized in the European Union and the countries of the European Free Trade Association (EFTA). The FullCYTE Breast Aspirator does not have a CE-mark, but it has been cleared by the FDA for the collection of NAF for cytological purposes. For this reason the FullCYTE device is being commercialized for the U.S. market. Other devices under development include intraductal microcatheters for the collection of ductal lavage fluid and for the potential administration of a targeted therapeutic, and various tools for potential use by breast surgeons. In March 2015, we launched the FullCYTE Breast Aspirator in the United States and the ForeCYTE Breast Aspirator in the EU and the countries of the EFTA, initially focusing on the Netherlands, Germany, Switzerland, and the United Kingdom.

The ForeCYTE Breast Aspirator will not be launched in the United States unless and until we receive additional regulatory clearance from the FDA.

We plan to develop certain of our medical devices and laboratory tests so that they can be used as companions to pharmaceutical therapies that we plan to develop. For example, we plan to develop our patented intraductal microcatheters for the potential delivery of a pharmaceutical targeted to a condition called ductal carcinoma in-situ, or DCIS, which is the most common type of non-invasive breast cancer. We also plan to develop our medical devices and laboratory tests as companion diagnostics to pharmaceutical therapies to treat women at high risk of breast cancer and for the treatment of ductal hyperplasia or proliferative epithelial disease (PED). These programs are in the early pre-clinical stage and will require testing and approval and/or clearance from the FDA prior to commercialization in the United States.

Our 2015 objectives consist of the following:

(1) Launch and commercialize the FullCYTE Breast Aspirator in the United States: We began the launch of our FullCYTE Breast Aspirator in the United States in March 2015. We have engaged Thermo Fisher Scientific and Henry Schein Medical as our initial U.S. distributors and we plan to build our own specialty sales force.

(2) Launch and commercialize the ForeCYTE Breast Aspirator in the EU: We received CE Certificate of Conformity from our notified body for the ForeCYTE Breast Aspirator and Collection Kits in October 2014 and in March 2015 began the launch of this device in the EU and the countries of the European Free Trade Association (EFTA), focusing initially on the Netherlands, Germany, Switzerland, and the United Kingdom.

(3) Maximize total gross revenue from our products and services: We plan to grow our revenue by selling our products and promoting the tests currently being offered by the NRLBH, including NAF cytology tests and pharmacogenomics tests, and by developing and commercializing additional laboratory tests. We launched the pharmacogenomics test in October 2014 and processed and reported 527 tests through December 31, 2014.

(4) Begin one or more clinical studies using our devices and potential pharmaceutical therapy: We plan to develop a pharmaceutical to be delivered through our patented microcatheters, initially to treat DCIS. We also plan to develop a pharmaceutical to treat one or more conditions detected by the laboratory tests conducted on the NAF specimens collected with our breast aspirator devices. In this fashion, our devices and laboratory tests can be used as companion diagnostics to the therapies we plan to develop. We expect that these therapies and companion diagnostics will initially target DCIS, ductal hyperplasia, PED and/or high risk women and will require lengthy and costly clinical trials that we will undertake only with input and direction from the FDA.

Many of our medical devices and the NRLBH's laboratory services, as well as the breast health companion diagnostics, are currently under development and, if required by the FDA, we must receive additional regulatory clearances and/or approvals prior to marketing and commercialization. The current regulatory status of our devices and the laboratory tests offered by the NRLBH is indicated in the table below.

The NRLBH has been certified pursuant to the Clinical Laboratory Improvement Amendments, or CLIA. CLIA certification is legally required to receive reimbursement from federal or state medical benefit programs, like Medicare and Medicaid, and is a practical requirement for most third-party insurance benefit programs. Our CLIA-certified laboratory, which is permitted to accept samples from all 50 states under its CLIA certification, its state licenses, or, in New York under recognized exemption provisions while its license application is pending, examines the NAF specimens by cytological analysis.

Summary of Our Products and Services

Our products and services currently being offered and currently under development consist primarily of the following:

	Product or Service	Regulatory Status	Primary Market	Commercialization Status
Laboratory Tests Offered or Being Developed by NRLBH	Pharmacogenomics Test	Laboratory Developed Test (LDT); not FDA approved or cleared	United States	Launched October 2014
	NAF Cytology Test	LDT	United States	Launched December 2012
	NextCYTE Breast Cancer Test	LDT	United States	Validation Stage
	ArgusCYTE Breast Health Test	LDT	United States	Validation Stage
	Other Tests	Under Development	Various	N/A
Medical Devices	FullCYTE Breast Aspirator	FDA Cleared	United States	Launched March 2015
	ForeCYTE Breast Aspirator	CE Marked	EU and countries of EFTA	Launched March 2015
	FullCYTE Microcatheter to Collect Ductal Lavage Fluid for Cytology and/or Deliver Therapeutics	Additional FDA Clearance to be Sought	United States	Validation Stage
	Various Diagnostic Tools Including Microendoscopes	FDA Cleared; Additional Clearances may be Required	United States	Pre-launch; Evaluating Commercial Opportunities
Pharmaceuticals	Therapeutic to treat ductal hyperplasia, PED or high risk women	Pre-Clinical; Not approved by the FDA or any other foreign competent authorities	United States; Europe	Pre-clinical
	Therapeutic delivered via our microcatheter to treat DCIS	Pre-Clinical; Not approved by the FDA or any other foreign competent authorities	United States; Europe	Pre-clinical

We have not yet established an ongoing source of revenue sufficient to cover our operating costs and allow us to continue as a going concern. Our ability to continue as a going concern is dependent on obtaining adequate capital to fund operating losses until we become profitable. We plan to obtain additional capital resources by: selling our equity securities; selling the FullCYTE Breast Aspirator in the United States and the ForeCYTE Breast Aspirator outside the United States; generating laboratory service revenue from our services performed by the NRLBH; and borrowing from stockholders or others when needed. However, we cannot assure you that we will be successful in accomplishing any of these plans and, if we are unable to obtain adequate capital, we could be forced to cease operations. In 2013, substantially all of our revenue was from sales of the MASCT System and patient collection kits and from NAF cytology testing services performed by the NRLBH and substantially all of our revenue in 2014 was from pharmacogenomics testing performed by the NRLBH. As a result of the recall of the MASCT System and patient collection kits in October 2013, we did not generate revenue from October 2013 through the third quarter of 2014 when we launched and began generating revenue from the pharmacogenomics test offered by the NRLBH.

We will incur additional sales and marketing expenses as we commercialize the FullCYTE Breast Aspirator in the United States and the ForeCYTE Breast Aspirator in the EU and EFTA and as we continue to promote our pharmacogenomics test. We will need to revise our sales and marketing materials, continue hiring direct sales employees and engage new distributors. We also expect to continue to hire clinical consultants to assist in the sales of our NAF cytology tests. The FullCYTE Breast Aspirator may not gain adoption as quickly as the ForeCYTE Breast Aspirator and it may sell at lower margins. If so, our potential sales and revenues will be negatively impacted.

Implications of being an Emerging Growth Company

As a company with less than \$1 billion in revenue during our last fiscal year, we qualify as an “emerging growth company” as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. As an emerging growth company, we may take advantage of specified reduced disclosure and other requirements that are otherwise applicable generally to public companies. These provisions include:

- only two years of audited financial statements in addition to any required unaudited interim financial statements with correspondingly reduced “Management’s Discussion and Analysis of Financial Condition and Results of Operations” disclosure;
- reduced disclosure about our executive compensation arrangements;
- not having to obtain non-binding advisory votes on executive compensation or golden parachute arrangements; and
- exemption from the auditor attestation requirement in the assessment of our internal control over financial reporting.

We may take advantage of these exemptions for up to five years from our initial public offering or such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company if we have more than \$1 billion in annual revenue, we have more than \$700 million in market value of our stock held by non-affiliates, or we issue more than \$1 billion of non-convertible debt over a three-year period. We may choose to take advantage of some but not all of these reduced burdens. We have taken advantage of these reduced reporting burdens in this prospectus, and the information that we provide may be different than what you might get from other public companies in which you hold stock.

Corporate Information

We were incorporated in Delaware in April 2009. Our principal executive offices are located at 2345 Eastlake Ave. East, Suite 201, Seattle, Washington 98102 and our telephone number is (800) 351-3902. Our corporate website is located at www.atossagenetics.com and our laboratory website is located at www.nrlbh.com. Information contained on, or that can be accessed through, our websites is not a part of this prospectus.

MASCT is our registered trademark and Oxy-MASCT and our name and logo are our trademarks. ForeCYTE, FullCYTE, NextCYTE, ForeCYTE Breast Aspirator and ArgusCYTE are our service marks. This prospectus also includes additional trademarks, trade names and service marks of third parties, which are the property of their respective owners.

THE OFFERING

Common stock covered by this Prospectus:	Up to 3,528,199 shares of Common Stock that may be offered and sold by Aspire Capital.
Common stock outstanding as of March 31, 2015:	27,217,257 shares, including shares previously issued to Aspire Capital.
Use of proceeds:	Aspire Capital will receive all of the proceeds from the sale of the shares offered for sale by it under this prospectus. We will not receive proceeds from the sale of the shares by Aspire Capital.
Risk factors:	The shares offered hereby involve a high degree of risk. See “Risk Factors” beginning on page 7.
Dividend policy:	We currently intend to retain any future earnings to fund the development and growth of our business. Therefore, we do not currently anticipate paying cash dividends on our Common Stock.
Trading Symbol:	Our Common Stock currently trades on the NASDAQ Capital Market under the symbol “ATOS”.

Our Common Stock Purchase Agreements with Aspire Capital Fund, LLC

On March 27, 2013 we entered into a stock purchase agreement with Aspire Capital Fund, LLC, and pursuant to that agreement we have sold Common Stock to Aspire with aggregate gross proceeds to us of approximately \$11.3 million. On November 8, 2013 we terminated that agreement and entered into a new stock purchase agreement with Aspire Capital.

The November 8, 2013 stock purchase agreement with Aspire Capital (the “*Purchase Agreement*”) provides that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital was committed to purchase up to an aggregate of \$25 million of shares of our Common Stock (this amount is in addition to the proceeds we received from sales to Aspire Capital under the March 27, 2013 agreement with them) over the 30-month term of the agreement. Certain terms and conditions of the Purchase Agreement are described below. In connection with our January 2014 public offering we agreed not to utilize the financing arrangement with Aspire for 120 days following completion of that offering.

Concurrent with entering into the Purchase Agreement, we also entered into a registration rights agreement with Aspire Capital. The registration rights agreement provides that the Company will file one or more registration statements, as necessary, to register under the Securities Act the sale of the shares of Common Stock that have been and may be issued to Aspire Capital under the Purchase Agreement. The Company agreed to file an initial registration statement registering the sale of the shares by Aspire Capital with the SEC within 10 days of entering into the Purchase Agreement. We further agreed to keep the registration statement effective and to indemnify Aspire Capital for liabilities in connection with the sale of the shares under the terms of the registration rights agreement.

As of the date of this prospectus, we have issued and sold a total of 3,528,199 shares to Aspire under the Purchase Agreement and may not issue any more shares thereunder.

The issuance of the all shares to Aspire Capital under the Purchase Agreement is exempt from registration under the Securities Act, pursuant to the exemption for transactions by an issuer not involving any public offering under Section 4(a)(2) of the Securities Act and Rule 506 of Regulation D promulgated thereunder.

RISK FACTORS

A purchase of our shares of Common Stock is an investment in our securities and involves a high degree of risk. You should carefully consider the risks and uncertainties and all other information contained in or incorporated by reference in this prospectus, including the risks and uncertainties discussed in our Annual Report on Form 10-K for the fiscal year ended December 31, 2014. All of these risk factors are incorporated by reference herein in their entirety. If any of these risks actually occur, our business, financial condition and results of operations would likely suffer. In that case, the market price of the Common Stock could decline, and you may lose part or all of your investment in our company. Additional risks of which we are not presently aware or that we currently believe are immaterial may also harm our business and results of operations.

USE OF PROCEEDS

The Selling Stockholder will receive all of the proceeds from the sale of the shares offered for sale by it under this prospectus. We will not receive proceeds from the sale of the shares by the Selling Stockholder. We will bear all reasonable expenses incident to the registration of the shares under federal and state securities laws other than expenses incident to the delivery of the shares to be sold by the Selling Stockholder. Any transfer taxes payable on these shares and any commissions and discounts payable to underwriters, agents, brokers or dealers will be paid by the Selling Stockholder.

DIVIDEND POLICY

We have not declared any dividends and do not anticipate that we will declare dividends in the foreseeable future; rather, we intend to retain any future earnings for the development of the business. Payment of future cash dividends, if any, will be at the discretion of our Board of Directors after taking into account various factors, including our financial condition, operating results, current and anticipated cash needs, outstanding indebtedness and plans for expansion and restrictions imposed by lenders, if any.

SELLING STOCKHOLDER

We have included in this prospectus 3,528,199 shares of Common Stock issued to the Selling Stockholder pursuant to the Purchase Agreement, which represents the maximum number of shares that may be sold hereunder by the Selling Stockholder. The following table sets forth certain information regarding the Selling Stockholder and the shares of Common Stock beneficially owned by it as of March 31, 2015. The Selling Stockholder may offer shares under this prospectus from time to time and may elect to sell none, some or all of the shares set forth below. As a result, we cannot estimate the number of shares of Common Stock that the Selling Stockholder will beneficially own after termination of sales under this prospectus. However, for the purposes of the table below, we have assumed that the Selling Stockholder will sell all shares covered by this prospectus.

	Shares Beneficially Owned Before Offering (1)	Percentage of Outstanding Shares Beneficially Owned Before Offering	Shares to be Sold in the Offering	Shares Beneficially Owned After Offering	Percentage of Outstanding Shares Beneficially Owned After Offering
Selling Stockholder					
Aspire Capital Fund, LLC (2)	1,350,000	4.9%	3,528,199	0	0%

- (1) Beneficial ownership is determined in accordance with the rules and regulations of the SEC. In general, a person is deemed to be the beneficial owner of: (i) any shares of our Common Stock over which such person has sole or shared voting power or investment power, plus (ii) any shares which such person has the right to acquire beneficial ownership of within 60 days, whether through the exercise of options, warrants or otherwise. The percentage of ownership set forth above assumes the sale by the Company to Aspire Capital of all shares being offered pursuant to this prospectus and is based on 27,217,257 shares of our Common Stock outstanding as of March 31, 2015, which includes the 3,528,199 shares issued through that date to Aspire Capital.
- (2) Steven G. Martin, Erik J. Brown and Christos Komissopoulos, who are the principals of Aspire Capital, are deemed to be beneficial owners of all of the shares of Common Stock owned by Aspire Capital. Although Messrs. Martin, Brown and Komissopoulos are deemed to have shared voting and investment power over the shares being offered under the prospectus filed with the SEC in connection with the transactions contemplated under the Purchase Agreement, each disclaims beneficial ownership of these shares except to the extent of their pecuniary interest therein. Aspire Capital is not a licensed broker dealer or an affiliate of a licensed broker dealer.

THE ASPIRE CAPITAL TRANSACTION

General

On November 8, 2013, we entered into the Purchase Agreement, which provides that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital was committed to purchase up to an aggregate of \$25 million of shares of our Common Stock over the 30-month term of the Purchase Agreement, subject to certain NASDAQ Capital Market limits described below. In consideration for entering into the Purchase Agreement, concurrently with the execution of the Purchase Agreement we issued to Aspire Capital 375,000 shares of our Common Stock.

Concurrent with entering into the Purchase Agreement, we also entered into a registration rights agreement with Aspire Capital. The registration rights agreement provides that the Company will file one or more registration statements, as necessary, to register under the Securities Act the sale of the shares of Common Stock that have been and may be issued to Aspire Capital under the Purchase Agreement. The Company agreed to file an initial registration statement registering the sale of the shares by Aspire Capital with the SEC within 10 days of entering into the Purchase Agreement. We further agreed to keep the registration statement effective and to indemnify Aspire Capital for liabilities in connection with the sale of the shares under the terms of the registration rights agreement.

As of the date of this prospectus, we have issued and sold a total of 3,528,199 shares to Aspire under the Purchase Agreement and may not issue any more shares thereunder. Pursuant to the Purchase Agreement and the Registration Rights Agreement, we are registering under the Securities Act these 3,528,199 shares of Common Stock issued to Aspire.

Compliance with the NASDAQ Capital Market Rules

The Purchase Agreement provides that the number of shares that may be sold pursuant to the Purchase Agreement is limited to 3,528,199, or the Exchange Cap, which represented 19.99% of our outstanding shares as of November 8, 2013. In order to remain compliant with the applicable listing maintenance rules of the NASDAQ Capital Market, we would need to obtain shareholder approval or rely upon an exception pursuant to the rules of the NASDAQ Capital Market in order to issue more than 19.99%. This limitation would not have applied if, at any time the Exchange Cap was reached and at all times thereafter, the average price paid for all shares issued and sold under the Purchase Agreement were equal to or greater than \$1.98, which was the closing sale price of our Common Stock on November 7, 2013.

No Short-Selling or Hedging by Aspire Capital

Aspire Capital has agreed that neither it nor any of its agents, representatives and affiliates shall engage in any direct or indirect short-selling or hedging, which establishes a net short position with respect to our Common Stock during any time prior to the termination of the Purchase Agreement.

Effect of Performance of the Purchase Agreement on Our Stockholders

The Purchase Agreement does not limit the ability of Aspire Capital to sell any or all of the shares registered in this offering. The sale by Aspire Capital of a significant amount of shares registered in this offering at any given time could cause the market price of our Common Stock to decline or to be highly volatile. Sales to Aspire Capital by us pursuant to the Purchase Agreement also may result in dilution to the interests of other holders of our Common Stock.

PLAN OF DISTRIBUTION

The shares may be sold or distributed from time to time by the Selling Stockholder directly to one or more purchasers or through brokers, dealers, or underwriters who may act solely as agents at market prices prevailing at the time of sale, at prices related to the prevailing market prices, at negotiated prices, or at fixed prices, which may be changed. The sale of the shares offered by this prospectus may be effected in one or more of the following methods:

- ordinary brokers' transactions;
- transactions involving cross or block trades;
- through brokers, dealers, or underwriters who may act solely as agents;
- "at the market" into an existing market for the Common Stock; and
- in other ways not involving market makers or established business markets, including direct sales to purchasers or sales effected through agents in privately negotiated transactions; or any combination of the foregoing.

In order to comply with the securities laws of certain states, if applicable, the shares may be sold only through registered or licensed brokers or dealers. In addition, in certain states, the shares may not be sold unless they have been registered or qualified for sale in the state or an exemption from the registration or qualification requirement is available and complied with.

The Selling Stockholder may also sell shares of Common Stock under Rule 144 promulgated under the Securities Act, if available, rather than under this prospectus. In addition, the Selling Stockholder may transfer the shares of Common Stock by other means not described in this prospectus.

Brokers, dealers, underwriters, or agents participating in the distribution of the shares as agents may receive compensation in the form of commissions, discounts, or concessions from the Selling Stockholder and/or purchasers of the Common Stock for whom the broker-dealers may act as agent. The Selling Stockholder has informed us that each such broker-dealer will receive commissions from Aspire Capital which will not exceed customary brokerage commissions.

The Selling Stockholder and its affiliates have agreed not to engage in any direct or indirect short selling or hedging of our Common Stock during the term of the Purchase Agreement.

The Selling Stockholder is an "underwriter" within the meaning of the Securities Act.

We have advised Selling Stockholder that while it is engaged in a distribution of the shares included in this prospectus it is required to comply with Regulation M promulgated under the Exchange Act. With certain exceptions, Regulation M precludes the Selling Stockholder, any affiliated purchasers, and any broker-dealer or other person who participates in the distribution from bidding for or purchasing, or attempting to induce any person to bid for or purchase any security which is the subject of the distribution until the entire distribution is complete. Regulation M also prohibits any bids or purchases made in order to stabilize the price of a security in connection with the distribution of that security. All of the foregoing may affect the marketability of the shares offered hereby this prospectus.

We may suspend the sale of shares by Aspire Capital pursuant to this prospectus for certain periods of time for certain reasons, including if the prospectus is required to be supplemented or amended to include additional material information.

This offering will terminate on the date that all shares offered by this prospectus have been sold by the Selling Stockholder.

DESCRIPTION OF SECURITIES TO BE REGISTERED

Our authorized capital stock consists of 75,000,000 shares of Common Stock, \$0.001 par value per share, and 10,000,000 shares of preferred stock, \$0.001 par value per share. Below is a description of our Common Stock.

Common Stock

Holders of Common Stock are entitled to receive ratably dividends out of funds legally available, if and when declared from time to time by our Board of Directors. We have never paid any cash dividends on our Common Stock and our Board of Directors does not anticipate that we will pay cash dividends in the foreseeable future. The future payment of dividends, if any, on our Common Stock is within the discretion of the Board of Directors and will depend upon earnings, capital requirements, financial condition and other relevant factors. Holders of Common Stock are entitled to one vote for each share held on each matter to be voted on by stockholders. There is no cumulative voting in the election of directors. In the event of liquidation, dissolution or winding up of the affairs of us, holders of Common Stock are to share in all assets remaining after the payment of liabilities and any preferential distributions payable to preferred stockholders, if any. The holders of Common Stock have no preemptive or conversion rights and are not subject to further calls or assessments. There are no redemption or sinking fund provisions applicable to the Common Stock. The rights of the holders of the Common Stock are subject to any rights that may be fixed for holders of preferred stock, if any. All of the outstanding shares of Common Stock are fully paid and non-assessable.

Certificate of Incorporation

Under our certificate of incorporation, as amended, our Board of Directors, without further action by our stockholders, currently has the authority to issue up to 10,000,000 shares of preferred stock and to fix the rights (including voting rights), preferences and privileges of these “blank check” preferred shares. Such preferred stock may have rights, including economic rights, senior to our Common Stock. As a result, the issuance of the preferred stock could have a material adverse effect on the price of our Common Stock and could make it more difficult for a third party to acquire a majority of our outstanding Common Stock.

Anti-Takeover Devices

Our certificate of incorporation and bylaws include a number of provisions that may have the effect of delaying, deferring or preventing another party from acquiring control of us and encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our Board of Directors rather than pursue non-negotiated takeover attempts. These provisions include the items described below.

Board Composition and Filling Vacancies. In accordance with our certificate of incorporation, our Board of Directors is divided into three classes serving staggered three-year terms, with one class being elected each year. Our certificate of incorporation also provides that directors may only be removed from office for cause and only by the affirmative vote of holders of 75% or more of the outstanding shares of capital stock then entitled to vote at an election of directors. Furthermore, any vacancy on our Board of Directors, however occurring, including any vacancy resulting from an increase in the size of the board, may only be filled by the affirmative vote of a majority of our directors then in office even if less than a quorum. The classification of directors, together with the limitations on removal of directors and treatment of vacancies, has the effect of making it more difficult for stockholders to change the composition of our Board of Directors.

Undesignated Preferred Stock. Our certificate of incorporation authorizes “blank-check” preferred stock, which means that our Board of Directors has the authority to designate one or more series of preferred stock without stockholder approval. These series of preferred stock may have superior rights, preferences and privileges over our Common Stock, including dividend rights, voting rights and liquidation preferences. The ability of our Board of Directors to issue shares of our preferred stock without stockholder approval could deter takeover offers and make it more difficult or costly for a third party to acquire us without the consent of our Board of Directors.

Section 203 of the Delaware General Corporation Law. In addition, our certificate of incorporation does not opt out of Section 203 of the Delaware General Corporation Law, which protects a corporation against an unapproved takeover by prohibiting a company from engaging in any business combination with any interested stockholder (defined as a stockholder owning more than 15% of the outstanding shares) for a period of three years from the time such stockholder became a 15% holder unless approved by our Board of Directors.

Stockholder Rights Agreement. On May 19, 2014, the Company adopted a stockholder rights agreement which provides that all stockholders of record on May 26, 2014 received a non-taxable distribution of one preferred stock purchase right for each share of the Company's common stock held by such stockholder. Each right is attached to and trades with the associated share of common stock. The rights will become exercisable only if one of the following occurs: (1) a person becomes an "Acquiring Person" by acquiring beneficial ownership of 15% or more of the Company's common stock (or, in the case of a person who beneficially owned 15% or more of the Company's common stock on the date the stockholder rights agreement was executed, by acquiring beneficial ownership of additional shares representing 2.0% of the Company's common stock then outstanding (excluding compensatory arrangements)), or (2) a person commences a tender offer that, if consummated, would result in such person becoming an Acquiring Person. If a person becomes an Acquiring Person, each right will entitle the holder, other than the Acquiring Person and certain related parties, to purchase a number of shares of the Company's common stock with a market value that equals twice the exercise price of the right. The initial exercise price of each right is \$15.00, so each holder (other than the Acquiring Person and certain related parties) exercising a right would be entitled to receive \$30.00 worth of the Company's common stock. If the Company is acquired in a merger or similar business combination transaction at any time after a person has become an Acquiring Person, each holder of a right (other than the Acquiring Person and certain related parties) will be entitled to purchase a similar amount of stock of the acquiring entity.

Transfer Agent and Registrar

We have appointed VStock Transfer, LLC, 18 Lafayette Place, Woodmere, New York 11598 (Telephone: (212) 828-8436; Facsimile (646) 536-3179)) as our transfer agent and registrar.

Listing

Our Common Stock is listed on the NASDAQ Capital Market under the symbol "ATOS".

DISCLOSURE OF COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITIES

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

LEGAL MATTERS

Certain legal matters relating to the validity of the Common Stock offered by this prospectus have been passed upon for us by Ropes & Gray, LLP, San Francisco, California.

EXPERTS

The consolidated financial statements as of December 31, 2014 and for the year then ended incorporated by reference in this Prospectus have been so included in reliance on the report of BDO USA, LLP, an independent registered public accounting firm (the report on the consolidated financial statements contains an explanatory paragraph regarding the Company's ability to continue as a going concern) which is incorporated by reference in the Prospectus, given on the authority of said firm as experts in auditing and accounting. KCCW Accountancy Corp., an independent PCAOB registered public accounting firm, has audited the Company's consolidated balance sheets as of December 31, 2013 and the related consolidated statements of operations, stockholders' equity, and cash flows for the year then ended, which are incorporated by reference in this prospectus. The consolidated financial statements are included in reliance on the report of KCCW Accountancy Corp., given their authority as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We are required to file annual, quarterly and special reports, proxy statements and other information with the SEC. You may read and copy any document filed by us 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 further information on the public reference room. Our filings with the SEC are also available to the public at the SEC's Internet web site at <http://www.sec.gov>.

We have filed a registration statement, of which this prospectus is a part, covering the securities offered hereby. As allowed by SEC rules, this prospectus does not include all of the information contained in the registration statement and the included exhibits, financial statements and schedules. You are referred to the registration statement, the included exhibits, financial statements and schedules for further information. This prospectus is qualified in its entirety by such other information.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" information from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus. Information in this prospectus supersedes information incorporated by reference that we filed with the SEC prior to the date of this prospectus.

We incorporate by reference into this prospectus and the registration statement of which this prospectus is a part the information or documents listed below that we have filed with the SEC (Commission File No. 001-35610):

- our Annual Report on Form 10-K for the year ended December 31, 2014, filed with the SEC on March 30, 2015; and
- our current reports on Form 8-K filed with the SEC on January 15, 2015 and April 7, 2015, as amended.

We will furnish without charge to you, on written or oral request, a copy of any or all of the documents incorporated by reference, including exhibits to these documents. You should direct any requests for documents to Kyle Guse, Chief Financial Officer, Atossa Genetics Inc., 2345 Eastlake Ave. E., Suite 201, Seattle, Washington, 98102, telephone: (800) 351-3902. Copies of the above reports may also be accessed from our web site at <http://www.atossagenetics.com>.

Any statement contained in a document incorporated or deemed to be incorporated by reference in this prospectus will be deemed modified, superseded or replaced for purposes of this prospectus to the extent that a statement contained in this prospectus modifies, supersedes or replaces such statement.

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution.

The following table sets forth the costs and expenses, payable by the Company in connection with the registration and sale of the Common Stock being registered. All amounts are estimates except the SEC registration fee.

	Amount to be paid (\$)
SEC registration fee	\$ 1,077
Printing expense	2,000
Legal fees and expenses	10,000
Accounting fees and expenses	5,000
Transfer Agent Fees	1,000
Miscellaneous Fees	5,923
Total	\$ 25,000

Item 14. Indemnification of Directors and Officers.

Section 145 of the Delaware General Corporation Law, or the DGCL, authorizes a corporation to indemnify its directors and officers against liabilities arising out of actions, suits and proceedings to which they are made or threatened to be made a party by reason of the fact that they have served or are currently serving as a director or officer to a corporation. The indemnity may cover expenses (including attorneys' fees) judgments, fines and amounts paid in settlement actually and reasonably incurred by the director or officer in connection with any such action, suit or proceeding. Section 145 permits corporations to pay expenses (including attorneys' fees) incurred by directors and officers in advance of the final disposition of such action, suit or proceeding. In addition, Section 145 provides that a corporation has the power to purchase and maintain insurance on behalf of its directors and officers against any liability asserted against them and incurred by them in their capacity as a director or officer, or arising out of their status as such, whether or not the corporation would have the power to indemnify the director or officer against such liability under Section 145.

We have adopted provisions in our certificate of incorporation and bylaws that limit or eliminate the personal liability of our directors to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended. Consequently, a director will not be personally liable to us or our stockholders for monetary damages or breach of fiduciary duty as a director, except for liability for:

- any breach of the director's duty of loyalty to us or our stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- any unlawful payments related to dividends or unlawful stock purchases, redemptions or other distributions; or
- any transaction from which the director derived an improper personal benefit.
- These limitations of liability do not alter director liability under the federal securities laws and do not affect the availability of equitable remedies such as an injunction or rescission.

In addition, our bylaws provide that:

- we will indemnify our directors, officers and, in the discretion of our Board of Directors, certain employees to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended; and
- we will advance reasonable expenses, including attorneys' fees, to our directors and, in the discretion of our Board of Directors, to our officers and certain employees, in connection with legal proceedings relating to their service for or on behalf of us, subject to limited exceptions.

We have entered into indemnification agreements with each of our directors and certain of our executive officers. These agreements provide that we will indemnify each of these directors and executive officers to the fullest extent permitted by Delaware law. We will advance expenses, including attorneys' fees, judgments, fines and settlement amounts, to each indemnified director, executive officer or affiliate in connection with any proceeding in which indemnification is available and we will indemnify our directors and officers for any action or proceeding arising out of that person's services as an officer or director brought on behalf of the Company or in furtherance of our rights.

We maintain general liability insurance that covers certain liabilities of our directors and officers arising out of claims based on acts or omissions in their capacities as directors or officers, including liabilities under the Securities Act.

Item 15. Recent Sales of Unregistered Securities.

The Company has sold the following securities within the past three years which were not registered under the Securities Act of 1933:

On April 30, 2012, 19,757 non-qualified stock options were granted under the 2010 Stock Option and Incentive Plan to non-employee directors for serving as directors of the Company, at an exercise price of \$6.00 per share. We claimed exemption from registration under the Securities Act for these issuances under Rule 701 promulgated under the Securities Act, in that they were offered and sold either pursuant to written compensatory plans or pursuant to a written contract relating to compensation, as provided by Rule 701.

On September 30, 2012, in connection with its acquisition of substantially all of the assets of Acueity Healthcare, Inc. ("**Acueity**"), the Company issued to the stockholders of Acueity 862,500 shares of Common Stock and warrants to purchase up to 325,000 shares of Common Stock at an exercise price of \$5.00 per share, subject to a six-month lock up agreement. The warrants, which have a five-year term, do not have a cashless exercise provision. The shares and warrants were issued as consideration for the assets acquired from Acueity to manufacture, use and sell a number of diagnostic tools, including: the Viaduct Miniscope and accessories, the Manoa Breast Biopsy system, the Excisor Bioptome, the Acueity Medical Light Source, the Viaduct Microendoscope and accessories. We also acquired cash in the amount of \$400,000. The microendoscopes are less than 0.9 mm outside diameter and can be inserted into a milk duct. This permits a physician to pass a microendoscope into the milk duct system of the breast and view the duct system via fiberoptic video images. Abnormalities that are visualized can then be biopsied from inside the duct with the biopsy tools that are inserted adjacent to the microendoscope. Based on a recent periodic review of the Acueity patent estate, these tools are covered by 15 issued patents (13 U.S. patents, one U.K. patent and one German patent). The issuance of the shares and the warrants was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving a public offering. The Common Stock was valued at \$5.00 per share and the warrants were valued at \$2.3457 per warrant.

On December 20, 2012, the Company issued an option to purchase 200,000 shares of its Common Stock to Christopher Destro as an inducement grant for the employment of Mr. Destro as the Company's Vice President of Sales and Marketing. The option is exercisable at \$4.11 per share which was the fair market value on the date of grant. This transaction was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering.

On January 4, 2013, the Company issued options to purchase 500,000 shares of its Common Stock, exercisable at \$4.11 per share which was the fair market value on the date of grant, to Kyle Guse as an inducement grant for the employment of Mr. Guse as the Company's Chief Financial Officer, General Counsel and Secretary. This transaction was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering.

On January 13, 2013, the Company issued a warrant to purchase 60,000 shares of Common Stock to a consultant as compensation for services to the Company. The warrant has an exercise price of \$4.25 per share which was the fair market value of the Company's Common Stock on the date of grant. The warrant has a net-exercise feature and it vests monthly over one year so long as the consultant continues to provide services to the Company. This transaction was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering.

On January 24, 2013, the Company issued 32,186 shares of Common Stock to consultants as compensation for the performance of services to the Company. The aggregate value of shares issued was \$143,550, or \$4.46 per share, the fair market value of the Company's Common Stock on the date of issuance. This transaction was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering.

On February 25, 2013 the Company issued 1,081,782 shares of Common Stock and on February 28, 2013 the Company issued 139,971 shares of Common Stock, each upon exercise of outstanding warrants. These warrants were exercised on a "net" basis without additional consideration received by the Company. These warrants were originally issued in 2011 in connection with the Company's private placement to accredited investors pursuant to Rule 506 of Regulation D under the Act. This transaction was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering.

On March 27, 2013 we entered into a stock purchase agreement with Aspire Capital Fund, LLC, and pursuant to that agreement we have sold common stock to Aspire with aggregate gross proceeds to us of approximately \$11.3 million. This transaction was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering.

From March through November 2013, as placement agent fees in connection with the March 31, 2013 stock purchase agreement with Aspire Capital, we issued warrants to Dawson James Securities, or its designee, to purchase a total of 67,000 shares of common stock at exercise prices ranging from \$2.12 to \$12.43 per share. These transactions were exempt from registration under Section 4(a)(2) of the Securities Act, as transactions by an issuer not involving any public offering.

On June 3, 2013, the Company issued options to purchase 250,000 shares of its Common Stock, exercisable at \$4.58 per share which was the fair market value on the date of grant, to Peter Carbonaro as an inducement grant for the employment of Mr. Carbonaro as the Company's Sr. Vice President of Operations. This transaction was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering.

On November 8, 2013 the Company entered into a stock purchase agreement with Aspire Capital Fund, LLC, which provides that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital was committed to purchase up to an aggregate of \$25 million of shares of the Company's Common Stock over the 30-month term of the agreement. Under the agreement, on November 8, 2013, Aspire Capital was issued 375,000 shares of Common Stock as a commitment fee. These transactions were exempt from registration under Section 4(a)(2) of the Securities Act, as transactions by an issuer not involving any public offering.

On April 1, 2014, the Company issued options to purchase 300,000 shares of its Common Stock, exercisable at \$1.69 per share which was the fair market value on the date of grant, to Ben Chen as an inducement grant for the employment of Mr. Chen as the Company's Sr. Vice President of Global Regulatory Affairs and Quality Assurance. This transaction was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering.

On June 2, 2014, the Company issued options to purchase 200,000 shares of its Common Stock, exercisable at \$1.41 per share which was the fair market value on the date of grant, to John Sawyer as an inducement grant for the employment of Mr. Sawyer as the Company's Sr. Vice President of Global Regulatory Affairs and Quality Assurance. This transaction was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering.

On September 2, 2014, the Company issued options to purchase 200,000 shares of its Common Stock, exercisable at \$1.86 per share which was the fair market value on the date of grant, to Scott Youmans as an inducement grant for the employment of Mr. Youmans as the Company's Sr. Vice President of Operations. This transaction was exempt from registration under Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering.

On December 23, 2013 the Company issued 500,000 shares of Common Stock to Aspire Capital with gross proceeds to the Company of \$1,000,000. These shares were issued upon achievement of a regulatory milestone as required by the November 8, 2013 agreement with Aspire Capital.

From March 4, 2015 to March 31, 2015 we sold 2,653,199 shares of Common Stock to Aspire Capital under the November 8, 2013 agreement with them, with total gross proceeds to the Company of \$4,292,349.

Item 16. Exhibits and Financial Statement Schedules.

See Exhibit Index set forth on page II-6 to this Registration Statement.

Item 17. Undertakings.

The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser: each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness; *provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers, and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-1 and has duly caused this Post-Effective Amendment No. 2 to the Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Seattle, State of Washington, on April 23, 2015.

Atossa Genetics Inc.

By: /s/ Steven C. Quay
Steven C. Quay, M.D., Ph.D.
Chairman, Chief Executive Officer and President

Pursuant to the requirements of the Securities Act of 1933, this Post-Effective Amendment No. 2 to Registration Statement on Form S-1 has been signed by the following persons in the capacities and on the dates indicated.

Signature	Office(s)	Date
<u>/s/ Steven C. Quay</u> Steven C. Quay, M.D., Ph.D.	Chairman, Chief Executive Officer and President (Principal Executive Officer)	April 23, 2015
<u>/s/ Kyle Guse</u> Kyle Guse	Chief Financial Officer, General Counsel and Secretary (Principal Financial and Accounting Officer)	April 23, 2015
<u>*</u> Shu-Chih Chen, Ph.D.	Director	April 23, 2015
<u>*</u> Stephen J. Galli, M.D.	Director	April 23, 2015
<u>*</u> H. Lawrence Rimmel	Director	April 23, 2015
<u>*</u> Gregory L. Weaver	Director	April 23, 2015
<u>/s/ Richard Steinhart</u> Richard I. Steinhart	Director	April 23, 2015
<u>*By: /s/ Kyle Guse</u> Attorney-in-fact		

EXHIBIT INDEX

Exhibit No.	Description	Incorporated by Reference Herein	
		Form	Date
2.1††	Agreement and Plan of Reorganization, dated September 30, 2012, by and among the Company, Acueity Healthcare, Inc., and Ted Lachowicz, as Stockholder Representative	Registration Statement on Form S-1, as Exhibit 2.1	October 4, 2012
3.1	Certificate of Incorporation of Atossa Genetics Inc.	Registration Statement on Form S-1, as Exhibit 3.2	June 11, 2012
3.2	Bylaws of Atossa Genetics Inc.	Registration Statement on Form S-1, as Exhibit 3.4	June 11, 2012
3.3	Amendment to Bylaws of Atossa Genetics Inc.	Current Report on Form 8-K, as Exhibit 3.1	December 20, 2012
4.1	Specimen Common Stock certificate	Registration Statement on Form S-1, as Exhibit 4.1	May 21, 2012
4.2	Form of Warrant from 2011 private placement	Registration Statement on Form S-1, as Exhibit 4.2	October 4, 2012
4.3	Form of Placement Agent Warrant from 2011 private placement	Registration Statement on Form S-1, as Exhibit 4.3	October 4, 2012
4.4	Form of Warrant dated September 30, 2012	Registration Statement on Form S-1, as Exhibit 4.4	October 4, 2012
4.5	Registration Rights Agreement, dated as of November 8, 2013, by and between the Company and Aspire Capital Fund, LLC	Quarterly Report on Form 10-Q, as Exhibit 4.1	November 12, 2013
4.6	Form of Warrant Agreement from January 2014 Public Offering	Current Report on Form 8-K, as Exhibit 4.1	January 20, 2014
4.7	Form of Warrant issued to Dawson James Securities Inc. in January 2014	Current Report on Form 8-K, as Exhibit 4.2	January 20, 2014
5.1	Opinion of Ropes & Gray LLP	Registration Statement on Form S-1/A, as Exhibit 5.1	December 11, 2013
10.1#	Restated and Amended Employment Agreement with Steven Quay	Registration Statement on Form S-1, as Exhibit 10.3	February 14, 2012
10.2#	Restated and Amended Employment Agreement with Shu-Chih Chen	Registration Statement on Form S-1, as Exhibit 10.4	February 14, 2012
10.3	Form of Indemnification Agreement	Registration Statement on Form S-1, as Exhibit 10.5	May 21, 2012
10.4#	Atossa Genetics Inc. 2010 Stock Option and Incentive Plan, as amended	Registration Statement on Form S-1, as Exhibit 10.6	June 11, 2012
10.5#	Form of Incentive Stock Option Agreement	Registration Statement on Form S-1, as Exhibit 10.7	June 11, 2012

10.6#	Form of Non-Qualified Stock Option Agreement for Employees	Registration Statement on Form S-1, as Exhibit 10.8	June 11, 2012
10.7#	Form of Non-Qualified Stock Option Agreement for Non-Employee Directors	Registration Statement on Form S-1, as Exhibit 10.9	June 11, 2012
10.8	Form of Subscription Agreement	Registration Statement on Form S-1, as Exhibit 10.10	February 14, 2012
10.9	Sublease Agreement with CompleGen, Inc. dated September 29, 2010	Registration Statement on Form S-1, as Exhibit 10.11	February 14, 2012
10.10	Patent Assignment Agreement by and between the Company and Ensisheim Partners, LLC	Registration Statement on Form S-1, as Exhibit 10.12	April 6, 2012
10.11#	Form of Restricted Stock Award Agreement	Registration Statement on Form S-1, as Exhibit 10.13	June 11, 2012
10.12	Business Consultant Agreement with Edward Sauter	Registration Statement on Form S-1, as Exhibit 10.16	February 14, 2012
10.13	Prototype Development Proposal and Terms and Conditions, between the Company and HLB, LLC	Registration Statement on Form S-1, as Exhibit 10.17	February 14, 2012
10.14	Office Lease with Sander Properties, LLC, dated March 4, 2011	Registration Statement on Form S-1, as Exhibit 10.20	April 6, 2012
10.15	Office Lease with Sander Properties, LLC, dated July 8, 2011	Registration Statement on Form S-1, as Exhibit 10.21	April 6, 2012
10.16	Office Lease with Sander Properties, LLC, dated September 20, 2011	Registration Statement on Form S-1, as Exhibit 10.22	April 6, 2012
10.17	Sublease with Fred Hutchinson Cancer Research Center, dated December 9, 2011	Registration Statement on Form S-1, as Exhibit 10.23	April 6, 2012
10.18	Promissory Note — Line of Credit, effective November 3, 2010, by and between the Company and Steven C. Quay	Registration Statement on Form S-1, as Exhibit 10.24	May 21, 2012
10.19†	Term Sheet for License Agreement between the Company and Inven2 AS	Registration Statement on Form S-1, as Exhibit 10.25	June 25, 2012
10.20†	Agreement between the Company and Accellent Inc., dated August 8, 2011	Registration Statement on Form S-1, as Exhibit 10.26	June 25, 2012
10.21†	Supply Agreement between the Company and Biomarker LLC, dated June 24, 2011	Registration Statement on Form S-1, as Exhibit 10.27	June 18, 2012
10.22†	Purchase Agreement between the Company and Hologic Inc., dated May 11, 2011	Registration Statement on Form S-1, as Exhibit 10.28	June 25, 2012
10.23	Agreement between the Company and Biomarker LLC, dated June 22, 2012	Registration Statement on Form S-1, as Exhibit 10.29	June 25, 2012
10.24	Form of Investor Lock-Up Agreement	Registration Statement on Form S-1, as Exhibit 10.30	August 30, 2012
10.25†	Supply and Distribution Agreement, dated as of September 21, 2012, between the Company and Diagnostics Test Group LLC	Registration Statement on Form S-1, as Exhibit 10.31	October 4, 2012

10.26	Employment Agreement between the Company and Kyle Guse dated January 4, 2013#	Registration Statement on Form S-1, as Exhibit 10.31	January 28, 2013
10.27	Purchase Agreement, dated as of March 27, 2013, by and between the Company and Aspire Capital Fund, LLC	Annual Report on Form 10-K, as Exhibit 10.30	March 28, 2013
10.28	Purchase Agreement, dated as of November 8, 2013, by and between the Company and Aspire Capital Fund, LLC	Quarterly Report on Form 10-Q, as Exhibit 10.2	November 12, 2013
10.29	OwnerChip Program Agreement dated September 1, 2013, by and between The National Reference Laboratory for Breast Health, Inc. and Affymetrix, Inc.	Quarterly Report on Form 10-Q, as Exhibit 10.1	November 12, 2013
10.30	License and Services Agreement dated June 10, 2013, between Atossa Genetics and A5 Genetics KFT	Annual Report on Form 10-K, as Exhibit 10.32	March 27, 2014
10.31	Office space Lease dated July 18, 2013 between Alexandria (ARE) and the Company	Annual Report on Form 10-K, as Exhibit 10.33	March 27, 2014
10.32	Common Stock Purchase Agreement, dated as of November 8, 2013, by and between the Company and Aspire Capital Fund, LLC	Quarterly Report on Form 10-Q, as Exhibit 10.2	November 12, 2013
10.33	Lab and Office space Lease Agreement dated March 24, 2014 between Alexandria (ARE) and the Company	Annual Report on Form 10-K, as Exhibit 10.35	March 27, 2014
10.34	Offer Letter Agreement dated March 20, 2014 between the Company and Ben Chen#	Post-Effective Amendment No. 1 to Registration Statement on Form S-1, as Exhibit 10.34	April 28, 2014
10.35#	Offer Letter Agreement with Peter Carbonaro dated May 23, 2013.	Quarterly Report on Form 10-Q, as Exhibit 10.1	May 14, 2014
10.36#	Offer Letter Agreement with Chris Destro dated November 12, 2012.	Quarterly Report on Form 10-Q, as Exhibit 10.2	May 14, 2014
10.37	Office Space Assignment and Assumption of Lease and Consent to Assignment dated August 8, 2014 between Legacy Group, Inc. and the Company.	Quarterly Report on Form 10-Q, as Exhibit 10.1	August 12, 2014
10.38	TME Master Service Agreement dated September 1, 2014 between Targeted Medical Education (TME) and NRLBH	Quarterly Report on Form 10-Q, as Exhibit 10.2	November 12, 2014
10.39#	Offer Letter Agreement with John Sawyer dated May 23, 2014.	Annual Report on Form 10-K, as Exhibit 10.30	March 30, 2015
21.1	List of Subsidiaries	Registration Statement on Form S-1, as Exhibit 21.1	October 4, 2012
23.1	Consent of KCCW Accountancy Corp.	Filed herewith	
23.2	Consent of BDO USA, LLP	Filed herewith	
23.3	Consent of Ropes & Gray LLP (included in Exhibit 5.1)	Registration Statement on Form S-1/A, as Exhibit 5.1	December 11, 2013
24.1	Powers of Attorney	Registration Statement on Form S-1/A,	December 11, 2013

Indicates management contract or compensatory plan, contract or agreement.

† Confidential treatment has been granted for portions of this exhibit. These portions have been omitted from the Registration Statement and submitted separately to the Securities and Exchange Commission.

†† Schedules and exhibits omitted pursuant to Item 601 of Regulation S-K.



Audit • Tax • Consulting • Financial Advisory
Registered with Public Company Accounting Oversight Board (PCAOB)

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the use in this Post-Effective Amendment No. 2 to Form S-1 Registration Statement of Atossa Genetics Inc. of our report dated March 26, 2014 relating to the consolidated financial statements as of and for the year ended December 31, 2013 appearing in the Prospectus, which is part of this Registration Statement. We also consent to the reference to us under the heading “Experts” in such Prospectus.

/s/ KCCW Accountancy Corp.
KCCW Accountancy Corp.

Diamond Bar, California
April 23, 2015

Consent of Independent Registered Public Accounting Firm

Atossa Genetics, Inc.
Seattle, Washington

We hereby consent to the use in the Prospectus constituting a part of this Registration Statement No. 333-192285, Post-Effective Amendment No.2 of our report dated March 30, 2015, relating to the consolidated financial statements of Atossa Genetics, Inc., which is incorporated by reference in that Prospectus. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

We also consent to the reference to us under the caption "Experts" in the Prospectus.

/s/ BDO USA, LLP
BDO USA, LLP
Seattle, Washington

April 23, 2015
