

ATOSSA GENETICS INC
Form S-1/A
May 03, 2018

As filed with the Securities and Exchange Commission on May 3, 2018

Registration Statement No. 333-223949

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

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 26-4753208
(State or other (I.R.S. Employer
Jurisdiction of Identification No.)
incorporation or
organization)

107 Spring Street

Seattle, Washington 98104

Telephone: (866) 893-4927

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

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Chairman, Chief Executive Officer and President

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Approximate Date of Commencement of Proposed Sale to the Public: From time to time after this Registration Statement becomes effective, as determined by the registrant.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box.

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, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box.

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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,” “smaller reporting company” and “emerging growth company” in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer

Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company) Smaller reporting company
Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided to Section 7(a)(2)(B) of the Securities Act.

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	Proposed Maximum Aggregate Offering Price (1)	Amount of Registration Fee
Units consisting of shares of Series B Convertible Preferred Stock, par value \$0.001 per share, and warrants to purchase shares of common stock, par value \$0.18 per share	\$ 25,000,000	\$ 3,113
Non-transferable rights to purchase units (2)	—	—
Series B Convertible Preferred Stock included as part of the units	Included with units above	—
Warrants to purchase shares of common stock included as part of the units (3)		—

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	Included with units above	
Common stock issuable upon conversion of the Series B Convertible Preferred Stock (4)(5)	—	—
Common stock issuable upon exercise of the warrants (5)	\$	\$
Total	\$ 25,000,000	\$ 3,113

Estimated solely for purposes of calculating the registration fee in accordance with Rule 457(o) of the Securities Act of 1933, as amended (the “Act”). Total reflects \$2,490 in filing fees previously paid in connection with the offering.

The rights are being issued without consideration. Pursuant to Rule 457(g), no separate registration fee is payable with respect to the rights being offered hereby since the rights are being registered in the same registration statement as the securities to be offered upon exercise of such rights.

Pursuant to Rule 457(g) of the Act, no separate registration fee is required for the warrants because the warrants are being registered in the same registration statement as the common stock of the Registrant issuable upon exercise of the warrants.

Pursuant to Rule 457(i) of the Act, no separate registration fee is required for the common stock issuable upon conversion of the Series B Convertible Preferred Stock because no additional consideration will be received in connection with the exercise of the conversion privilege.

In addition to the shares of common stock set forth in this table, pursuant to Rule 416 under the Act, this registration statement also registers such indeterminate number of shares of common stock as may become issuable upon conversion or exercise of these securities as the same may be adjusted as a result of stock splits, stock dividends, recapitalizations or other similar transactions.

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

The information in this prospectus is not complete and may be changed. We 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.

Subject to Completion, dated May 3, 2018

PRELIMINARY PROSPECTUS

Subscription Rights to Purchase Up to 25,000 Units

Consisting of an Aggregate of Up to 25,000 Shares of Series B Convertible Preferred Stock

and Warrants to Purchase Up to 7,100,000 Shares of Common Stock

at a Subscription Price of \$1,000 Per Unit

We are distributing to holders of our common stock and warrants we issued on December 22, 2017, at no charge, non-transferable subscription rights to purchase units. Each unit consists of one share of Series B Convertible Preferred Stock and 284 warrants. Each warrant will be exercisable for one share of our common stock. We refer to the offering that is the subject of this prospectus as the rights offering. In the rights offering, you will receive one subscription right for each share of common stock owned at 5:00 p.m., Eastern Time, on May 9, 2018, the record date of the rights offering. The Series B Convertible Preferred Stock and the warrants comprising the units will be separate upon the closing of the rights offering and will be issued separately, however, they may only be purchased as a unit, and the units will not trade as a separate security. The subscription rights will not be tradable. Holders of warrants as of the record date that we issued on December 22, 2017 will also receive subscription rights pursuant to the terms of those warrants.

Each subscription right will entitle you to purchase one unit, at a subscription price of \$1,000 per unit, which we refer to as the basic subscription right. Each warrant entitles you to purchase one share of common stock at an exercise price of \$4.05 per share from the date of issuance through its expiration four years after the date of issuance. The subscription price was determined by our board of directors after a review of recent historical trading prices of our common stock on the Nasdaq Capital Market. If you fully exercise your basic subscription right, you may also exercise an over-subscription privilege to purchase additional units that remain unsubscribed to at the expiration of the

rights offering, subject to the availability and pro rata allocation of units among holders of common stock and warrants entitled to receive subscription rights pursuant to this rights offering (which we refer to as participating warrants) exercising this over-subscription privilege. If all the rights are exercised, the total purchase price of the units offered in the rights offering will be approximately \$25 million.

The subscription rights will expire if they are not exercised by 5:00 p.m., Eastern Time, on May 24, 2018, unless we extend the rights offering period. In our sole discretion, we may extend the rights offering and the period for exercising your subscription rights. You should carefully consider whether to exercise your subscription rights prior to the expiration of the rights offering. All exercises of subscription rights are irrevocable, even if the rights offering is extended by our board of directors.

We have not entered into any standby purchase agreement or other similar arrangement in connection with the rights offering. The rights offering is being conducted on a best-efforts basis and there is no minimum amount of proceeds necessary to be received in order for us to close the rights offering.

Our board of directors is making no recommendation regarding your exercise of the subscription rights. The subscription rights may not be sold, transferred or assigned and will not be listed for trading on any stock exchange or market or on the NASDAQ Capital Market. Our board of directors may cancel the rights offering at any time prior to the expiration of the rights offering for any reason. In the event the rights offering is cancelled, all subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

We have engaged Maxim Group LLC to act as dealer-manager for this offering.

Broadridge Corporate Issuer Solutions, Inc. will serve as the subscription agent for the rights offering. The subscription agent will hold in escrow the funds we receive from subscribers until we complete, abandon or terminate the rights offering. If you want to participate in this rights offering and as of the record date you are the record holder of your shares of common stock or December 22, 2017 warrants, we recommend that you submit your subscription documents to the subscription agent well before the deadline of the rights offering period. If you want to participate in this rights offering and you hold shares through your broker, dealer, custodian bank or other nominee, you should promptly contact your broker, dealer, custodian, bank or other nominee and submit your subscription documents in accordance with the instructions and within the time period provided by your nominee.

Our board of directors reserves the right to terminate the rights offering for any reason any time before the closing of the rights offering. If we terminate the rights offering, all subscription payments received will be returned within 10 business days, without interest or deduction. We expect the rights offering to expire on or about May 24, 2018, subject to our right to extend the rights offering as described above, and that we would close on subscriptions within five business days.

Our common stock is currently quoted on the NASDAQ Capital Market under the symbol “ATOS”. On May 2, 2018, the last reported sale price per share of our common stock on the NASDAQ Capital Market was \$3.83. We do not currently intend to apply for listing of the Series B Convertible Preferred Stock or the warrants on any securities exchange or recognized trading system.

Our principal executive offices are located at 107 Spring Street, Seattle, Washington 98104.

	Per Unit	Total (2)
Subscription price	\$ 1,000	\$ 25,000,000
Dealer-manager fees and expenses (1)	\$ 70	\$ 1,750,000
Proceeds to us, before expenses	\$ 930	\$ 23,250,000

In connection with the rights offering, we have agreed to pay Maxim Group LLC as the dealer-manager a cash fee (1) equal to 7.0% of the gross proceeds received by us directly from exercises of the subscription rights. We have also agreed to reimburse the dealer-manager for its expenses up to \$85,000. Please see “*Plan of Distribution*.”

(2) Assumes the rights offering is fully subscribed, but excludes proceeds from the exercise of warrants included in the units.

Investing in our securities involves risks. You should carefully consider the Risk Factors beginning on page 18 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.

Dealer-Manager

Maxim Group LLC

The date of this prospectus is , 2018

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Neither we nor the dealer-manager has authorized anyone to provide any information or to make any representations other than those contained in this prospectus or in any free writing prospectus prepared by or on behalf of us or to

which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus is an offer to sell only the units offered hereby, but only under the circumstances and in the jurisdictions where it is lawful to do so. The information contained in this prospectus or in any applicable free writing prospectus is current only as of its date, regardless of its time of delivery or any sale of shares of our common stock. Our business, financial condition, results of operations and prospects may have changed since that date. We are not, and the dealer-manager is not, making an offer of these securities in any jurisdiction where such offer is not permitted.

For investors outside the United States: Neither we nor the dealer-manager has done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of securities and the distribution of this prospectus outside the United States.

Unless the context otherwise requires, references in this prospectus to “Atossa” “the Company,” “we,” “us” and “our” refer to Atossa Genetics Inc. Solely for convenience, our trademarks and tradenames referred to in this registration statement, may appear without the ® or ™ symbols, but such references are not intended to indicate in any way that we will not assert, to the fullest extent under applicable law, our rights to these trademarks and tradenames. All other trademarks, service marks and trade names included or incorporated by reference into this prospectus supplement or the accompanying prospectus are the property of their respective owners.

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 54 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. Unless indicated otherwise, all share numbers are expressed in this prospectus reflect the one-for-12 reverse stock split effected on April 20, 2018.

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 these words or other comparable words. Forward-looking statements contained in this prospectus include, but are not limited to, statements about:

whether we can obtain approval from the U.S. Food and Drug Administration, or FDA, and foreign regulatory bodies, to commence our clinical studies and to sell, market and distribute our therapeutics and devices under development;

our ability to successfully initiate and complete clinical trials of our pharmaceutical candidates under development, including endoxifen (Endoxifen; an active metabolite of Tamoxifen) and our intraductal microcatheters to administer therapeutics, including our study using fulvestrant;

the success, cost and timing of our product and drug development activities and clinical trials, including whether the ongoing clinical study using our intraductal microcatheters to administer fulvestrant will enroll a sufficient number of subjects, if any, or be completed in a timely fashion or at all;

our ability to contract with third-party suppliers, manufacturers and service providers, including clinical research organizations, and their ability to perform adequately;

our ability to successfully develop and commercialize new therapeutics currently in development or that we might identify in the future and in the time frames currently expected;

our ability to successfully defend litigation 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;

our ability to establish and maintain intellectual property rights covering our products;

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 capital sources;

our ability to attract and retain key personnel; and

our ability to raise capital.

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 entitled “*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

Our Company

We are a clinical-stage pharmaceutical company focused on developing novel, proprietary therapeutics and delivery methods for the treatment of breast cancer and other breast conditions. We are developing Endoxifen with two routes of delivery: a topical formulation, applied like a lotion, for the treatment of a condition called mammographic breast density (or, MBD) and a breast disorder in men called gynecomastia; and an oral formulation for breast cancer survivors who do not benefit from taking oral tamoxifen, a current FDA-approved standard of care. We are also developing our patented intraductal microcatheter technology to potentially target the delivery of therapies, including fulvestrant, immunotherapies and Chimeric Antigen Receptor T-cell therapies (CAR-T therapies), directly to the site of breast cancer.

In 2017, we completed a Phase 1 clinical study of our proprietary oral and topical formulations of Endoxifen. All objectives were met: there were no clinically significant safety signals and no clinically significant adverse events, and both the oral and topical Endoxifen were well tolerated. In the topical arm of the study, low but measurable Endoxifen levels were detected in the blood in a dose-dependent fashion. In the oral arm of the study, participants exhibited dose-dependent Endoxifen levels that met or exceeded the published therapeutic level. The median time for patients in the study to reach the steady-state serum levels of Endoxifen while taking daily doses of oral Endoxifen was 7 days. Published literature indicates that it takes approximately 50-200 days for patients to reach steady-state Endoxifen levels when taking daily doses of oral tamoxifen.

We are currently conducting a Phase 2 study at Montefiore Medical Center, Bronx, New York, using our intraductal microcatheter technology to deliver fulvestrant. Our program to use our intraductal microcatheters to deliver CAR-T and other immunotherapies is in the research and development phase.

In March 2018, we expanded our breast health program by launching a mens' breast health initiative with enrollment opening in a Phase 1 study of our topical Endoxifen in men. The objectives of the placebo-controlled, repeat dose study of 24 healthy male volunteers are to assess the pharmacokinetics of proprietary topical Endoxifen dosage forms over 28 days, as well as to assess safety and tolerability. Depending on the results of this study, we plan to develop our topical Endoxifen for gynecomastia.

We plan to open enrollment in two Phase 2 studies of our proprietary Endoxifen in the first half of 2018: a study in Stockholm, Sweden using our topical Endoxifen to treat MBD and a study of our oral Endoxifen to treat patients who do not benefit from taking tamoxifen. We expect to complete enrollment in these studies in the second half of 2018.

Our key objectives are to advance our programs through Phase 2 trials and then evaluate further development independently or with partners.

Our common stock is currently quoted on the NASDAQ Capital Market under the symbol “ATOS.”

Our Programs Under Development

Endoxifen - Background

Oral tamoxifen has been widely used for over 30 years to both treat and prevent breast cancer. Tamoxifen, however, has significant drawbacks. First, it can cause side effects including headaches, nausea and early menopausal symptoms as well as rare but serious side effects such as cataracts, strokes and cancer of the uterus. Second, tamoxifen is a “pro-drug,” meaning that it must be processed by the liver in order to produce therapeutic metabolites. The metabolite in tamoxifen that accounts for most of its therapeutic activity is called Endoxifen. Unfortunately, up to 50% of breast cancer survivors who are taking tamoxifen do not produce therapeutic levels of Endoxifen (meaning they are “refractory”) for a number of reasons including that they, due to their genotype, do not have the requisite liver enzymes. Additionally, it can take from 50-200 days for tamoxifen to reach “steady-state” meaning that the drug may be providing little or no benefit for up to several months after starting treatment. We are developing Endoxifen to address the shortcomings of tamoxifen.

Proprietary Endoxifen - Completed Phase 1 Study

We recently completed a comprehensive Phase 1 study in 49 healthy women in Australia using both the topical and oral forms of our proprietary Endoxifen. The objectives of this double-blinded, placebo-controlled, Phase 1 study were to assess the pharmacokinetics of our proprietary Endoxifen dosage forms as single (oral) and repeat (oral and topical) doses, as well as to assess safety and tolerability. The study was conducted in two parts based on route of administration.

In September 2017, we reported preliminary results for the topical arm of the study and in October 2017 we reported preliminary results for the oral arm of the study. We concluded that all objectives were successfully met in both arms of the study: there were no clinically significant safety signals and no clinically significant adverse events and both the oral and topical Endoxifen were well tolerated. In the topical arm of the study, there were low but measurable Endoxifen levels detected in the blood in a dose-dependent fashion and in the oral arm of the study participants exhibited dose-dependent Endoxifen levels in published reports of the therapeutic range. The median time for patients in the study to reach the steady-state serum levels of Endoxifen while taking daily doses of oral Endoxifen was 7 days. Published literature indicates that it takes approximately 50-200 days for patients to reach steady-state Endoxifen levels when taking daily doses of oral tamoxifen. Finally, the median time for patients in the study to reach the maximum serum level of Endoxifen after taking Atossa's oral Endoxifen ranged from 4 to 8 hours (depending on dose). The 4 mg dose of Endoxifen produced a maximum serum level of Endoxifen in 4 to 8 hours at levels above the generally accepted threshold for a therapeutic effect on estrogen-dependent breast cancer.

Proprietary Topical Endoxifen

We are developing topical, or "transdermal," Endoxifen for several potential indications. One potential indication is women with MBD. Legislation that has been recently enacted in approximately 30 states requires that women be notified if they have MBD and those notifications typically state that women with MBD have a higher risk of developing breast cancer, and that mammography may not be as effective in detecting breast cancer because the MBD can "mask" the detection of cancers. We estimate that approximately ten million women in the United States have MBD, for which there is no FDA-approved treatment. Although oral tamoxifen is approved to prevent breast cancer in "high-risk" women, it is used by less than 5% of women with an increased risk of developing breast cancer because of the actual or perceived side effects and risks of tamoxifen.

We believe our topical Endoxifen may provide an effective treatment for MBD because, unlike an oral medication, it is applied directly to the breast and penetrates the skin, it does not require metabolism by the liver, and it may produce fewer side effects than tamoxifen. Moreover, our topical Endoxifen may improve mammography accuracy and patient care by unmasking cancerous tumors that are otherwise hidden by breast density. In two separate reports of film-screen mammography, mammographic sensitivity decreased from a level of 85.7%–88.8% in patients with almost

entirely fatty tissue to 62.2%–68.1% in patients with extremely dense breast tissue.

We are also developing our proprietary topical Endoxifen for gynecomastia. Gynecomastia is male breast enlargement and accompanying pain. It is the most common male breast disorder and is caused by a hormone imbalance where testosterone is low compared to estrogen. Gynecomastia is caused by, among other things, any number of commonly prescribed medications, such as androgen deprivation therapy to treat prostate enlargement and prostate cancer, anti-anxiety medications, cancer treatments (chemotherapy), and some heart medications. Gynecomastia is not only painful and embarrassing, it can also cause men to stop taking these important medications. In prostate cancer treatment, testosterone is suppressed resulting in higher estrogen levels that usually triggers gynecomastia. Prophylactic breast bud irradiation is commonly used in prostate cancer patients, but must often be repeated. One recent study indicates that up to 90% of men taking androgen deprivation therapy suffer from gynecomastia and breast pain (Handoo Rhee, et al., October 18, 2014, *BJU International*).

There are no FDA-approved therapeutics for gynecomastia. Breast-bud irradiation, use of compression garments and plastic surgery are the most common approaches used to treat gynecomastia.

Similar to women, the treatment for male breast cancer is typically surgery (with or without radiation) and chemotherapy. Breast cancer in men is deadlier than breast cancer in women: men with early-stage breast cancer have a lower five-year survival rate than women and breast cancer in men tends to be detected at a later stage of development than women (Jon M. Greif, DO, FACS, et al., May 2012, *American Society of Breast Surgeons*). Although tamoxifen is the standard of care for women to prevent new and recurrent breast cancer, there is no FDA-approved treatment for male breast cancer.

Proprietary Oral Endoxifen

We are also developing an oral form of Endoxifen for breast cancer patients who are refractory to tamoxifen. Approximately one million breast cancer patients take tamoxifen to prevent recurrent and new breast cancer; however, up to 50% of those patients are refractory to tamoxifen. We believe our oral Endoxifen may provide an effective treatment supplement or option for these refractory patients because Endoxifen, unlike tamoxifen, does not require liver metabolism.

Proprietary Endoxifen – Current and Future Clinical Studies

In September 2017, we contracted Stockholm South General Hospital in Sweden to conduct a Phase 2 study of our topical Endoxifen. The study will be led by principal investigator Dr. Per Hall, MD, Ph.D., Head of the Department of Medical Epidemiology and Biostatistics at Karolinska Institutet. We have applied for approval from the Institutional Review Board and Swedish regulatory authority (Medical Products Agency) to begin enrollment. The primary endpoint is MBD reduction, as well as safety and tolerability. We are planning to open this study in the first half of 2018 and to complete enrollment in the second half of 2018.

We plan to commence a Phase 2 clinical study using our oral Endoxifen for patients who are refractory to tamoxifen. We plan to open the study in the first half of 2018 and to complete it in the second half of 2018.

In March 2018, we opened enrollment in a Phase 1 study of our topical Endoxifen in men. The objectives of the placebo-controlled, repeat dose study of 24 healthy male volunteers are to assess the pharmacokinetics of proprietary topical Endoxifen dosage forms over 28 days, as well as to assess safety and tolerability. The study is being conducted

on behalf of Atossa by CPR Pharma Services Pty Ltd., Thebarton, SA, Australia. CPR Pharma recently completed the successful Phase 1 study of our oral and topical Endoxifen in women.

Proprietary Intraductal Microcatheter Technology

We believe our patented intraductal microcatheters may be useful in delivering CAR-T, immunotherapies and a number of drugs to the ducts in the breast, the site of the majority of early breast cancers. Doing so is intended to provide a therapeutic directly to the breast tissue while at the same time reducing delivery of the drug to healthy tissue. We must obtain FDA approval of any therapy delivered via our intraductal microcatheters devices, which will require expensive and time-consuming studies in the current regulatory framework. For example, we must complete clinical studies to demonstrate the safety and tolerability of fulvestrant using our delivery method. We may not be successful in completing these studies or obtaining approval from the FDA or other applicable foreign regulatory authority.

Breast cancers and precancerous lesions are typically treated with systemically administered agents such as tamoxifen, Faslodex, Perjeta and Herceptin. However, these therapies can cause serious side effects which may lead to poor patient compliance with the treatment regimens. Providing therapies directly into the breast ducts targeting the site of the localized cancerous lesions could reduce the need for systemic anti-cancer therapies, and potentially reduce or eliminate the systemic side effects of the therapies and morbidity in such patients, and ultimately improve patient compliance and ultimately reduce mortality.

TRAP CAR-T

Much of the recent success in the field of chimeric antigen receptor therapy, or CAR-T, has relied on the systemic delivery (for example a needle injection into the blood stream) of the CAR-T which is intended to treat various non-solid tumor cancers, such as blood cancers. One concern with this systemic approach is that it does not target the location of the cancer and it can have adverse affects, including deadly “cytokine storms.” Moreover, CAR-T treatments delivered systemically can be as high as \$500,000 per patient.

We are developing a novel method to deliver CAR-T cells into the ducts of the breast for the potential targeted treatment of breast cancer. This approach uses our proprietary intraductal microcatheter technology for the potential transpapillary, or “TRAP,” delivery of either T-cells that have been genetically modified to attack breast cancer cells or various immune-therapies. We believe this method has several potential advantages including the reduction of toxicity by limiting systemic exposure of the T-cells or immunotherapy; improved efficacy by placing the T-cells or immunotherapy in direct contact with the target ductal epithelial cells that are undergoing malignant transformation; and, lymphatic migration of the CAR-T cells or immunotherapy potentially extending their cytotoxic actions into the regional lymph system, which could limit tumor cell dissemination. Moreover, our proprietary approach may be more cost effective if lower doses of therapy can be delivered compared to systemic CAR-T. Our approach is in the R&D stage and is currently not FDA approved. In 2018 we intend to commence studies that will help demonstrate safety and efficacy of this novel approach.

The TRAP delivery of therapeutics in breast cancer clinical trials have demonstrated “that cytotoxic drugs can be safely administered into breast ducts with minimal toxicity” (Zhang B, et al. Chin J Cancer Res. 2014 Oct;26(5):579-87; www.ncbi.nlm.nih.gov/pubmed/25400424). T cells are removed from a patient and modified so that they express receptors specific to the patient’s particular breast cancer. The T cells, which can then recognize and kill the cancer cells, are reintroduced into the patient using a microcatheter into the natural ducts of the breast. Chimeric antigen receptors (or, “CARs” and also known as chimeric immunoreceptors, chimeric T cell receptors, artificial T cell receptors or CAR-T) are engineered receptors, which graft an arbitrary specificity onto an immune effector cell (“T cell”). Typically, these receptors are used to graft the specificity of a monoclonal antibody onto a T cell, with transfer of their coding sequence facilitated by retroviral vectors. The receptors are called chimeric because they are composed of parts from different sources.

We have developed a foundational intellectual property position with respect to TRAP CAR-T, and we intend to continue research and development through partnership with leading investigators, institutions, and organizations around the world, bringing our technology and expertise in TRAP delivery together with experts in cancer immunology and T-cell biology.

Delivery of Drugs via our Microcatheters

The initial drug we are studying using our microcatheters for intraductal delivery is fulvestrant. Fulvestrant is FDA-approved for metastatic breast cancer. It is administered as a monthly injection of two shots, typically into the buttocks. In 2012 a published study documented that the single dose cost of intramuscular fulvestrant was approximately \$12,000.

We own several pending patent applications directed to the treatment of breast conditions, including cancer, by the intraductal administration of therapeutics including fulvestrant, and one issued patent directed to intraductal treatment of breast conditions following a diagnosis of breast conditions using ductal fluid.

We do not yet have the FDA's input, but based on our preliminary analysis, subject to FDA feedback, we believe that the intraductal fulvestrant program could qualify for designation under the 505(b)(2) status. This would allow us to file with only clinical data and without having to perform additional, significant clinical or pre-clinical studies. So the path to market is potentially both faster and less expensive than a standard new drug application, or NDA, program.

We are currently conducting a Phase 2 study using our microcatheter technology to deliver fulvestrant at Montefiore Medical Center. This trial is a Phase 2 study in women with ductal carcinoma in situ (“DCIS”) or Stage 1 or 2 breast cancer (invasive ductal carcinoma) scheduled for mastectomy or lumpectomy within 30 to 45 days. This study is assessing the safety, tolerability, cellular activity and distribution of fulvestrant when delivered directly into breast milk ducts of these patients compared to those who receive the same drug by injection. Of the 30 patients required for full enrollment, six will receive the standard intramuscular injection of fulvestrant and 24 will receive fulvestrant with our microcatheter device.

The primary endpoint of the clinical trial is to compare the safety, tolerability and distribution of fulvestrant between the two routes of administration (intramuscular injection or through our microcatheters). The secondary endpoint of the study is to determine if there are changes in the expression of Ki67 (a measure of cellular proliferation that correlates with tumor growth) as well as estrogen and progesterone receptors between a pre-fulvestrant biopsy and post-fulvestrant surgical specimens. Digital breast imaging before and after drug administration in both groups will also be performed to determine the effect of fulvestrant on any lesions as well as breast density of the participant.

Other Studies of Intraductal Administration using our Microcatheters

An October 2011 peer-reviewed paper published in Science Translational Medicine reported the results of a study conducted at the Johns Hopkins Medical School demonstrating the prevention of breast cancer in rats with intraductal non-systemic chemotherapy, and a proof-of-principle Phase 1 clinical trial involving 17 women with breast cancer who subsequently received surgery. An accompanying editorial commented that “intraductal treatment could be especially useful for women with premalignant lesions or those at high risk of developing breast cancer, thus drastically improving upon their other, less attractive options of breast-removal surgery or surveillance (termed ‘watch and wait’).”

In a December 2012 peer-reviewed paper published in Cancer Prevention Research, Dr. Susan Love and her colleagues reported the results of a Phase I clinical trial of intraductal chemotherapy drugs administered into multiple ducts within one breast in women awaiting mastectomy for treatment of invasive cancer. Thirty subjects were enrolled in this dose escalation study conducted at a single center in Beijing, China. Under local anesthetic, one of two chemotherapy drugs, carboplatin or pegylated liposomal doxorubicin (PLD), was administered into five to eight ducts at three dose levels. Pharmacokinetic analysis has shown that carboplatin was rapidly absorbed into the bloodstream, whereas PLD, though more erratic, was absorbed after a delay. Pathologic analysis showed marked effects on breast duct epithelium in ducts treated with either drug compared with untreated ducts. The investigators concluded the study showed the safety and feasibility of intraductal administration of chemotherapy drugs into multiple ducts for the purpose of breast cancer prevention and that this was an important step towards implementing of this strategy as a “chemical mastectomy,” potentially eliminating the need for surgery.

Markets

Potential Market Opportunities

We believe that, based in part on a January 2017 study by Defined Health, a leading market research firm, the potential U.S. market for intraductal administration of fulvestrant or similar drugs in DCIS patients is up to \$800 million annually. This estimate includes treatment of DCIS patients prior to surgery as well as patients who would use intraductal treatment as an alternative to surgery. We believe that the potential U.S. market for endoxifen in the treatment and prevention settings is up to \$1 billion annually.

The Breast Cancer and Related Markets

The American Cancer Society (“ACS”) estimated that in 2018, 268,000 women will be diagnosed with breast cancer in the United States. Every two minutes an American woman is diagnosed with breast cancer and 41,000 die each year. Although about 100 times less common than in women, breast cancer also affects men. The ACS estimated that the lifetime risk of men getting breast cancer is about 1 in 1,000; 2,550 new cases of invasive breast cancer will be diagnosed; and 480 men will die from breast cancer in 2018.

Gynecomastia

According to the Mayo Clinic, although it can affect men at almost any age, gynecomastia is most prevalent in men ages 50-69, affecting at least 1 in 4 men in this age group.

We were incorporated in April of 2009 and our common stock is currently quoted on the NASDAQ Capital Market under the symbol “ATOS.”

SUMMARY OF THE RIGHTS OFFERING

Securities to be Offered:	We are distributing to you, at no charge, one non-transferable subscription right to purchase one unit for each share of our common stock (or share of common stock issuable upon exercise of our December 22, 2017 warrants) that you owned as of the record date. Each unit consists of one share of Series B Convertible Preferred Stock and 284 warrants.
Size of Offering:	25,000 units.
Subscription Price:	\$1,000 per unit.
Series B Convertible Preferred Stock:	Each share of Series B Convertible Preferred Stock will be convertible, at our option at any time on or after the first anniversary of the closing of the rights offering or at the option of the holder at any time, into the number of shares of our common stock determined by dividing the \$1,000 stated value per share of the Series B Convertible Preferred Stock by a conversion price of \$3.52 per share, subject to adjustment. The Series B Convertible Preferred Stock has certain conversion rights and dividend rights.
Warrants:	Each warrant entitles the holder to purchase one share of common stock at an exercise price of \$4.05 per share, subject to adjustment, through its expiration four years from the date of issuance. The warrants will be exercisable for cash, or, solely during any period when a registration statement for the exercise of the warrants is not in effect, on a cashless basis. We do not intend to apply to list the warrants on any securities exchange or recognized trading system. We may redeem the warrants for \$0.18 per warrant if the volume-weighted average price ("VWAP") of our common stock equals or exceeds \$10.56 per share for ten consecutive trading days, provided that we may not do so prior to the first anniversary of closing of the rights offering.
Record Date:	5:00 p.m., Eastern Time, on May 9, 2018.
Basic Subscription Rights:	Each subscription right entitles you to purchase one unit at the subscription price. You may not purchase a partial unit.
Over-Subscription Privilege:	If you exercise your basic subscription rights in full, you may also choose to purchase a portion of the units that are not purchased by our other holders of common stock and participating warrants through the exercise of their basic subscription rights, subject to proration and stock ownership limitations described elsewhere in this prospectus.
Expiration Date:	5:00 p.m., Eastern Time, on May 24, 2018.
Procedure for Exercising Subscription	To exercise your subscription rights, you must take the following steps:

Rights:

If as of the record date you are a record holder of our common stock or warrants issued December 22, 2017, you must deliver payment and a properly completed rights certificate to the subscription agent to be received before 5:00 p.m., Eastern Time, on May 24, 2018. You may deliver the documents and payments by first class mail or courier service. If you use first class mail for this purpose, we recommend using registered mail, properly insured, with return receipt requested.

If you are a beneficial owner of shares that are registered in the name of a broker, dealer, bank or other nominee, you should instruct your broker, dealer, bank or other nominee to exercise your subscription rights on your behalf. Please follow the instructions of your nominee, who may require that you meet a deadline earlier than 5:00 p.m., Eastern Time, on May 24, 2018.

Delivery of Shares and Warrants:	As soon as practicable after the expiration of the rights offering, and within five business days thereof, we expect to close on subscriptions and for the subscription agent to arrange for the issuance of the shares of Series B Convertible Preferred Stock and warrants purchased pursuant to the rights offering. All shares and warrants that are purchased in the rights offering will be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration, or DRS, account statement from our transfer agent reflecting ownership of these securities if you are a holder of record of shares or warrants. If you hold your shares or participating warrants in the name of a bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the securities you purchased in the rights offering.
Non-Transferability of Subscription Rights:	Subscription rights may not be sold, transferred, assigned or given away under any circumstances, and will not be listed for trading on any stock exchange or market.
Transferability of Warrants:	The warrants will be separately transferable following their issuance and through their expiration four years from the date of issuance.
No Board Recommendation:	Our board of directors is not making a recommendation regarding your exercise of the subscription rights. You are urged to make your decision to invest based on your own assessment of our business and financial condition, our prospects for the future, the terms of the rights offering, the information in this prospectus and other information relevant to your circumstances. Please see “ <i>Risk Factors</i> ” for a discussion of some of the risks involved in investing in our securities.
No Revocation:	All exercises of subscription rights are irrevocable.
Use of Proceeds:	Assuming the exercise of subscription rights to purchase all 25,000 units offered in the rights offering, after deducting dealer-manager fees and other fees and expenses, but excluding any proceeds received upon exercise of any warrants, we estimate the net proceeds from the rights offering will be approximately \$23 million. We intend to use the net proceeds for general corporate purposes, which include, but are not limited to, funding our ongoing and future development of our drugs and devices under development, and for general and administrative expenses. We may also use a portion of the net proceeds to pay off outstanding indebtedness, if any, and/or acquire or invest in complementary businesses, products and technologies. See “ <i>Use of Proceeds</i> .”
Material U.S. Federal Income Tax Consequences:	For U.S. federal income tax purposes, we do not believe you should recognize income or loss upon receipt or exercise of a subscription right. You should consult your own tax advisor as to the tax consequences of the rights offering in light of your particular circumstances. See “ <i>Material U.S. Federal Income Tax Consequences</i> .”
Extension and Termination:	We may extend the rights offering for additional time in our sole discretion, although we do not presently intend to do so. Our board of directors may also terminate the rights offering for any reason prior to its completion.
Subscription Agent Questions:	If you have any questions about the rights offering, please contact the subscription agent.

Subscription Agent Broadridge Corporate Issuer Solutions, Inc.

Market for Common Stock: Our common stock is listed on the NASDAQ Capital Market under the symbol “ATOS.”

**Market for
Preferred Stock:**

There is no established public trading market for the Series B Convertible Preferred Stock, and we do not expect a market to develop. In addition, we do not currently intend to apply for listing of the Series B Convertible Preferred Stock on any securities exchange or recognized trading system.

**Market for
Warrants**

There is no established trading market for the warrants, and the warrants may not be widely distributed. We do not intend to list the warrants for trading on any securities exchange or recognized trading system.

Dealer-Manager: Maxim Group LLC

QUESTIONS AND ANSWERS ABOUT THE RIGHTS OFFERING

The following are examples of what we anticipate will be common questions about the rights offering. The answers are based on selected information included elsewhere in this prospectus. The following questions and answers do not contain all of the information that may be important to you and may not address all of the questions that you may have about the rights offering. This prospectus and the documents incorporated by reference herein contain more detailed descriptions of the terms and conditions of the rights offering and provide additional information about us and about our business, including potential risks related to the rights offering, the units offered hereby, and our business.

Exercising the subscription rights and investing in our securities involve a high degree of risk. We urge you to carefully read the section entitled “Risk Factors” beginning on page 18 of this prospectus and all other information included in, or incorporated by reference into, this prospectus in its entirety before you decide whether to exercise your subscription rights.

What is the rights offering?

We are distributing to holders of shares of our common stock and holders of our December 22, 2017 warrants as of 5:00 p.m., Eastern Time, on May 9, 2018, which is the record date for the rights offering, at no charge, non-transferable subscription rights to purchase units, each consisting of one share of Series B Convertible Preferred Stock and 284 warrants. Each warrant will be exercisable for one share of our common stock. You will receive one subscription right for each share of common stock (including each share of common stock issuable upon exercise of warrants issued December 22, 2017) you owned as of 5:00 p.m., Eastern Time, on the record date. Each subscription right entitles the holder to a basic subscription right and an over-subscription privilege, which are described below. Upon closing of the rights offering, the Series B Convertible Preferred Stock and warrants will immediately separate. We do not intend to apply to list the warrants on any securities exchange or recognized trading system. The common stock to be issued upon conversion of the Series B Convertible Preferred Stock or exercise of the warrants, like our existing shares of common stock, will be traded on the NASDAQ Capital Market under the symbol “ATOS.”

Why are we conducting the rights offering?

We are conducting the rights offering to provide for our general corporate purposes, which include, but are not limited to, funding our ongoing and future development of our drugs and devices under development and for general and administrative expenses. For a detailed discussion, see “Use of Proceeds.”

Our Board of Directors (the “Board”) has approved the rights offering and, based on information available to the Board and its subsequent analyses, believes that the rights offering is in the best interests of the Company and its stockholders. However, our Board is not making any recommendation regarding your exercise of the subscription rights.

What is the basic subscription right?

Each basic subscription right gives our stockholders and holders of our December 22, 2017 warrants the opportunity to purchase units consisting of one share of Series B Convertible Preferred Stock and 284 warrants at a subscription price of \$1,000 per unit, subject to the limits described below. We have granted to you, as a stockholder or warrant holder of record as of 5:00 p.m., Eastern Time, on the record date, one subscription right for each share of our common stock you owned at that time. For example, if you owned 1,000 shares of our common stock as of 5:00 p.m., Eastern Time, on the record date, you would have received 1,000 subscription rights and would have the right to purchase 1,000 units for \$1,000 per unit subject to certain limitations. You may exercise all or a portion of your basic subscription rights or you may choose not to exercise any subscription rights at all. However, if you exercise fewer than all of your basic subscription rights, you will not be entitled to purchase any additional shares pursuant to the over-subscription privilege.

If you hold ATOS stock certificates or participating warrants, the number of basic subscription rights you may exercise is indicated on the enclosed rights certificate. If you hold your shares or participating warrants in the name of a custodian bank, broker, dealer or other nominee, you will not receive a rights certificate. Instead, the Depository Trust Company (“DTC”) will issue one subscription right to the nominee record holder for each share of our common stock (including shares issuable upon exercise of participating warrants) that you own at the record date. If you are not contacted by your custodian bank, broker, dealer or other nominee, you should contact your nominee as soon as possible.

What is the over-subscription privilege?

We do not expect all of our stockholders and December 22, 2017 warrant holders to exercise all of such holder’s basic subscription rights. The over-subscription privilege provides each rights holder that exercises all of such rights holder’s basic subscription rights the opportunity to purchase the units that are not purchased by other holders of common stock and participating warrants. If you fully exercise your basic subscription right, the over-subscription privilege of each right entitles you to subscribe for additional units unclaimed by other holders of rights in the rights offering at the same subscription price per unit. If an insufficient number of units are available to fully satisfy all over-subscription privilege requests, the available units will be distributed proportionately among holders of common stock and participating warrants who exercise their over-subscription privileges based on the number of units each rights holder subscribed for under the basic subscription right.

In order to properly exercise your over-subscription privilege, you must deliver the subscription payment for exercise of your over-subscription privilege before the expiration of the rights offering. Because we will not know the total number of unsubscribed units before the expiration of the rights offering, if you wish to maximize the number of units you purchase pursuant to your over-subscription privilege, you will need to deliver payment in an amount equal to the aggregate subscription price for the maximum number of units available, assuming that no stockholder other than you has purchased any units pursuant to such stockholder’s basic subscription right and over-subscription privilege. The subscription agent will return any excess payments by mail without interest or deduction promptly after the expiration of the subscription period. See “*The Rights Offering—The Subscription Rights— Over-Subscription Privilege.*”

May the subscription rights that I exercise be reduced for any reason?

Yes. While we are distributing to holders of our common stock one subscription right for each share of common stock owned on the record date, we are only seeking to raise \$25 million dollars in gross proceeds in this rights offering. As a result, based on 2,651,952 shares of common stock outstanding as of May 2, 2018 and 883,333 shares of common stock issuable upon exercise of warrants issued December 22, 2017, we would grant subscription rights to acquire 3,535,285 units but will only accept subscriptions for 25,000 units. Accordingly, sufficient units may not be available to honor your subscription in full. If exercises of basic subscription rights exceed the number of units available in the rights offering, we will allocate the available units pro-rata among the record holders exercising the basic subscription rights in proportion to the number of shares of our common stock each of those record holders owned on the record

date (including shares of common stock issuable upon exercise of the December 22, 2017 warrants), relative to the number of shares owned on the record date by all record holders exercising the basic subscription right. If this pro-rata allocation results in any record holders receiving a greater number of units than the record holder subscribed for pursuant to the exercise of the basic subscription rights, then such record holder will be allocated only that number of units for which the record holder subscribed, and the remaining units will be allocated among all other record holders exercising their basic subscription rights on the same pro rata basis described above. The proration process will be repeated until all units have been allocated. Please also see the discussion under “*The Rights Offering—The Subscription Rights—Over-Subscription Privilege*” and “*The Rights Offering—Limitation on the Purchase of Units*” for a description of potential proration as to the over-subscription privilege and certain stock ownership limitations.

If for any reason the amount of units allocated to you is less than you have subscribed for, then the excess funds held by the subscription agent on your behalf will be returned to you, without interest, as soon as practicable after the rights offering has expired and all prorating calculations and reductions contemplated by the terms of the rights offering have been effected, and we will have no further obligations to you.

Will fractional shares be issued upon exercise of subscription rights?

No. We will distribute subscription rights to acquire whole units, rounding down the underlying number of common shares giving rise to such subscription rights to the nearest share. Any excess subscription payments received by the subscription agent will be returned within 10 business days after expiration of the rights offering, without interest or deduction. No fractional shares will be issued upon the conversion of the Series B Convertible Preferred Stock or upon exercise of warrants.

What are the terms of the Series B Convertible Preferred Stock?

Each share of Series B Convertible Preferred Stock will be convertible, at our option at any time on or after the first anniversary of the closing of the rights offering or at the option of the holder at any time, into the number of shares of our common stock determined by dividing the \$1,000 stated value per share of the Series B Convertible Preferred Stock by a conversion price of \$3.52 per share, subject to adjustment. The Series B Convertible Preferred Stock has certain conversion rights and dividend rights as described in more detail herein. We do not currently intend to list the Series B Convertible Preferred Stock on any securities exchange or recognized trading system.

What are the terms of the warrants?

Each warrant entitles the holder to purchase one share of common stock at an exercise price of \$4.05 per share from the date of issuance through its expiration four years from the date of issuance. The warrants will be exercisable for cash, or, solely during any period when a registration statement for the exercise of the warrants is not in effect, on a cashless basis. We may redeem the warrants for \$0.18 per warrant if the VWAP of our common stock equals or exceeds \$10.56 per share for ten consecutive trading days, provided that we may not do so prior to the first anniversary of closing of the rights offering. The warrants will be issued in registered form under a warrant agent agreement with VStock Transfer, LLC as warrant agent.

Are the warrants listed?

We do not intend to list the warrants on any securities exchange or recognized trading system.

Will fractional shares be issued upon the conversion of shares of Series B Convertible Preferred Stock or the exercise of warrants?

No fractional shares of common stock will be issued as a result of the conversion of shares of Series B Convertible Preferred Stock or the exercise of warrants. Instead, for any such fractional share that would otherwise have been issuable upon conversion of shares of Series B Convertible Preferred Stock, the Company may, at its election, pay a cash payment equal to such fraction multiplied by the conversion price or round up to the next whole share, and for any such fractional share that would have otherwise been issued upon exercise of warrants, the Company will round up such fraction to the next whole share.

How was the subscription price determined?

The Board determined the subscription price based on a variety of factors, including historical and current trading prices for our common stock, general business conditions, our need for capital, alternatives available to us for raising capital, potential market conditions, and our desire to provide an opportunity to our stockholders and warrant holders as of December 22, 2017, to participate in the rights offering on a pro rata basis. In conjunction with its review of these factors, the Board also reviewed our history and prospects, including our past and present earnings, our prospects for future earnings, and the outlook for our industry, and our current financial condition.

The subscription price is not necessarily related to our book value, tangible book value, multiple of earnings or any other established criteria of value and may or may not be considered the fair value of our common stock to be offered in the rights offering. You should not consider the subscription price as an indication of value of the Company or our common stock. There is currently no market for our shares of Series B Convertible Preferred Stock and, unless we or you choose to convert such shares into shares of common stock, you will not be able to resell such shares. We cannot predict the price at which our shares of common stock will trade. You should obtain a current quote for our common stock before exercising your subscription rights and make your own assessment of our business and financial condition, our prospects for the future, and the terms of the rights offering.

If I am a holder of only stock options or warrants (other than warrants issued on December 22, 2017), may I participate in the rights offering?

Only holders of common stock issued and holders of warrants issued on December 22, 2017, as of the record date, may participate in the rights offering. Following the consummation of the rights offering, the Company may make an equitable adjustment to unexercised stock options to reflect the issuance of shares in the rights offering.

Am I required to exercise all of the subscription rights I receive in the rights offering?

No. You may exercise any number of your subscription rights, or you may choose not to exercise any subscription rights. If you do not exercise any subscription rights, the number of shares of our common stock you own will not change; however, upon conversion of the Series B Convertible Preferred Stock and exercise of the warrants offered hereby, you will own a smaller proportional interest in the Company than if you had timely exercised all or a portion of your subscription rights. If you choose not to exercise your subscription rights or you exercise fewer than all of your subscription rights and other holders of common stock and participating warrants fully exercise their subscription rights or exercise a greater proportion of their subscription rights than you exercise, the percentage of our common stock owned by these other holders of common stock and participating warrants will increase relative to your ownership percentage, and your voting and other rights in the Company will likewise be diluted. In addition, if you do not exercise your basic subscription right in full, you will not be entitled to participate in the over-subscription privilege.

How soon must I act to exercise my subscription rights?

If you received a rights certificate and elect to exercise any or all of your subscription rights, the subscription agent must receive your completed and signed rights certificate and payment (and your payment must clear) prior to the expiration of the rights offering, which is May 24, 2018, at 5:00 p.m., Eastern Time. If you hold your shares or participating warrants in the name of a custodian bank, broker, dealer or other nominee, your nominee may establish a deadline prior to 5:00 p.m., Eastern Time, on May 24, 2018 by which you must provide it with your instructions to

exercise your subscription rights and payment for your units. Our Board may, in its discretion, extend the rights offering one or more times. Our Board may cancel or amend the rights offering at any time before its expiration. In the event that the rights offering is cancelled, all subscription payments received will be returned promptly, without interest or penalty.

Although we will make reasonable attempts to provide this prospectus to holders of subscription rights, the rights offering and all subscription rights will expire at 5:00 p.m., Eastern Time, on May 24, 2018 (unless extended), whether or not we have been able to locate each person entitled to subscription rights.

All exercises of subscription rights are irrevocable, even if the rights offering is extended by our board of directors.

May I transfer my subscription rights?

No. You may not sell, transfer or assign your subscription rights to anyone. Subscription rights will not be listed for trading on the NASDAQ Capital Market or any other stock exchange or market. Rights certificates may only be completed by the stockholder or holder of December 22, 2017 warrants who receives them.

Are we requiring a minimum subscription to complete the rights offering?

There is no aggregate minimum we must receive to complete the rights offering.

Has our Board made a recommendation to our holders of common stock and participating warrants regarding the rights offering?

No. Our Board is not making a recommendation regarding your exercise of the subscription rights. Holders of common stock and participating warrants who exercise subscription rights risk investment loss on new money invested. There is currently no market for our shares of Series B Convertible Preferred Stock and, unless we or you choose to convert your shares of Series B Convertible Preferred Stock into shares of common stock, you will not be able to resell such shares. We cannot predict the price at which our shares of common stock will trade. On May 2, 2018, the last reported sale price of our common stock on Nasdaq was \$3.83 per share. You are urged to make your decision based on your own assessment of our business and the rights offering. Please see “*Risk Factors*” in this prospectus and all other information included in, or incorporated by reference into, this prospectus for a discussion of some of the risks involved in investing in our common stock.

How do I exercise my subscription rights if I own shares in certificate form or if I own warrants issued in the December 22, 2017 financing?

If you hold an ATOS stock certificate or a December 22, 2017 warrant and you wish to participate in the rights offering, you must take the following steps:

deliver a complete and executed rights certificate and related subscription documents to the subscription agent on or before 5:00 p.m. Eastern Time, on May 24, 2018; and

deliver payment to the subscription agent on or before 5:00 p.m. Eastern Time, on May 24, 2018. Payment instructions will accompany your rights certificate.

In certain cases, you may be required to provide additional documentation or signature guarantees.

Please follow the delivery instructions on the rights certificate. Do not deliver documents to the Company. You are solely responsible for completing delivery to the subscription agent of your subscription documents, rights certificate and payment. We urge you to allow sufficient time for delivery of your subscription materials to the subscription agent so that the subscription agent receives the materials before 5:00 p.m., Eastern Time, on May 24, 2018.

If you send a payment that is insufficient to purchase the number of units you requested, or if the number of units you requested is not specified in the forms, the payment received will be applied to exercise your subscription rights to the fullest extent possible based on the amount of the payment received, subject to the availability of units in the rights offering and the elimination of fractional shares. Any excess subscription payments received by the subscription agent will be returned promptly, without interest, following the expiration of the rights offering.

What should I do if I want to participate in the rights offering, but my shares or participating warrants are held in the name of a custodian bank, broker, dealer or other nominee?

If you hold your shares of common stock or participating warrants through a custodian bank, broker, dealer or other nominee, then your nominee is the record holder of the shares (or shares issuable upon exercise of participating warrants) you own. If you are not contacted by your nominee, you should contact your nominee as soon as possible. Your nominee must exercise the subscription rights on your behalf for the units you wish to purchase. You will not receive a rights certificate. Please follow the instructions of your nominee. Your nominee may establish a deadline that may be before 5:00 p.m., Eastern Time, on May 24, 2018, the expiration date for the rights offering.

What form of payment is required to purchase units?

As described in the instructions accompanying the rights certificate, payments submitted to the subscription agent must be made in full United States currency by personal or certified check payable to Broadridge Corporate Issuer Solutions, Inc., the subscription agent, drawn upon a United States bank; U.S. Postal money order; or wire transfer.

If payment is issued by check, payment will be deemed to have been received by the subscription agent only upon the subscription agent's receipt of the check, receipt and clearance of such check.

Please note that funds paid by uncertified personal check may take at least seven business days to clear. Accordingly, if you wish to pay by means of an uncertified personal check, we urge you to make payment sufficiently in advance of the expiration date to ensure that the subscription agent receives cleared funds before that time.

When will I receive my new shares of Series B Convertible Preferred Stock and Warrants?

All shares that you purchase in the rights offering to which you are entitled will be issued in book-entry, or uncertificated, form. When issued, the shares will be registered in the name of the subscription rights holder of record. As soon as practicable after the expiration of the rights offering period, the subscription agent will arrange for the issuance of the shares of Series B Convertible Preferred Stock purchased in the rights offering. Subject to state securities laws and regulations, we have the discretion to delay distribution of any shares you may have elected to purchase by exercise of your rights in order to comply with state securities laws.

After I send in my payment and rights certificate, may I cancel my exercise of subscription rights?

No. All exercises of subscription rights are irrevocable unless the rights offering is terminated, even if you later learn information about us or the rights offering that you consider to be unfavorable to the exercise of your subscription rights. You should not exercise your subscription rights unless you are certain that you wish to purchase units in the rights offering.

Will our directors and officers participate in the rights offering?

All holders of our common stock and holders of our December 22, 2017 warrants as of the record date for the rights offering will receive, at no charge, the non-transferable subscription rights to purchase shares of Series B Convertible Preferred Stock and warrants as described in this prospectus. To the extent that our directors and officers held shares of our common stock (including shares of restricted common stock) as of the record date, they will receive the subscription rights and, while they are under no obligation to do so, will be entitled to participate in the rights offering. Our directors and officers have not indicated to us whether they will participate in the offering pursuant to their basic subscription rights.

Will the equity awards of our employees, officers and directors automatically convert into common stock in connection with the rights offering?

Holders of our equity awards to employees, officers and directors, including outstanding stock options, will not receive rights in the rights offering in connection with such equity awards, but will receive subscription rights in connection with any shares of our common stock held as of the record date.

How will the rights offering affect our outstanding common stock?

As of May 2, 2018, following a one-for-twelve reverse stock split approved by our stockholders on April 19, 2018, we had 2,651,952 shares of our common stock outstanding and 883,333 shares of common stock issuable upon exercise of December 22, 2017 warrants. Assuming no additional shares of common stock are issued by the Company prior to consummation of the rights offering and assuming all units are sold in the rights offering, we will have in addition to our previously issued and outstanding securities, 25,000 shares of Series B Convertible Preferred Stock outstanding, and warrants to purchase an additional 7,100,000 shares of our common stock outstanding.

The issuance of Series B Convertible Preferred Stock and warrants exercisable for shares of our common stock in the rights offering will dilute, and thereby reduce, your proportionate ownership in the Company unless you fully exercise your basic subscription rights.

How much will the Company receive in net proceeds from the rights offering?

We expect the aggregate proceeds, net of dealer-manager fees and other fees and expenses, from the rights offering will be approximately \$23 million, assuming all rights are exercised. We intend to use the net proceeds to provide for our general corporate purposes. Please see “*Use of Proceeds*.”

Are there risks in exercising my subscription rights?

Yes. The exercise of your subscription rights involves risks. Exercising your subscription rights involves the purchase of our securities and should be considered as carefully as you would consider any other equity investment. Among other things, you should carefully consider the risks described under the heading “*Risk Factors*” in this prospectus and all other information included in, or incorporated by reference into, this prospectus.

Can the Board terminate or extend the rights offering?

Yes. Our Board may decide to terminate the rights offering at any time and for any reason before the expiration of the rights offering. We also have the right to extend the rights offering for additional periods in our sole discretion. We do not presently intend to extend the rights offering. We will notify holders of common stock and participating warrants and the public if the rights offering is terminated or extended by issuing a press release announcing the extension no later than 9:00 a.m., Eastern Time, on the next business day after the most recently announced expiration date of the rights offering.

If the rights offering is not completed, will my subscription payment be refunded to me?

Yes. The subscription agent will hold all funds it receives in a designated bank account until the rights offering is completed. If the rights offering is not completed, all subscription payments received by the subscription agent will be returned promptly, without interest or penalty. If your shares or participating warrants are held in the name of a custodian bank, broker, dealer or other nominee, it may take longer for you to receive the refund of your subscription payment than if you were a record holder of your shares because the subscription agent will return payments through

the record holder of your shares.

Will I receive interest on any funds I deposit with the subscription agent?

No. You will not be entitled to any interest on any funds that are deposited with the subscription agent pending completion or cancellation of the rights offering. If the rights offering is cancelled for any reason, the subscription agent will return this money to subscribers, without interest or penalty, as soon as practicable.

How do I exercise my rights if I live outside of the United States?

The subscription agent will hold rights certificates for holders of common stock and participating warrants having addresses outside of the United States. In order to exercise subscription rights, foreign holders of common stock and participating warrants must notify the subscription agent and timely follow the procedures described in “*The Rights Offering—Foreign Stockholders*.”

What are the U.S. federal income tax consequences of exercising my subscription rights?

We believe that the receipt and exercise of subscription rights by holders of shares of our common stock and holders of participating warrants should generally not be taxable for U.S. federal income tax purposes. You should seek specific tax advice from your tax advisor in light of your particular circumstances and as to the applicability and effect of any other tax laws. See “*Material U.S. Federal Income Tax Consequences*.”

What fees or charges apply if I purchase units in the rights offering?

We are not charging any fee or sales commission to issue subscription rights to you or to issue units to you if you exercise your subscription rights (other than the subscription price). If you exercise your subscription rights through a custodian bank, broker, dealer or other nominee, you are responsible for paying any fees your nominee may charge you.

Whom should I contact if I have other questions?

If you have other questions regarding the rights offering, please contact the subscription agent, Broadridge Corporate Issuer Solutions, Inc., toll free at (855) 793-5068, or by mail at Broadridge Corporate Issuer Solutions, Inc., Attn: BCIS Re-Organization Dept., P.O. Box 1317, Brentwood, New York, 11717-0693.

To whom should I send my forms and payment?

If your shares or participating warrants are held in the name of a broker, dealer, custodian bank or other nominee, then you should send your subscription documents and subscription payment to that record holder. If you are the record holder, then you should send your subscription documents, rights certificate, or subscription payment to the address provided below. If sent by mail, we recommend that you send documents and payments by registered mail, properly insured, with return receipt requested, and that a sufficient number of days be allowed to ensure delivery to the subscription agent. Do not send or deliver these materials to the Company.

By Mail

Broadridge Corporate Issuer Solutions, Inc.
Attn: BCIS Re-Organization Dept.
P.O. Box 1317
Brentwood, New York 11717-0693
(855) 793-5068 (toll free)

By Hand or Overnight Courier

Broadridge Corporate Issuer Solutions, Inc.
Attn: BCIS IWS
51 Mercedes Way
Edgewood, New York 11717
(855) 793-5068 (toll free)

You, or, if applicable, your nominee, are solely responsible for ensuring the subscription agent receives your subscription documents, rights certificate, and subscription payment. You should allow sufficient time for delivery of your subscription materials to the subscription agent and clearance of payment before the expiration of the rights offering period.

Who is the dealer-manager?

Maxim Group LLC will act as dealer-manager for the rights offering. Under the terms and subject to the conditions contained in the dealer-manager agreement, the dealer-manager will use its best efforts to solicit the exercise of subscription rights. We have agreed to pay the dealer-manager certain fees for acting as dealer-manager and to reimburse the dealer-manager for certain out-of-pocket expenses incurred in connection with this offering. The dealer-manager is not underwriting or placing any of the subscription rights or the shares of Series B Convertible Preferred stock or warrants being issued in the rights offering and is not making any recommendation with respect to such subscription rights (including with respect to the exercise or expiration of such subscription rights), shares of Series B Convertible Preferred Stock or warrants.

RISK FACTORS

Investing in our securities involves a high degree of risk. Before making an investment decision with respect to our securities, we urge you to carefully consider the risks described in the “Risk Factors” section of our Annual Report on Form 10-K for the year ended December 31, 2017, which is incorporated by reference into this prospectus. These risk factors relate to our business, intellectual property, regulatory matters, and ownership of our common stock. In addition, the following risk factors present material risks and uncertainties associated with the rights offering. The risks and uncertainties incorporated by reference into this prospectus or described below are not the only ones we face. Additional risks and uncertainties not presently known or which we consider immaterial as of the date hereof may also have an adverse effect on our business. If any of the matters discussed in the following risk factors were to occur, our business, financial condition, results of operations, cash flows or prospects could be materially adversely affected, the market price of our securities could decline and you could lose all or part of your investment in our securities.

Risks Related to the Rights Offering

Future sales of our common stock may depress our share price.

As of May 2, 2018, following a one-for-12 reverse stock split that was approved by our stockholders on April 19, 2018, we had 2,651,952 shares of our common stock outstanding. Sales of a number of shares of common stock in the public market, or the issuance of additional shares upon exercise of outstanding warrants, could cause the market price of our common stock to decline. We may also sell additional common stock or securities convertible into or exercisable or exchangeable for common stock in subsequent public or private offerings or other transactions, which may adversely affect the market price of our common stock.

We presently do not intend to pay cash dividends on our common stock.

We have never paid cash dividends in the past, and we currently anticipate that no cash dividends will be paid on the common stock in the foreseeable future.

Our stockholders may experience substantial dilution in the value of their investment if we issue additional shares of our capital stock.

Our charter allows us to issue up to 175,000,000 shares of our common stock, par value \$0.18 per share, and to issue and designate the rights of, without stockholder approval, up to 10,000,000 shares of preferred stock, par value \$0.001 per share. On April 19, 2018, our stockholders approved an increase in the authorized number of shares of our common stock from 75,000,000 to 175,000,000, as well as a one-for-twelve reverse stock split. To raise additional capital, we may in the future sell additional shares of our common stock or other securities convertible into or exchangeable for our common stock at prices that are lower than the prices paid by existing stockholders, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders, which could result in substantial dilution to the interests of existing stockholders.

We may issue debt and equity securities or securities convertible into equity securities, any of which may be senior to our common stock as to distributions and in liquidation, which could negatively affect the value of our common stock.

In the future, we may attempt to increase our capital resources by entering into debt or debt-like financing that is unsecured or secured by up to all of our assets, or by issuing additional debt or equity securities, which could include issuances of secured or unsecured commercial paper, medium-term notes, senior notes, subordinated notes, guarantees, preferred stock, hybrid securities, or securities convertible into or exchangeable for equity securities. In the event of our liquidation, our lenders and holders of our debt and preferred securities would receive distributions of our available assets before distributions to the holders of our common stock. Because our decision to incur debt and issue securities in future offerings may be influenced by market conditions and other factors beyond our control, we cannot predict or estimate the amount, timing or nature of our future offerings or debt financings. Further, market conditions could require us to accept less favorable terms for the issuance of our securities in the future.

Our management will have broad discretion over the use of the net proceeds from this offering, you may not agree with how we use the proceeds and the proceeds may not be invested successfully.

Our management will have broad discretion as to the use of the net proceeds from this offering and could use them for purposes other than those contemplated at the time of commencement of this offering. Accordingly, you will be relying on the judgment of our management with regard to the use of these net proceeds, and you will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. It is possible that, pending their use, we may invest the net proceeds in a way that does not yield a favorable, or any, return for us. The failure of our management to use such funds effectively could have a material adverse effect on our business, financial condition, operating results and cash flows.

Your interest in our company may be diluted as a result of this rights offering.

Holders of common stock and participating warrants who do not fully exercise their subscription rights should expect that they will, at the completion of this offering, own a smaller proportional interest in our company than would otherwise be the case had they fully exercised their subscription rights. Further, the shares issuable upon the exercise of the warrants to be issued pursuant to the rights offering will dilute the ownership interest of stockholders not participating in this offering or holders of warrants who have not exercised them.

Further, if you purchase units in this offering at the subscription price, you may suffer immediate and substantial dilution in the net tangible book value of our common stock. See “*Dilution*” in this prospectus for a more detailed discussion of the dilution which may incur in connection with this offering.

We may be or become the target of securities litigation, which is costly and time-consuming to defend.

In the past, following periods of market volatility in the price of a company’s securities or the reporting of unfavorable news, security holders have often instituted class action litigation. If the market value of our securities experience adverse fluctuations and we become involved in this type of litigation, regardless of the outcome, we could incur substantial legal costs and our management’s attention could be diverted from the operation of our business, causing our business to suffer.

There may be future sales or other dilution of our equity, which may adversely affect the market price of our common stock.

We are generally not restricted from issuing additional common stock, including any securities that are convertible into or exchangeable for, or that represent the right to receive, common stock. The market price of our common stock could decline as a result of sales of common stock or securities that are convertible into or exchangeable for, or that represent the right to receive, common stock after this rights offering or the perception that such sales could occur. For example, we have a currently effective registration statement that permits us to sell shares of our common stock from time to time at prevailing market prices, which could result in dilution to investors in the rights offering.

Completion of the rights offering is not subject to us raising a minimum offering amount.

Completion of the rights offering is not subject to us raising a minimum offering amount and, therefore, proceeds may be insufficient to meet our objectives, thereby increasing the risk to investors in this offering, including investing in a company that continues to require capital. See “*Use of Proceeds*.”

This rights offering may cause the trading price of our common stock to decrease.

The subscription price, together with the number of shares of common stock issuable upon conversion of the Series B Convertible Preferred Stock and warrants issuable in this rights offering, may result in an immediate decrease in the market price of our common stock. This decrease may continue after the completion of this rights offering. If that occurs, you may have committed to buy shares of our Series B Convertible Preferred Stock which are convertible into shares of our common stock at a price greater than the prevailing market price. We cannot predict the effect, if any, that the availability of shares for future sale represented by the warrants issued in connection with the rights offering will have on the market price of our common stock from time to time. Further, if a substantial number of subscription rights are exercised and the holders of the shares received upon exercise of those subscription rights or the related warrants choose to sell some or all of the shares underlying the subscription rights or the related warrants, the resulting sales could depress the market price of our common stock.

Holders of our warrants will have no rights as a common stockholder until such holders exercise their warrants and acquire our common stock.

Until holders of warrants acquire shares of our common stock upon exercise of the warrants, holders of warrants will have no rights with respect to the shares of our common stock underlying such warrants. Upon exercise of the warrants, the holders thereof will be entitled to exercise the rights of a common stockholder only as to matters for which the record date occurs after the exercise date.

If we terminate this offering for any reason, we will have no obligation other than to return subscription monies within 10 business days.

We may decide, in our sole discretion and for any reason, to cancel or terminate the rights offering at any time prior to the expiration date. If this offering is cancelled or terminated, we will have no obligation with respect to subscription rights that have been exercised except to return within 10 business days, without interest or deduction, all subscription payments deposited with the subscription agent. If we terminate this offering and you have not exercised any subscription rights, such subscription rights will expire and be worthless.

The subscription price determined for this offering is not an indication of the fair value of our common stock.

In determining the subscription price, our board of directors considered a number of factors, including, but not limited to, our need to raise capital in the near term to continue our operations, the current and historical trading prices of our common stock, a price that would increase the likelihood of participation in the rights offering, the cost of capital from

other sources, the value of the Series B Convertible Preferred Stock and warrants being issued as components of the unit, comparable precedent transactions, an analysis of stock price trading multiples for companies similar to us that, among other things, did not need to raise capital in the near-term, and our most recently forecasted revenue relative to our peer group. The subscription price does not necessarily bear any relationship to any established criteria for value. No valuation consultant or investment banker has opined upon the fairness or adequacy of the subscription price. You should not consider the subscription price as an indication of the value of our company or our common stock.

If you do not act on a timely basis and follow subscription instructions, your exercise of subscription rights may be rejected.

Holders of subscription rights who desire to purchase shares of our Series B Convertible Preferred Stock and warrants in this offering must act on a timely basis to ensure that all required forms and payments are actually received by the subscription agent prior to 5:00 p.m., Eastern Time, on the expiration date, unless extended. If you are a beneficial owner of shares of common stock and you wish to exercise your subscription rights, you must act promptly to ensure that your broker, dealer, bank, trustee or other nominee acts for you and that all required forms and payments are actually received by your broker, dealer, bank, trustee or other nominee in sufficient time to deliver such forms and payments to the subscription agent to exercise the subscription rights granted in this offering that you beneficially own prior to 5:00 p.m., Eastern Time on the expiration date, as may be extended. We will not be responsible if your broker, dealer, bank, trustee or other nominee fails to ensure that all required forms and payments are actually received by the subscription agent prior to 5:00 p.m., Eastern Time, on the expiration date.

If you fail to complete and sign the required subscription forms, send an incorrect payment amount, or otherwise fail to follow the subscription procedures that apply to your exercise in this rights offering, the subscription agent may, depending on the circumstances, reject your subscription or accept it only to the extent of the payment received. Neither we nor the subscription agent undertakes to contact you concerning an incomplete or incorrect subscription form or payment, nor are we under any obligation to correct such forms or payment. We have the sole discretion to determine whether a subscription exercise properly follows the subscription procedures.

You may not receive all of the units for which you subscribe.

While we are distributing to holders of our common stock and holders of our December 22, 2017 warrants one subscription right for each share of common stock owned on the Record Date (including shares of common stock issuable upon exercise of the December 22, 2017 warrants), we are only seeking to raise \$25 million dollars in gross proceeds in this rights offering. As a result, based on 2,651,952 shares of common stock outstanding and 883,333 shares of common stock issuable upon exercise of warrants issued December 22, 2017 as of May 2, 2018, we would grant subscription rights to acquire 3,535,285 units but will only accept subscriptions for 25,000 units. Accordingly, sufficient units may not be available to honor your subscription in full. If excess units are available after the exercise of basic subscription rights, holders who fully exercise their basic subscription rights will be entitled to subscribe for an additional number of units. Over-subscription privileges will be allocated pro rata among holders of common stock and participating warrants who over-subscribed, based on the number of over-subscription units to which they have subscribed. We cannot guarantee that you will receive any or the entire amount of units for which you subscribed. If for any reason the amount of units allocated to you is less than you have subscribed for, then the excess funds held by the subscription agent on your behalf will be returned to you, without interest, as soon as practicable after the rights offering has expired and all prorating calculations and reductions contemplated by the terms of the rights offering have been effected, and we will have no further obligations to you.

Unless we otherwise agree in writing, a person or entity, together with related persons or entities, may not exercise subscription rights (including over-subscription privileges) to purchase units that, when aggregated with their existing ownership, would result in such person or entity, together with any related persons or entities, owning in excess of 19.99% of our issued and outstanding shares of common stock following the closing of the transactions contemplated by this rights offering. If the amount of units allocated to you is less than your subscription request, then the excess funds held by the subscription agent on your behalf will be returned to you, without interest, as soon as practicable after the rights offering has expired and all prorating calculations and reductions contemplated by the terms of the rights offering have been effected, and we will have no further obligations to you.

If you make payment of the subscription price by personal check, your check may not clear in sufficient time to enable you to purchase units in this rights offering.

Any personal check used to pay for shares and warrants to be issued in this rights offering must clear prior to the expiration date of this rights offering, and the clearing process may require five or more business days. If you choose

to exercise your subscription rights, in whole or in part, and to pay for shares and warrants by personal check and your check has not cleared prior to the expiration date of this rights offering, you will not have satisfied the conditions to exercise your subscription rights and will not receive the shares and warrants you wish to purchase.

The receipt of subscription rights may be treated as a taxable distribution to you.

We believe the distribution of the subscription rights in this rights offering should be a non-taxable distribution to holders of shares of our common stock and holders of participating warrants under Section 305(a) of the Internal Revenue Code of 1986, as amended, or the Code. Please see the discussion on the “*Material U.S. Federal Income Tax Consequences*” below. This position is not binding on the IRS, or the courts, however. If this rights offering is deemed to be part of a “disproportionate distribution” under Section 305 of the Code, your receipt of subscription rights in this offering may be treated as the receipt of a taxable distribution to you equal to the fair market value of the subscription rights. Any such distribution would be treated as dividend income to the extent of our current and accumulated earnings and profits, if any, with any excess being treated as a return of capital to the extent thereof and then as capital gain. Each holder of shares of common stock and each holder of participating warrants is urged to consult his, her or its own tax advisor with respect to the particular tax consequences of this rights offering.

Exercising the subscription rights limits your ability to engage in certain hedging transactions that could provide you with financial benefits.

By exercising the subscription rights, you are representing to us that you have not entered into any short sale or similar transaction with respect to our common stock since the record date for the rights offering. In addition, the subscription rights provide that, upon exercise of the subscription right, you agree not to enter into any short sale or similar transaction with respect to our common stock for so long as you continue to hold warrants issued in connection with the exercise of the subscription right. These requirements prevent you from pursuing certain investment strategies that could provide you greater financial benefits than you might have realized if the subscription rights did not contain these requirements.

The subscription rights are not transferable, and there is no market for the subscription rights.

You may not sell, transfer, assign or give away your subscription rights. Because the subscription rights are non-transferable, there is no market or other means for you to directly realize any value associated with the subscription rights. You must exercise the subscription rights to realize any potential value from your subscription rights.

Absence of a public trading market for the warrants may limit your ability to resell the warrants.

There is no established trading market for the warrants to be issued pursuant to this offering, and the warrants may not be widely distributed. We do not intend to list the warrants for trading on any securities exchange or recognized trading system. Even if a market for the warrants does develop, the price of the warrants may fluctuate and liquidity may be limited. Future trading prices of the warrants will depend on many factors, including:

our operating performance and financial condition;

our ability to continue the effectiveness of the registration statement, of which this prospectus is a part, covering the warrants and the common stock issuable upon exercise of the warrants;

the interest of securities dealers in making a market; and

the market for similar securities.

There is no public market for the Series B Convertible Preferred Stock in this offering.

There is no established public trading market for the Series B Convertible Preferred Stock, and we do not expect a market to develop. In addition, we do not currently intend to apply for listing of the Series B Convertible Preferred Stock on any securities exchange or recognized trading system.

The market price of our common stock may never exceed the exercise price of the warrants issued in connection with this offering.

The warrants being issued in connection with this offering become exercisable upon issuance and will expire four years from the date of issuance. The market price of our common stock may never exceed the exercise price of the warrants prior to their date of expiration. Any warrants not exercised by their date of expiration will expire worthless and we will be under no further obligation to the warrant holder.

The warrants contain features that may reduce your economic benefit from owning them.

The warrants contain features that allow us to redeem the warrants and that prohibit you from engaging in certain investment strategies. We may redeem the warrants for \$0.18 per warrant once the VWAP of our common stock equals or exceeds \$10.56 per share for ten consecutive trading days, provided that we may not do so prior to the first anniversary of closing of the rights offering, and only upon not less than 30 days' prior written notice of redemption. If we give notice of redemption, you will be forced to sell or exercise your warrants or accept the redemption price. The notice of redemption could come at a time when it is not advisable or possible for you to exercise the warrants. As a result, you may be unable to benefit from owning the warrants being redeemed. In addition, for so long as you continue to hold warrants, you will not be permitted to enter into any short sale or similar transaction with respect to our common stock. This could prevent you from pursuing investment strategies that could provide you greater financial benefits from owning the warrant.

The dealer-manager is not underwriting, nor acting as placement agent of, the subscription rights or the securities underlying the subscription rights.

Maxim Group LLC will act as dealer-manager for this rights offering. As provided in the dealer-manager agreement, the dealer-manager will provide marketing assistance in connection with this offering. The dealer-manager is not underwriting or placing any of the subscription rights or the shares of our Series B Convertible Preferred Stock or warrants being issued in this offering and is not making any recommendation with respect to such subscription rights (including with respect to the exercise or expiration of such subscription rights), shares or warrants. The dealer-manager will not be subject to any liability to us in rendering the services contemplated by the dealer-manager agreement except for any act of bad faith or gross negligence by the dealer-manager. The rights offering may not be successful despite the services of the dealer-manager to us in this offering.

Since the warrants are executory contracts, they may have no value in a bankruptcy or reorganization proceeding.

In the event a bankruptcy or reorganization proceeding is commenced by or against us, a bankruptcy court may hold that any unexercised warrants are executory contracts that are subject to rejection by us with the approval of the bankruptcy court. As a result, holders of the warrants may, even if we have sufficient funds, not be entitled to receive any consideration for their warrants or may receive an amount less than they would be entitled to if they had exercised their warrants prior to the commencement of any such bankruptcy or reorganization proceeding.

Risks Related to Our Business

Investors should carefully consider the risks and uncertainties and all other information contained or incorporated by reference in this prospectus, including the risks and uncertainties discussed under “*Risk Factors*” in our most recent Annual Report on Form 10-K, as may be amended from time to time, and in subsequent filings that are incorporated herein by reference. All of these risk factors are incorporated by reference herein in their entirety. These risks and uncertainties are not the only ones facing us. Our business, financial condition or results of operations could be materially adversely affected by any of these risks. The trading price of our common stock could decline due to any of these risks, and you may lose all or part of your investment. This prospectus and the incorporated documents also contain forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks mentioned in this prospectus.

USE OF PROCEEDS

We will retain broad discretion over the use of the net proceeds from the sale of our securities offered hereby. Except as described in any prospectus supplement, we currently anticipate using the net proceeds from the sale of our securities offered hereby primarily for general corporate purposes, which include, but are not limited to, funding our ongoing and future development of our drugs and devices under development, and for general and administrative expenses. We may also use a portion of the net proceeds to pay off outstanding indebtedness, if any, and/or acquire or invest in complementary businesses, products and technologies. Further, from time to time we may evaluate acquisition opportunities and engage in related discussions with other companies. Pending the use of the net proceeds, we intend to invest the net proceeds in short-term, interest-bearing, investment-grade securities.

MARKET PRICE OF OUR COMMON STOCK AND RELATED STOCKHOLDER MATTERS

Our common stock is traded on the NASDAQ Capital Market under the symbol “ATOS.” Our common stock has, from time to time, traded on a limited, sporadic or volatile basis. The following tables show the high and low sales prices for our common stock for the periods indicated, as reported on the NASDAQ Capital Market. These prices do not reflect retail markups, markdowns or commissions.

	Price Ranges	
	High	Low
Fiscal Year ended December 31, 2018		
First Quarter	\$ 10.68	\$ 3.00
Second Quarter (April 1, 2018 – May 2, 2018)	\$ 5.64	\$ 2.85
Fiscal Year ended December 31, 2017		
First Quarter	\$ 22.20	\$ 9.12
Second Quarter	\$ 9.72	\$ 4.80
Third Quarter	\$ 11.16	\$ 3.84
Fourth Quarter	\$ 19.08	\$ 2.64
Fiscal Year ended December 31, 2016		
First Quarter	\$ 127.80	\$ 25.20
Second Quarter	\$ 73.80	\$ 45.00
Third Quarter	\$ 59.40	\$ 24.00
Fourth Quarter	\$ 31.20	\$ 15.60

The closing price of our common stock on May 2, 2018 was \$3.83 per share. As of March 12, 2018, we had approximately 20,000 record holders of our common stock. Because so many of our shares are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of individual stockholders represented by these record holders.

DIVIDEND POLICY

We have never, and do not anticipate that we will, declare or pay a cash dividend. We expect to retain future earnings, if any, for our business and do not anticipate paying dividends on common stock or our Series B Convertible Preferred Stock at any time in the foreseeable future. Because we do not anticipate paying dividends in the future, the only opportunity for our stockholders to realize the creation of value in our common stock or our Series B Convertible Preferred Stock will likely be through a sale of those shares.

DILUTION

Purchasers of our common stock, which is issuable upon conversion of the Series B Convertible Preferred Stock and upon exercise of the warrants contained in the units, will experience an immediate dilution of the net tangible book value per share of our common stock. Our net tangible book value as of December 31, 2017 was approximately \$6,863,001, or \$2.59 per share of our common stock (based upon 2,651,952 shares of our common stock then outstanding). Net tangible book value per share is equal to our total tangible assets less our total liabilities, divided by the number of shares of our outstanding common stock.

Dilution per share of common stock equals the difference between the subscription price per unit paid by purchasers in the rights offering (ascribing no value to the warrants contained in the units) and the net tangible book value per share of our common stock immediately after the rights offering.

Based on the sale by us in this rights offering of a maximum of 25,000 units (consisting of 25,000 shares of Series B Convertible Preferred Stock and warrants to purchase an aggregate of 7,100,000 shares of common stock upon exercise), at the subscription price of \$1,000 per unit, and after deducting estimated offering expenses and dealer-manager fees and expenses payable by us and assuming no exercise of the warrants, our pro forma net tangible book value as of December 31, 2017 would have been approximately \$29,876,361, or \$3.06 per share. This represents an immediate increase in pro forma net tangible book value to existing stockholders of \$0.47 per share and an immediate dilution to purchasers in the rights offering of \$0.46 per share. The following table illustrates this per-share dilution:

Subscription price	\$ 1,000.00
Net tangible book value per share as of December 31, 2017	\$ 2.59
Increase in net tangible book value per share attributable to rights offering	\$ 0.48
Pro forma net tangible book value per share as of December 31, 2017, after giving effect to rights offering	\$ 3.06
Dilution in net tangible book value per share to purchasers in the rights offering	\$ 0.46

THE RIGHTS OFFERING

All holders of our common stock and holders of December 22, 2017 warrants as of the record date are eligible to participate in the rights offering. Please read through the material terms of the rights offering described in this section. If you hold your shares or participating warrants in a brokerage account or through a broker, dealer, custodian bank or other nominee, please also refer to “—*Method of Exercising Subscription Rights—Subscription by Beneficial Owners.*”

The Subscription Rights

We will distribute to holders of shares of our common stock and warrants issued December 22, 2017 as of 5:00 p.m., Eastern Time on May 9, 2018, the record date for the rights offering, at no charge, non-transferable subscription rights to purchase units, with each unit consisting of one share of Series B Convertible Preferred Stock and 284 warrants at \$1,000 per unit. Each holder of record of our common stock or of December 22, 2017 warrants as of the record date will receive one subscription right for each share of common stock (including shares issuable upon exercise of the December 22, 2017 warrants). Each subscription right will entitle its holder to a basic subscription right and an over-subscription privilege. In the aggregate, the subscription rights entitle our holders of common stock and participating warrants to purchase a total of 25,000 units for a total price of approximately \$25 million. Shares of common stock issued upon conversion of the Series B Convertible Preferred Stock and warrants offered in the rights offering, like existing shares of our common stock, will be traded on the NASDAQ Capital Market under our stock symbol, “ATOS.”

Basic Subscription Right. As described in the foregoing paragraph, the basic subscription right entitles its holder to purchase units, with each unit consisting of one share of Series B Convertible Preferred Stock and 284 warrants at a subscription price of \$1,000 per unit. In order to exercise the basic subscription right, you must deliver the required documents and payment of the subscription price to the subscription agent prior to the expiration of the rights offering. If you choose to exercise your basic subscription rights, you may do so in part or in full. However, you may exercise your over-subscription privilege unless you exercise all of your basic subscription rights.

Over-Subscription Privilege. If you exercise your basic subscription rights in full, you may also choose to exercise your over-subscription privilege. Subject to proration and the limitations described in this prospectus, we will seek to honor the over-subscription requests in full. If over-subscription requests exceed the number of units available, however, we will allocate the available units pro rata among the stockholders as of the record date exercising the over-subscription privilege in proportion to the number of shares of our common stock each of those holders of common stock and participating warrants owned on the record date (including shares of common stock issuable upon conversion of the December 22, 2017 warrants), relative to the number of shares owned on the record date by all holders of common stock and participating warrants as of the record date exercising the over-subscription privilege. If this pro rata allocation results in any rights holder receiving a greater number of units than the record holder subscribed for pursuant to the exercise of the over-subscription privilege, then such record holder will be allocated only that number of units for which the record holder oversubscribed, and the remaining units will be allocated among

all other holders of common stock and participating warrants exercising the over-Subscription Privilege on the same pro rata basis described above. The proration process will be repeated until all units have been allocated.

Broadridge Corporate Issuer Solutions, Inc., the subscription agent for the rights offering, will determine the over-subscription allocation based on the formula described above.

To the extent the aggregate subscription payment of the actual number of unsubscribed units available to you pursuant to the over-subscription privilege is less than the amount you actually paid in connection with the exercise of the over-subscription privilege, you will be allocated only the number of unsubscribed Units available to you, and any excess subscription payments will be returned to you, without interest or deduction, with 10 business days after expiration of the rights offering.

We can provide no assurances that you will actually be entitled to purchase the number of units issuable upon the exercise of your over-subscription privilege in full at the expiration of the rights offering. We will not be able to satisfy any requests for units pursuant to the over-subscription privilege if all of our holders of common stock and participating warrants exercise their basic subscription rights in full, and we will only honor an over-subscription privilege to the extent sufficient units are available following the exercise of basic subscription rights.

Reasons for the Rights Offering

We are conducting the rights offering in order to raise capital for our general capital purposes. Our Board has considered the rights offering to be the best option for raising capital as compared to other alternatives, in part because it will give current holders of common stock and participating warrants the opportunity to limit ownership dilution by buying additional shares of common stock.

Our Board has approved the rights offering and, based on information available to the Board and its subsequent analyses, believes that the rights offering is in the best interests of the Company and its stockholders. However, our Board is not making any recommendation regarding your exercise of the subscription rights.

Determination of Subscription Price

The Board determined the subscription price, after reasonable consultation with the holders of common stock and participating warrants that have agreed to exercise their rights as described below, based on a variety of factors, including historical and current trading prices for our common stock, general business conditions, our need for capital, alternatives available to us for raising capital, potential market conditions, and our desire to provide an opportunity to our holders of common stock and participating warrants to participate in the rights offering on a pro rata basis. In conjunction with its review of these factors, the Board also reviewed our history and prospects, including our past and present earnings, our prospects for future earnings, and the outlook for our industry, and our current financial condition.

The subscription price is not necessarily related to our book value, tangible book value, multiple of earnings or any other established criteria of value and may or may not be considered the fair value of our common stock to be offered in the rights offering. You should not consider the subscription price as an indication of value of the Company or our common stock. There is currently no market for our shares of Series B Convertible Preferred Stock and, unless we or you choose to convert such shares into shares of common stock, you will not be able to resell such shares. We cannot predict the price at which our shares of common stock will trade. You should obtain a current quote for our common stock before exercising your subscription rights and make your own assessment of our business and financial condition, our prospects for the future, and the terms of the rights offering.

No Short-Sales

By exercising the subscription rights, you are representing to us that you have not entered into any short sale or similar transaction with respect to our common stock since the record date for the rights offering. In addition, the subscription

rights provide that, upon exercise of the subscription right, you represent that you have not since the record date and, for so long as you continue to hold warrants issued in connection with the exercise of the subscription right, agree to not to enter into any short sale or similar transaction with respect to our common stock. These requirements prevent you from pursuing certain investment strategies that could provide you greater financial benefits than you might have realized if the subscription rights did not contain these requirements.

No Recombination

The Series B Convertible Preferred Stock and warrants comprising the units will separate upon the exercise of the subscription rights, and the units will not trade as a separate security. Holders may not recombine shares of Series B Convertible Preferred Stock and warrants to receive a unit.

Non-Transferability of Subscription Rights

The subscription rights are non-transferable (other than by operation of law), and as a result, you may not sell, transfer, assign or give away your subscription rights to anyone. The subscription rights will not be listed for trading on any stock exchange or market.

Expiration Date

The subscription period, during which you may exercise your subscription rights, expires at 5:00 p.m., Eastern Time, on May 24, 2018, which is the expiration of the rights offering. If you do not exercise your subscription rights before that time, your subscription rights will expire and will no longer be exercisable. We will not be required to issue shares to you if the subscription agent receives your rights certificate or your subscription payment after that time. We have the option to extend the rights offering in our sole discretion, although we do not presently intend to do so. We may extend the rights offering by giving oral or written notice to the Subscription Agent before the rights offering expires. If we elect to extend the rights offering, we will issue a press release announcing the extension no later than 9:00 a.m., Eastern Time, on the next business day after the most recently announced expiration date of the rights offering.

If you hold your shares of common stock or participating warrants in the name of a broker, dealer, bank or other nominee, the nominee will exercise the subscription rights on your behalf in accordance with your instructions. Please note that the nominee may establish a deadline that may be before 5:00 p.m., Eastern Time, on May 24, 2018, which is the expiration date that we have established for the rights offering.

Termination

We may terminate the rights offering for any reason at any time prior to the completion of the rights offering. If we terminate the rights offering, we will issue a press release notifying holders of common stock and participating warrants and the public of the termination.

Method of Exercising Subscription Rights

You will receive one non-transferable subscription right for each share of our common stock (including shares issuable upon exercise of December 22, 2017 warrants) that you owned as of 5:00 p.m., Eastern Time, on May 9, 2018, the record date for the rights offering. The exercise of subscription rights is irrevocable and may not be cancelled or modified. You may exercise your subscription rights as follows:

Subscription by Registered Holders. If you are a registered holder of shares of our common stock or December 22, 2017 warrants, the number of subscription rights you may exercise is indicated on your rights certificate. You may exercise your subscription rights by properly completing and executing the rights certificate and forwarding it, together with your full payment, to the subscription agent at the address set forth below under “—*Subscription Agent*,” to be received prior to 5:00 p.m., Eastern Time, on May 24, 2018, the expiration date for the rights offering.

Subscription by Beneficial Owners. If you are a beneficial owner of shares of our common stock that are registered in the name of a custodian bank, broker, dealer or other nominee, you will not receive a rights certificate. Instead, one subscription right will be issued to the nominee record holder for each share of our common stock (including shares issuable upon exercise of warrants) that you own at the record date. If you are not contacted by your nominee, you should promptly contact your nominee in order to subscribe for shares of our common stock in the rights offering.

If you hold your shares of common stock or participating warrants in the name of a custodian bank, broker, dealer or other nominee, your nominee will exercise the subscription rights on your behalf in accordance with your instructions. Your nominee may establish a deadline that may be before 5:00 p.m., Eastern Time, on May 24, 2018, the expiration date for the rights offering.

Payment Method

As described in the instructions accompanying the rights certificate, payments submitted to the subscription agent must be made in full United States currency by personal or certified check payable to Broadridge Corporate Issuer Solutions, Inc., the subscription agent, drawn upon a United States bank, U.S. Postal money order, or wire transfer.

If payment is issued by check, payment will be deemed to have been received by the subscription agent only upon the subscription agent's receipt of the check, receipt and clearance of such check.

Please note that funds paid by uncertified personal check may take at least seven business days to clear. Accordingly, if you wish to pay by means of an uncertified personal check, we urge you to make payment sufficiently in advance of the expiration date to ensure that the subscription agent receives cleared funds before that time.

Your subscription rights will not be successfully exercised unless the subscription agent actually receives from you, your custodian bank, broker, dealer or other nominee, as the case may be, all of the required documents and your full subscription price payment (and your payment has cleared) prior to 5:00 p.m., Eastern Time, on May 24, 2018, the scheduled expiration date of the rights offering.

You should read and follow the instructions accompanying the rights certificate carefully. As described in the instructions accompanying the rights certificate, in certain cases additional documentation or signature guarantees may be required.

The method of delivery of payments of the subscription amount to the subscription agent will be at the risk of the holders of subscription rights. If sent by mail, we recommend that you send those documents and payments by registered mail, properly insured, with return receipt requested, and that a sufficient number of days be allowed to ensure timely delivery to the subscription agent. Do not send or deliver these materials to the Company.

There is no sales fee or commission payable by you in connection with the issuance of subscription rights or the issuance of shares of common stock if you exercise your subscription rights (other than the subscription price). We will pay all fees charged by the subscription agent. However, if you exercise your subscription rights through a custodian bank, broker, dealer or other nominee, you are responsible for paying any other commissions, fees, taxes or other expenses your nominee may charge you in connection with the exercise of the subscription rights.

Missing or Incomplete Subscription Information

If you fail to specify the number of units requested as an exercise of your basic subscription right or over-subscription privilege, or if you fail to include sufficient payment to purchase the number of units you requested, your payment will first be applied, to the fullest extent possible, to exercise your basic subscription rights. Any remaining payment amount will then be applied, to the fullest extent possible, to exercise your over-subscription privilege, to the extent over-subscription units are available for purchase.

After expiration of the rights offering, the subscription agent will promptly return, without interest or penalty, any excess subscription payments received.

In order for us to honor the exercise of your subscription rights, your rights certificate, any other required documents and payment must be received as set forth in this prospectus.

Issuance of Series B Convertible Preferred Stock and Warrants

The shares of Series B Convertible Preferred Stock and warrants that are purchased in the rights offering as part of the units will be issued in book-entry, or uncertificated, form meaning that you will receive a DRS account statement from our transfer agent reflecting ownership of these securities if you are a holder of record of shares or warrants. If you hold your shares of common stock or participating warrants in the name of a bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the securities you purchased in the rights offering.

Subscription Agent

The subscription agent for the rights offering is Broadridge Corporate Issuer Solutions, Inc. The address to which rights certificates and payments should be mailed or delivered by overnight courier is provided below. If sent by mail, we recommend that you send documents and payments by registered mail, properly insured, with return receipt requested, and that you allow a sufficient number of days to ensure delivery to the subscription agent and clearance or payment before the rights offering expires. Do not send or deliver these materials to us.

By Mail

Broadridge Corporate Issuer Solutions, Inc.
Attn: BCIS Re-Organization Dept.
P.O. Box 1317
Brentwood, New York 11717-0693
(855) 793-5068 (toll free)

By Hand or Overnight Courier

Broadridge Corporate Issuer Solutions, Inc.
Attn: BCIS IWS
51 Mercedes Way
Edgewood, New York 11717
(855) 793-5068 (toll free)

If you deliver the rights certificates in a manner different than as described herein, we may not honor your exercise of your subscription rights.

Please direct any questions or requests for assistance with exercise of your subscription rights to the subscription agent as follows:

Broadridge Corporate Issuer Solutions, Inc.

(855) 793-5068 (toll free)

Warrant Agent

The warrant agent for the warrants is VStock Transfer, LLC.

No Fractional Shares

We will not issue fractional shares of Series B Convertible Preferred Stock in the rights offering. Subscription holders of common stock and participating warrants will only be entitled to purchase a number of units representing a whole number of shares and warrants, rounded down to the nearest whole number that a holder would otherwise be entitled to purchase. Similarly, no fractional shares of common stock will be issued as a result of the conversion of shares of Series B Convertible Preferred Stock or the exercise of warrants. Instead, for any such fractional share that would otherwise have been issuable upon conversion of shares of Series B Convertible Preferred Stock, the Company may, at its election, pay a cash payment equal to such fraction multiplied by the conversion price or round up to the next whole share, and for any such fractional share that would have otherwise been issued upon exercise of warrants, the Company will round up such fraction to the next whole share.

Notice to Brokers and Nominees

If you are a broker, dealer, bank or other nominee holder that holds shares of our common stock for the account of others on the record date, you should notify the beneficial owners of the shares for whom you are the nominee of the rights offering as soon as possible to learn their intentions with respect to exercising their subscription rights. If a beneficial owner of our common stock so instructs, you should complete the rights certificate and submit it to the subscription agent with the proper subscription payment by the expiration date. You may exercise the number of subscription rights to which all beneficial owners in the aggregate otherwise would have been entitled had they been direct holders of our common stock on the record date, provided that you, as a nominee record holder, make a proper showing to the subscription agent by submitting the form entitled "Nominee Holder Certification," which is provided with your rights offering materials. If you did not receive this form, you should contact our subscription agent to request a copy.

Validity of Subscriptions

We will resolve all questions regarding the validity and form of the exercise of your subscription rights, including time of receipt and eligibility to participate in the rights offering. Our determination will be final and binding. Once made, subscriptions are irrevocable; we will not accept any alternative, conditional, or contingent subscriptions. We reserve the absolute right to reject any subscriptions not properly submitted or the acceptance of which would be unlawful. You must resolve any irregularities in connection with your subscriptions before the expiration date of the rights offering, unless we waive them in our sole discretion. Neither we nor the subscription agent is under any duty to notify you or your representative of defects in your subscriptions. A subscription will be considered accepted, subject to our right to withdraw or terminate the rights offering, only when the subscription agent receives a properly completed and duly executed rights certificate and any other required documents and the full subscription payment including final clearance of any personal check. Our interpretations of the terms and conditions of the rights offering will be final and binding.

Stockholder Rights

You will have no rights as a holder of the shares of our common stock issuable upon conversion of the Series B Convertible Preferred Stock issued in the rights offering until such Series B Convertible Preferred Stock is converted to common stock and such shares of common stock are issued in book-entry form or your account at your broker, dealer, bank or other nominee is credited with the shares of our common stock. Holders of warrants issued in connection with the rights offering will not have rights as holders of our common stock until such warrants are exercised and the shares of common stock underlying the warrants are issued to the holder.

Foreign Holders of Common Stock and Participating Warrants

We will not mail this prospectus or rights certificates to holders of common stock and participating warrants with addresses that are outside the United States or that have an army post office or foreign post office address. The subscription agent will hold these rights certificates for their account. To exercise subscription rights, our foreign holders of common stock and participating warrants must notify the subscription agent prior to 5:00 p.m., Eastern Time, on May 21, 2018, the third business day prior to the expiration date, of your exercise of subscription rights and provide evidence satisfactory to us, such as a legal opinion from local counsel, that the exercise of such subscription rights does not violate the laws of the jurisdiction in which such holder resides and payment by a U.S. bank in U.S. dollars before the expiration of the offer. If no notice is received by such time or the evidence presented is not satisfactory to us, the subscription rights represented thereby will expire.

No Revocation or Change

Once you submit the rights certificate or have instructed your nominee of your subscription request, you are not allowed to revoke or change the exercise or request a refund of monies paid. All exercises of subscription rights are irrevocable, even if you learn information about us that you consider to be unfavorable. You should not exercise your subscription rights unless you are certain that you wish to purchase shares at the subscription price.

U.S. Federal Income Tax Treatment of Rights Offering

For U.S. federal income tax purposes, we do not believe holders of shares of our common stock or participating warrants should recognize income or loss upon receipt or exercise of a subscription right. See “*Material U.S. Federal Income Tax Consequences.*”

No Recommendation to Rights Holders

Our board of directors is not making a recommendation regarding your exercise of the subscription rights. You are urged to make your decision to invest based on your own assessment of our business and financial condition, our prospects for the future, the terms of the rights offering, the information in this prospectus and other information relevant to your circumstances.

Fees and Expenses

We will pay all fees charged by the subscription agent, and by the dealer-manager. You are responsible for paying any other commissions, fees, taxes or other expenses incurred in connection with the exercise of your subscription rights.

Listing

The subscription rights may not be sold, transferred, assigned or given away to anyone, and will not be listed for trading on any stock exchange or market. There is no established public trading market for the Series B Convertible Preferred Stock and we do not currently intend to apply for listing of Series B Convertible Preferred Stock or the warrants on any securities exchange or recognized trading system. The shares of our common stock issuable upon conversion of the Series B Convertible Preferred Stock and underlying the warrants to be issued in the rights offering are traded on Nasdaq under the symbol "ATOS."

Distribution Arrangements

Maxim Group LLC is the dealer-manager for the rights offering. The dealer-manager will provide marketing assistance and advice to us in connection with the rights offering and will use its best efforts to solicit the exercise of subscription rights and participation in the over-subscription privilege. The dealer-manager is not underwriting or placing any of the subscription rights or the shares of our Series B Convertible Preferred Stock or warrants to be issued in the rights offering and does not make any recommendation with respect to such subscription rights (including with respect to the exercise or expiration of such subscription rights), shares or warrants. We have agreed to pay the dealer-manager certain fees and to reimburse the dealer-manager for certain out-of-pocket expenses incurred in connection with this offering. See "*Plan of Distribution*."

Other Matters

We are not making the rights offering in any state or other jurisdiction in which it is unlawful to do so, nor are we distributing or accepting any offers to purchase any units from subscription rights holders who are residents of those states or other jurisdictions or who are otherwise prohibited by federal or state laws or regulations from accepting or exercising the subscription rights. We may delay the commencement of the rights offering in those states or other jurisdictions, or change the terms of the rights offering, in whole or in part, in order to comply with the securities laws or other legal requirements of those states or other jurisdictions. Subject to state securities laws and regulations, we also have the discretion to delay allocation and distribution of any shares you may elect to purchase by exercise of your subscription privileges in order to comply with state securities laws. We may decline to make modifications to the terms of the rights offering requested by those states or other jurisdictions, in which case, if you are a resident in those states or jurisdictions or if you are otherwise prohibited by federal or state laws or regulations from accepting or exercising the subscription rights, you will not be eligible to participate in the rights offering. However, we are not currently aware of any states or jurisdictions that would preclude participation in the rights offering.

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES

The following discussion describes the material U.S. federal income tax consequences of the receipt and exercise (or expiration) of the subscription rights acquired through the rights offering, the ownership and disposition of shares of our Series B Convertible Preferred Stock and warrants received upon exercise of the subscription rights and the ownership and disposition of the shares of common stock received upon the conversion of our Series B Convertible Preferred Stock or the exercise of the warrants, and, insofar as it describes matters of federal income tax law or legal conclusions with respect thereto, constitutes the opinion of our tax counsel, Gibson, Dunn & Crutcher LLP. This discussion does not purport to be a complete analysis of all potential tax effects. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or non-U.S. tax laws are not discussed. This discussion is based on the U.S. Internal Revenue Code of 1986, as amended, or Code, Treasury Regulations promulgated thereunder, judicial decisions, and published rulings and administrative pronouncements of the U.S. Internal Revenue Service, or IRS, in each case in effect as of the date hereof. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a holder of the subscription rights, shares of our Series B Convertible Preferred Stock, warrants or shares of our common stock. We have not sought and will not seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a contrary position to that discussed below regarding the tax consequences of the receipt of subscription rights through the rights offering by persons holding shares of our common stock and warrants entitled to receive subscription rights pursuant to this rights offering (which we refer to as participating warrants), the exercise (or expiration) of the subscription rights, the acquisition, ownership and disposition of shares of our Series B Convertible Preferred Stock, the acquisition, ownership and disposition (or expiration) of warrants acquired upon exercise of the subscription rights, and the acquisition, ownership and disposition of shares of our common stock acquired upon conversion of our Series B Convertible Preferred Stock or exercise of the warrants.

This discussion is limited to the subscription rights acquired through the rights offering, shares of our Series B Convertible Preferred Stock and warrants acquired upon exercise of subscription rights and shares of our common stock acquired upon conversion of our Series B Convertible Preferred Stock or exercise of the warrants, in each case, that are held as a “capital asset” within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences relevant to a holder’s particular circumstances, including the impact of the alternative minimum tax or the unearned income Medicare contribution tax. In addition, it does not address consequences relevant to holders subject to particular rules, including, without limitation:

- U.S. expatriates and former citizens or long-term residents of the United States;
- persons holding our common stock, participating warrants, the

subscription
rights, shares of
our Series B
Convertible
Preferred Stock,
warrants or
shares of our
common stock
as part of a
hedge, straddle
or other risk
reduction
strategy or as
part of a
conversion
transaction or
other integrated
investment;
banks,
insurance
•companies, and
other financial
institutions;
brokers, dealers
or traders in
securities or
currencies or
•traders that elect
to
mark-to-market
their securities;
“controlled
foreign
corporations,”
“passive foreign
investment
companies,” and
•corporations
that accumulate
earnings to
avoid U.S.
federal income
tax;
•partnerships or
other entities or
arrangements
treated as
partnerships or
other
pass-through
entities for U.S.

federal income
tax purposes
(and investors
therein);
real estate
investment
trusts, regulated
investment
• companies,
grantor trusts,
tax-exempt
organizations or
governmental
organizations;
persons deemed
to sell the
subscription
rights, shares of
Series B
Convertible
• Preferred Stock,
or warrants or
shares of our
common stock
under the
constructive
sale provisions
of the Code;

persons for
whom our stock
constitutes
“qualified small
• business stock”
within the
meaning of
Section 1202 of
the Code;

- persons who received, hold or will receive shares of our common stock, participating warrants, the subscription rights, shares of our Series B Convertible Preferred Stock or warrants pursuant to the exercise of any employee stock option or otherwise as compensation and persons who hold restricted common stock;
- tax-qualified retirement plans; and
 - U.S. holders (as defined below) that have a functional currency other than the U.S. dollar.

If an entity treated as a partnership for U.S. federal income tax purposes holds shares of our common stock, participating warrants, the subscription rights, shares of our Series B Convertible Preferred Stock and warrants acquired upon exercise of subscription rights or shares of our common stock acquired upon conversion of our Series B Convertible Preferred Stock or exercise of the warrants, as the case may be, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership and certain determinations made at the partner level. Accordingly, partnerships and the partners in such partnerships should consult their tax advisors regarding the U.S. federal income tax consequences to them.

Tax Considerations Applicable to U.S. Holders

Definition of a U.S. Holder

For purposes of this discussion, a “U.S. holder” is any beneficial owner of shares of our common stock, participating warrants, our subscription rights, shares of our Series B Convertible Preferred Stock and warrants acquired upon exercise of subscription rights or shares of our common stock acquired upon conversion of our Series B Convertible Preferred Stock or exercise of warrants, as the case may be, that, for U.S. federal income tax purposes, is:

- an individual who is a citizen or resident of the United States;
- a corporation (or other entity treated as a corporation for U.S. federal income tax purposes) created or organized under the laws of the United States, any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (1) is subject to the primary supervision of a U.S. court and the control of one or more United States persons (within the meaning of Section 7701(a)(30) of the Code), or (2) has made a valid election under applicable Treasury Regulations to continue to be treated as a United States person.

Receipt of Subscription Rights

Although the authorities governing transactions such as this rights offering are complex and do not speak directly to the consequences of certain aspects of this rights offering, including the inclusion of the right to purchase warrants in the subscription rights (rather than the right to purchase only shares of our Series B Convertible Preferred Stock), the distribution of subscription rights to holders of participating warrants and the effects of the over-subscription privilege, a U.S. holder's receipt of subscription rights pursuant to the rights offering should not be treated as a taxable distribution with respect to its existing shares of common stock or participating warrants, as applicable, for U.S. federal income tax purposes. Section 305(a) of the Code generally provides that the receipt by a stockholder, or a holder of rights to acquire stock, of a right to acquire stock or warrants is not included in the taxable income of the stockholder; however, the general non-recognition rule in Section 305(a) of the Code is subject to exceptions described in Section 305(b) of the Code, which include "disproportionate distributions." A disproportionate distribution is generally a distribution or a series of distributions, including deemed distributions, that has the effect of the receipt of cash or other property by some stockholders (including holders of rights to acquire stock and holders of debt instruments convertible into stock) and an increase in the proportionate interest of other stockholders (including holders of rights to acquire stock and holders of debt instruments convertible into stock) in a corporation's assets or earnings and profits. During the last 36 months, the Company has not made any distributions of cash or property (other than stock or rights to acquire stock) with respect to: (i) its common stock or (ii) options or warrants to acquire its common stock. Currently the Company does not intend to make any future distributions of cash or property (other than stock or rights to acquire stock) with respect to: (i) its common stock or (ii) options or warrants to acquire its common stock; however, there is no guarantee that the Company will not make such distributions in the future. In addition, the Company does not currently have any convertible debt outstanding nor does the Company currently intend to issue any convertible debt.

The position regarding the tax-free treatment of the subscription right distribution is not binding on the IRS, or the courts. If this position is finally determined by the IRS or a court to be incorrect, whether because, contrary to our expectations, distributions of cash or property (other than stock or rights to acquire stock) are made with respect to our common stock, options or warrants, because the issuance of the subscription rights is a "disproportionate distribution" or otherwise, the fair market value of the subscription rights would be taxable to U.S. holders of common stock as a dividend to the extent of the U.S. holder's pro rata share of the company's current and accumulated earnings and profits, if any, with any excess being treated as a return of capital to the extent thereof and then as capital gain. Although no assurance can be given, the Company anticipates that it will not have current and accumulated earnings and profits through the end of 2018. Further, if the position regarding the tax-free treatment of the subscription rights distribution is incorrect, the treatment of holders of participating warrants is not clear, and it may differ from, and may be more adverse than, the treatment of the subscription rights distribution to the holders of common stock.

The following discussion is based upon the treatment of the subscription right issuance as a non-taxable distribution with respect to a U.S. holders' existing shares of common stock or participating warrants for U.S. federal income tax purposes.

Tax Basis in the Subscription Rights

If the fair market value of the subscription rights a U.S. holder receives is less than 15% of the fair market value of the U.S. holder's existing shares of common stock or participating warrants (in each case, with respect to which the subscription rights are distributed) on the date the U.S. holder receives the subscription rights, the subscription rights will be allocated a zero tax basis for U.S. federal income tax purposes, unless the U.S. holder elects to allocate the tax basis in the holder's existing shares of common stock or participating warrants between the existing shares of common stock or participating warrants and the subscription rights in proportion to the relative fair market values of the existing shares of common stock or participating warrants and the subscription rights determined on the date of receipt of the subscription rights. If a U.S. holder chooses to allocate tax basis between the holder's existing common shares or participating warrants and the subscription rights, the U.S. holder must make this election on a statement included with the holder's timely filed tax return (including extensions) for the taxable year in which the U.S. holder receives the subscription rights. Such an election is irrevocable. However, if the fair market value of the subscription rights a U.S. holder receives is 15% or more of the fair market value of the holder's existing shares of common stock or participating warrants on the date the U.S. holder receives the subscription rights, then the U.S. holder must allocate tax basis in the existing shares of common stock or participating warrants between those shares or warrants and the subscription rights the U.S. holder receives in proportion to their fair market values determined on the date the U.S. holder receives the subscription rights. Please refer to the discussion below regarding the U.S. tax treatment of a U.S. holder that, at the time of the receipt of the subscription right, no longer holds the common stock or participating warrants with respect to which the subscription right was distributed.

The fair market value of the subscription rights on the date that the subscription rights are distributed is uncertain, and we have not obtained, and do not intend to obtain, an appraisal of the fair market value of the subscription rights on that date. In determining the fair market value of the subscription rights, U.S. holders should consider all relevant facts and circumstances, including without limitation any difference between the subscription price of the subscription rights and the trading price of our shares of common stock on the date that the subscription rights are distributed, the fair market value and the conversion terms of the Series B Convertible Preferred Stock, the exercise price of the warrants, the length of the period during which the subscription rights may be exercised and the fact that the subscription rights are non-transferable.

Exercise of Subscription Rights

A U.S. holder will not recognize gain or loss upon the exercise of a subscription right in the rights offering. A U.S. holder's adjusted tax basis, if any, in the subscription right plus the subscription price should be allocated between the share of Series B Convertible Preferred Stock and the warrant acquired upon exercise of the subscription right. The basis in the stock or participating warrants upon which the subscription rights were issued which is allocated to the subscription rights under the prior section entitled "Tax Basis in the Subscription Rights" should be further allocated between the shares of Series B Convertible Preferred Stock and the warrant acquired upon exercise of the subscription right in proportion to their relative fair market values on the date the subscription rights were distributed. The subscription price should be allocated between the shares of Series B Convertible Preferred Stock and the warrant acquired upon exercise of the subscription right in proportion to their relative fair market values on the exercise date. These allocations will establish the U.S. holder's initial tax basis for U.S. federal income tax purposes in the shares of Series B Convertible Preferred Stock and warrants received upon exercise. The holding period of a share of Series B Convertible Preferred Stock or a warrant acquired upon exercise of a subscription right in the rights offering will begin on the date of exercise.

If, at the time of the receipt or exercise of the subscription right, the U.S. holder no longer holds the common stock or participating warrant with respect to which the subscription right was distributed, then certain aspects of the tax treatment of the receipt and exercise of the subscription right are unclear, including (1) the allocation of the tax basis between the shares of our common stock or participating warrants previously sold and the subscription right, (2) the impact of such allocation on the amount and timing of gain or loss recognized with respect to the shares of our common stock or participating warrants previously sold, and (3) the impact of such allocation on the tax basis of the shares of our Series B Convertible Preferred Stock and warrants acquired upon exercise of the subscription right. If a U.S. holder exercises a subscription right received in the rights offering after disposing of shares of our common stock or participating warrants with respect to which the subscription right is received, the U.S. holder should consult its tax advisor.

Expiration of Subscription Rights

If a U.S. holder allows subscription rights received in the rights offering to expire, the U.S. holder should not recognize any gain or loss for U.S. federal income tax purposes, and the U.S. holder should re-allocate any portion of the tax basis in its existing common shares or participating warrants previously allocated to the subscription rights that have expired to the existing common shares.

Sale or Other Disposition, Exercise or Expiration of Warrants

Upon the sale or other taxable disposition of a warrant (other than by exercise) received upon exercise of a subscription right, a U.S. holder will generally recognize capital gain or loss equal to the difference between the amount realized on the sale or other taxable disposition and the U.S. holder's tax basis in the warrant. This capital gain or loss will be long-term capital gain or loss if the U.S. holder's holding period in such warrant is more than one year at the time of the sale or other taxable disposition. The deductibility of capital losses is subject to certain limitations.

A U.S. holder will not be required to recognize income, gain or loss upon exercise of a warrant received upon a cash exercise of a subscription right (except to the extent the U.S. holder receives a cash payment for any fractional share that would otherwise have been issuable upon exercise of the warrant). A U.S. holder's tax basis in a share of our common stock received upon exercise of the warrants for cash will be equal to the sum of (1) the U.S. holder's tax basis in the warrants exchanged therefor and (2) the exercise price of such warrants, decreased by the adjusted tax basis allocable to any fractional share that would otherwise have been issuance upon exercise of the warrant. A U.S. holder's holding period in the shares of our common stock received upon exercise will commence on the day after such U.S. holder exercises the warrants.

In certain circumstances, the warrants will be exercisable on a cashless basis. The U.S. federal income tax treatment of an exercise of a warrant on a cashless basis is not clear, and could differ from the consequences described above. It is possible that a cashless exercise could be a taxable event. U.S. holders are urged to consult their tax advisors as to the consequences of an exercise of a warrant on a cashless basis, including with respect to whether the exercise is a taxable event, and their holding period and tax basis in the common stock received.

If a warrant expires without being exercised, a U.S. holder will recognize a capital loss in an amount equal to such holder's adjusted tax basis in the warrant. Such loss will be long-term capital loss if, at the time of the expiration, the U.S. holder's holding period in such warrant is more than one year. The deductibility of capital losses is subject to certain limitations.

Constructive Dividends on Warrants

As described in the section entitled "*Dividend Policy*," we do not anticipate declaring or paying dividends to holders of our common stock or our Series B Convertible Preferred Stock in the foreseeable future. However, if at any time during the period in which a U.S. holder holds warrants received upon exercise of a subscription right, we were to pay a taxable dividend to our stockholders and, in accordance with the anti-dilution provisions of the warrants, the exercise price of the warrants were decreased, that decrease would be deemed to be the payment of a taxable dividend to a U.S. holder of the warrants to the extent of our earnings and profits, notwithstanding the fact that such holder will not receive a cash payment. If the exercise price is adjusted in certain other circumstances (or in certain circumstances, there is a failure to make adjustments), or there is an adjustment to the number of common shares that will be issued on exercise of the warrants, such adjustments may also result in the deemed payment of a taxable dividend to a U.S. holder. U.S. holders should consult their tax advisors regarding the proper treatment of any adjustments to the exercise price of the warrants.

Distributions on Series B Convertible Preferred Stock and Common Stock

As described in the section entitled “*Dividend Policy*,” we do not anticipate declaring or paying dividends to holders of our Series B Convertible Preferred Stock or common stock in the foreseeable future. However, if we do make distributions of cash or property on our Series B Convertible Preferred Stock or common stock, such distributions will constitute dividends to the extent paid out of our current or accumulated earnings and profits, as determined for U.S. federal income tax purposes. Dividends received by a corporate U.S. holder may be eligible for a dividends received deduction, subject to applicable limitations. Dividends received by certain non-corporate U.S. holders, including individuals, are generally taxed at the lower applicable capital gains rate provided certain holding period and other requirements are satisfied. Distributions in excess of our current and accumulated earnings and profits will constitute a return of capital and first be applied against and reduce a U.S. holder’s adjusted tax basis in its Series B Convertible Preferred Stock or common stock, as the case may be, but not below zero. Any excess will be treated as capital gain and will be treated as described below in the section relating to the sale or disposition of our common stock.

Sale, Exchange or Other Disposition of Series B Convertible Preferred Stock and Common Stock

Upon a sale, exchange, or other taxable disposition of our Series B Convertible Preferred Stock (other than by conversion) or our common stock, a U.S. holder generally will recognize capital gain or loss equal to the difference between the amount realized (not including any amount attributable to declared and unpaid dividends, which will be taxable as described above to U.S. holders of record who have not previously included such dividends in income) and the U.S. holder's adjusted tax basis in our Series B Convertible Preferred Stock or our common stock. The U.S. holder's adjusted tax basis in our Series B Convertible Preferred Stock generally will equal its initial tax basis (discussed above under "*—Exercise of Subscription Rights*"), reduced by the amount of any cash distributions treated as a return of capital as described above. A U.S. holder's adjusted tax basis in our common stock generally will equal its initial tax basis in our common stock (discussed below under "*—Conversion of the Series B Convertible Preferred Stock into Our Common Stock*"), reduced by the amount of any cash distributions treated as a return of capital as described above. Such capital gain or loss generally will be long-term capital gain or loss if the U.S. holder's holding period for our Series B Convertible Preferred Stock or our common stock exceeded one year at the time of disposition (see the discussion below under "*—Conversion of Our Series B Convertible Preferred Stock into Our Common Stock*" regarding a U.S. holder's holding period for our common stock). Long-term capital gains recognized by certain non-corporate U.S. Holders, including individuals, generally are subject to reduced rates of taxation. The deductibility of capital losses is subject to limitations.

Conversion of Our Series B Convertible Preferred Stock into Our Common Stock

A U.S. holder will not recognize any gain or loss in respect of the receipt of our common stock upon the conversion of our Series B Convertible Preferred Stock (except to the extent the U.S. holder receives a cash payment for any fractional share that would otherwise have been issuable upon conversion of the Series B Convertible Preferred Stock). The adjusted tax basis of our common stock that a U.S. holder receives on conversion will equal the adjusted tax basis of the Series B Convertible Preferred Stock converted (decreased by the adjusted tax basis allocable to any fractional share that would otherwise have been issuance upon conversion of the Series B Convertible Preferred Stock), and the holding period of such common stock received on conversion will include the period during which the U.S. holder held the Series B Convertible Preferred Stock prior to conversion.

In the event a U.S. holder's Series B Convertible Preferred Stock is converted pursuant to an election by such U.S. holder in the case of certain acquisitions or fundamental changes or pursuant to certain other transactions (including our consolidation or merger into another person), the tax treatment of such a conversion will depend upon the facts underlying the particular transaction triggering such a conversion. In this regard, it is possible that any related adjustments of the conversion rate would be treated as a constructive distribution to the U.S. holder as described below under "*—Tax Consequences Applicable to U.S. Holders—Constructive Dividends on Series B Convertible Preferred Stock.*" U.S. holders should consult their own tax advisors to determine the specific tax treatment of a conversion under such circumstances.

Constructive Dividends on Series B Convertible Preferred Stock

The conversion rate of our Series B Convertible Preferred Stock is subject to adjustment under certain circumstances, as described above under “*Description of Securities—Preferred Stock—Series B Convertible Preferred Stock.*” Section 305(c) of the Code and Treasury regulations thereunder may treat a U.S. holder of our Series B Convertible Preferred Stock as having received a constructive distribution includable in such U.S. holder’s income in the manner as described above under “*—Tax Consequences Applicable to U.S. Holders—Distributions on Series B Convertible Preferred Stock and Common Stock,*” if and to the extent that certain adjustments in the conversion rate (or failures to make such an adjustment) increase the proportionate interest of such U.S. holder in our earnings and profits. In certain other circumstances, an adjustment to the conversion rate of our Series B Convertible Preferred Stock or a failure to make such an adjustment could potentially give rise to constructive distributions to U.S. holders of our common stock. Thus, under certain circumstances, U.S. holders may recognize income in the event of a constructive distribution even though they may not receive any cash or property.

Information Reporting and Backup Withholding

A U.S. holder will be subject to information reporting and may be subject to backup withholding when such holder receives dividend payments (including constructive dividends) or receives proceeds from the sale or other taxable disposition of the warrants, shares of our Series B Convertible Preferred Stock acquired through the exercise of subscription rights or shares of our common stock acquired through conversion of our Series B Convertible Preferred Stock or exercise of the warrants. Certain U.S. holders are exempt from backup withholding, including certain corporations and certain tax-exempt organizations. A U.S. holder will be subject to backup withholding if such holder is not otherwise exempt (or fails to properly establish an exemption) and such holder:

- fails to
furnish the
holder's
taxpayer
identification
number,
which for an
individual is
ordinarily his
or her social
security
number;
furnishes an
incorrect
- taxpayer
identification
number;
is notified by
the IRS that
the holder
previously
failed to
- properly
report
payments of
interest or
dividends; or
- fails to certify
under
penalties of
perjury that
the holder has
furnished a
correct
taxpayer
identification
number and

that the IRS
has not
notified the
holder that
the holder is
subject to
backup
withholding.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a U.S. holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS. U.S. holders should consult their tax advisors regarding their qualification for an exemption from backup withholding and the procedures for obtaining such an exemption.

Tax Considerations Applicable to Non-U.S. Holders

For purposes of this discussion, a "non-U.S. holder" is a beneficial owner of shares of our common stock, participating warrants, our subscription rights, shares of our Series B Convertible Preferred Stock and warrants acquired upon exercise of subscription rights or shares of our common stock acquired upon conversion of our Series B Convertible Preferred Stock or exercise of warrants, as the case may be, that is neither a U.S. holder nor an entity treated as a partnership for U.S. federal income tax purposes.

Receipt, Exercise and Expiration of the Subscription Rights

The discussion assumes that the receipt of subscription rights will be treated as a nontaxable distribution. See "*Tax Consequences Applicable to U.S. Holders—Receipt of Subscription Rights*" above. In such case, non-U.S. holders will not be subject to U.S. federal income tax (or any withholding thereof) on the receipt, exercise or expiration of the subscription rights.

Exercise of Warrants

A non-U.S. holder will not be subject to U.S. federal income tax on the cash exercise of warrants into shares of our common stock (except to the extent the U.S. holder receives a cash payment for any fractional share that would otherwise have been issuable upon exercise of the warrant, which will be treated as a sale subject the rules described under "*Tax Considerations Applicable to Non-U.S. Holders—Sale or Other Disposition of Series B Convertible Preferred Stock, Common Stock or Warrants*"). As discussed above in "*Tax Considerations Applicable to U.S. Holders—Sale or Other Disposition, Exercise or Expiration of Warrants*," the U.S. federal income tax treatment of an exercise of a warrant on a cashless basis is not clear. Non-U.S. holders are urged to consult their tax advisors as to the consequences of an exercise of a warrant on a cashless basis, including with respect to whether the exercise is a

taxable event, and their holding period and tax basis in the common stock received.

Constructive Dividends on Warrants

As described in the section entitled “*Dividend Policy*,” we do not anticipate declaring or paying dividends to holders of our Series B Convertible Preferred Stock or common stock in the foreseeable future. However, if at any time during the period in which a non-U.S. holder holds warrants received on the exercise of subscription rights, we were to pay a taxable dividend to our stockholders and, in accordance with the anti-dilution provisions of the warrants, the exercise price of the warrants were decreased, that decrease would be deemed to be the payment of a taxable dividend to a non-U.S. holder to the extent of our earnings and profits, notwithstanding the fact that such holder will not receive a cash payment. If the exercise price is adjusted in certain other circumstances (or in certain circumstances, there is a failure to make adjustments), or there is an adjustment to the number of common shares that will be issued on exercise of the warrants, such adjustments may also result in the deemed payment of a taxable dividend to a non-U.S. holder. Any resulting withholding tax attributable to deemed dividends may be collected from other amounts payable or distributable to the non-U.S. holder. Non-U.S. holders should consult their tax advisors regarding the proper treatment of any adjustments to the warrants.

Distributions on Series B Convertible Preferred Stock and Common Stock

As described in the section entitled “*Dividend Policy*,” we do not anticipate declaring or paying dividends to holders of our Series B Convertible Preferred Stock or common stock in the foreseeable future. However, if we do make distributions of cash or property on our Series B Convertible Preferred Stock or common stock, such distributions will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Amounts not treated as dividends for U.S. federal income tax purposes will constitute a return of capital and first be applied against and reduce a non-U.S. holder’s adjusted tax basis in its Series B Convertible Preferred Stock or common stock, as the case may be, but not below zero. Any excess will be treated as capital gain and will be treated as described below in the section relating to the sale or disposition of our Series B Convertible Preferred Stock, our common stock or warrants. Because we may not know the extent to which a distribution is a dividend for U.S. federal income tax purposes at the time it is made, for purposes of the withholding rules discussed below we or the applicable withholding agent may treat the entire distribution as a dividend.

Subject to the discussion below on backup withholding and foreign accounts, dividends paid to a non- U.S. holder of our Series B Convertible Preferred Stock or common stock that are not effectively connected with the non-U.S. holder’s conduct of a trade or business within the United States will be subject to U.S. federal withholding tax at a rate of 30% of the gross amount of the dividends (or such lower rate specified by an applicable income tax treaty).

Non-U.S. holders will be entitled to a reduction in or an exemption from withholding on dividends as a result of either (a) an applicable income tax treaty or (b) the non-U.S. holder holding our Series B Convertible Preferred Stock or common stock in connection with the conduct of a trade or business within the United States and dividends being effectively connected with that trade or business. To claim such a reduction in or exemption from withholding, the

non-U.S. holder must provide the applicable withholding agent with a properly executed (a) IRS Form W-8BEN or W-8BEN-E (or other applicable documentation) claiming an exemption from or reduction of the withholding tax under the benefit of an income tax treaty between the United States and the country in which the non-U.S. holder resides or is established, or (b) IRS Form W-8ECI stating that the dividends are not subject to withholding tax because they are effectively connected with the conduct by the non-U.S. holder of a trade or business within the United States, as may be applicable. These certifications must be provided to the applicable withholding agent prior to the payment of dividends and must be updated periodically. Non-U.S. holders that do not timely provide the applicable withholding agent with the required certification, but that qualify for a reduced rate under an applicable income tax treaty, may obtain a refund of any excess amounts withheld by timely filing an appropriate claim for refund with the IRS.

If dividends paid to a non-U.S. holder are effectively connected with the non-U.S. holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the non-U.S. holder maintains a permanent establishment in the United States to which such dividends are attributable), then, although exempt from U.S. federal withholding tax (provided the non-U.S. holder provides appropriate certification, as described above, and subject to the discussion below on backup withholding and foreign accounts), the non-U.S. holder will be subject to U.S. federal income tax on such dividends on a net income basis at the regular graduated U.S. federal income tax rates. In addition, a non-U.S. holder that is a corporation may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on its effectively connected earnings and profits for the taxable year that are attributable to such dividends, as adjusted for certain items. Non-U.S. holders should consult their tax advisors regarding their entitlement to benefits under any applicable income tax treaty.

Sale or Other Disposition of Series B Convertible Preferred Stock, Common Stock or Warrants

Subject to the discussions below on backup withholding and foreign accounts, a non-U.S. holder will not be subject to U.S. federal income tax on any gain realized upon the sale or other taxable disposition of our Series B Convertible Preferred Stock, warrants or our common stock unless:

- the gain is effectively connected with the non-U.S. holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the non-U.S. holder maintains a permanent establishment in the United States to which such gain is attributable);
 - the non-U.S. holder is a nonresident alien individual present in the United States for 183 days or more during the taxable year of the disposition and certain other requirements are met; or
- our Series B Convertible Preferred Stock, warrants or our common stock constitutes a U.S. real property interest, or USRPI, by reason of our status as a U.S. real property holding corporation, or USRPHC, for U.S. federal income tax purposes.

Gain described in the first bullet point above generally will be subject to U.S. federal income tax on a net income basis at the regular graduated rates. A Non-U.S. holder that is a corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected gain, as adjusted for certain items.

Gain described in the second bullet point above will be subject to U.S. federal income tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on any gain derived from the disposition, which may be offset by U.S. source capital losses of the non-U.S. holder (even though the individual is not considered a resident of the United States), provided the non-U.S. holder has timely filed U.S. federal income tax returns with respect to such losses.

With respect to the third bullet point above, we believe we are not currently and do not anticipate becoming a USRPHC. Because the determination of whether we are a USRPHC depends on the fair market value of our USRPIs relative to the fair market value of our other business assets and our non- U.S. real property interests, however, there can be no assurance we are not a USRPHC or will not become one in the future.

Non-U.S. holders should consult their tax advisors regarding potentially applicable income tax treaties that may provide for different rules.

Conversion of Our Series B Convertible Preferred Stock into Our Common Stock

A non-U.S. holder will not recognize any gain or loss in respect of the receipt of our common stock upon the conversion of our Series B Convertible Preferred Stock (except to the extent the non-U.S. holder receives a cash payment for any fractional share that would otherwise have been issuable upon conversion of the Series B Convertible Preferred Stock).

Constructive Dividends on Series B Convertible Preferred Stock

As described above under “—*Tax Consequences Applicable to U.S. Holders—Constructive Dividends on Series B Convertible Preferred Stock*,” in certain circumstances, a non-U.S. holder will be deemed to receive a constructive distribution from us. Adjustments in the conversion rate (or failures to adjust the conversion rate) that increase the proportionate interest of a non-U.S. holder in our earnings and profits could result in deemed distributions to the non-U.S. holder that are treated as dividends for U.S. federal income tax purposes. Any constructive dividend deemed paid to a non-U.S. holder will be subject to U.S. federal income tax or withholding tax in the manner described above under “—*Tax Consequences Applicable to Non-U.S. Holders—Distributions on Series B Convertible Preferred Stock and Common Stock*.” It is possible that U.S. federal tax on the constructive dividend would be withheld, if applicable, from subsequent payments on the Series B Convertible Preferred Stock or our common stock.

Information Reporting and Backup Withholding

A non-U.S. holder will not be subject to backup withholding with respect to distributions on our Series B Convertible Preferred Stock, warrants or common stock we make to the non-U.S. holder, provided the applicable withholding agent does not have actual knowledge or reason to know such holder is a United States person and the holder timely certifies its non-U.S. status, such as by providing a valid IRS Form W-8BEN, W-8BEN-E or W-8ECI, or other applicable certification. However, information returns generally will be filed with the IRS in connection with any distributions (including deemed distributions) made on our Series B Convertible Preferred Stock, warrants and our common stock to the non-U.S. holder, regardless of whether any tax was actually withheld. Copies of these information returns may also be made available under the provisions of a specific treaty or agreement to the tax authorities of the country in which the non-U.S. holder resides or is established.

Information reporting and backup withholding may apply to the proceeds of a sale or other taxable disposition of our Series B Convertible Preferred Stock, warrants or our common stock within the United States, and information reporting may (although backup withholding generally will not) apply to the proceeds of a sale or other taxable disposition of our Series B Convertible Preferred Stock, warrants or our common stock outside the United States conducted through certain U.S.-related financial intermediaries, in each case, unless the beneficial owner timely certifies under penalty of perjury that it is a non-U.S. holder on IRS Form W-8BEN or W-8BEN-E, or other

applicable form (and the payor does not have actual knowledge or reason to know that the beneficial owner is a U.S. person) or such owner otherwise timely establishes an exemption. Proceeds of a disposition of our Series B Convertible Preferred Stock, warrants or our common stock conducted through a non-U.S. office of a non-U.S. broker generally will not be subject to backup withholding or information reporting.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a non-U.S. holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

Additional Withholding Tax on Payments Made to Foreign Accounts

Withholding taxes may be imposed under the Foreign Account Tax Compliance Act, or FATCA, on certain types of payments made to non-U.S. financial institutions and certain other non-U.S. entities. Specifically, a 30% withholding tax may be imposed on dividends (including deemed dividends) paid on our Series B Convertible Preferred Stock, common stock or warrants, or gross proceeds from the sale or other disposition of our Series B Convertible Preferred Stock, warrants or our common stock paid to a “foreign financial institution” or a “non-financial foreign entity” (each as defined in the Code), unless (1) the foreign financial institution undertakes certain diligence and reporting obligations, (2) the non-financial foreign entity either certifies it does not have any “substantial United States owners” (as defined in the Code) or furnishes identifying information regarding each substantial United States owner, or (3) the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from these rules. If the payee is a foreign financial institution and is subject to the diligence and reporting requirements in (1) above, it must enter into an agreement with the U.S. Department of the Treasury requiring, among other things, that it undertake to identify accounts held by certain “specified United States persons” or “United States-owned foreign entities” (each as defined in the Code), annually report certain information about such accounts, and withhold 30% on certain payments to non-compliant foreign financial institutions and certain other account holders. Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the United States governing FATCA may be subject to different rules.

Under the applicable Treasury Regulations and administrative guidance, withholding under FATCA generally applies to payments of dividends (including deemed dividends), and will apply to payments of gross proceeds from the sale or other disposition of our Series B Convertible Preferred Stock, warrants or our common stock on or after January 1, 2019. Because we may not know the extent to which a distribution is a dividend for U.S. federal income tax purposes at the time it is made, for purposes of these withholding rules we or the applicable withholding agent may treat the entire distribution as a dividend. Prospective investors should consult their tax advisors regarding the potential application of these withholding provisions.

DESCRIPTION OF SECURITIES

Preferred Stock

We may issue shares of our preferred stock from time to time, in one or more series. Under our certificate of incorporation, our board of directors has the authority, without further action by stockholders, to designate up to 10,000,000 shares of preferred stock in one or more series and to fix the rights, preferences, privileges, qualifications and restrictions granted to or imposed upon the preferred stock, including dividend rights, conversion rights, voting rights, rights and terms of redemption, liquidation preference and sinking fund terms, any or all of which may be greater than the rights of the common stock.

If we issue preferred stock, we will fix the rights, preferences, privileges, qualifications and restrictions of the preferred stock of each series that we sell under this prospectus and applicable prospectus supplements in the certificate of designations relating to that series. If we issue preferred stock, we will incorporate by reference into the registration statement of which this prospectus is a part the form of any certificate of designations that describes the terms of the series of preferred stock we are offering before the issuance of the related series of preferred stock. We urge you to read the prospectus supplement related to any series of preferred stock we may offer, as well as the complete certificate of designations that contains the terms of the applicable series of preferred stock.

Series A Junior Participating Preferred Stock. In connection with our May 19, 2014 Shareholder Rights Plan, discussed below, the Company has designated 750,000 shares of Series-A Junior Participating Preferred Stock, par value \$0.001 per share through the filing of a certificate of designation with the Delaware Secretary of State. The shareholder rights agreement 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 our 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 our common stock (or, in the case of a person who beneficially owned 15% or more of our common stock on the date the stockholder rights agreement was executed, by acquiring beneficial ownership of additional shares representing 2.0% of our 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 our 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 our 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.

Series A Convertible Preferred Stock. In connection with our April 2017 financing, we designated 4,000 shares of the 10,000,000 authorized shares of preferred stock as Series A Convertible Preferred Stock. As of the date of this prospectus, no shares of Series A Convertible Preferred Stock are outstanding.

Series B Convertible Preferred Stock. We will authorize the Series B Convertible Preferred Stock by filing a certificate of designation with the Secretary of State of Delaware. The certificate of designation may be authorized by our Board without approval by our stockholders.

Conversion. Each share of Series B Convertible Preferred Stock will be convertible at our option at any time on or after the first anniversary of the closing of the rights offering or at the option of the holder at any time, into the number of shares of our common stock determined by dividing the \$1,000 stated value per share of the Series B Convertible Preferred Stock by a conversion price of \$3.52 per share. In addition, the conversion price per share is subject to adjustment for stock dividends, distributions, subdivisions, combinations or reclassifications. Subject to limited exceptions, a holder of the Series B Convertible Preferred Stock will not have the right to convert any portion of the Series B Convertible Preferred Stock to the extent that, after giving effect to the conversion, the holder, together with its affiliates, would beneficially own in excess of 9.99% of the number of shares of our common stock outstanding immediately after giving effect to its conversion.

Fundamental Transactions. In the event we effect certain mergers, consolidations, sales of substantially all of our assets, tender or exchange offers, reclassifications or share exchanges in which our common stock is effectively converted into or exchanged for other securities, cash or property, we consummate a business combination in which another person acquires 50% of the outstanding shares of our common stock, or any person or group becomes the beneficial owner of 50% of the aggregate ordinary voting power represented by our issued and outstanding common stock, then, upon any subsequent conversion of the Series B Convertible Preferred Stock, the holders of the Series B Convertible Preferred Stock will have the right to receive any shares of the acquiring corporation or other consideration it would have been entitled to receive if it had been a holder of the number of shares of common stock then issuable upon conversion in full of the Series B Convertible Preferred Stock.

Dividends. Holders of Series B Convertible Preferred Stock shall be entitled to receive dividends (on an as-if-converted-to-common-stock basis) in the same form as dividends actually paid on shares of the common stock when, as and if such dividends are paid on shares of common stock.

Voting Rights. Except as otherwise provided in the certificate of designation or as otherwise required by law, the Series B Convertible Preferred Stock has no voting rights.

Liquidation Preference. Upon our liquidation, dissolution or winding-up, whether voluntary or involuntary, holders of Series B Convertible Preferred Stock will be entitled to receive out of our assets, whether capital or surplus, the same amount that a holder of Common Stock would receive if the Series B Convertible Preferred Stock were fully converted (disregarding for such purpose any conversion limitations under the certificate of designation) to Common Stock, which amounts shall be paid *pari passu* with all holders of Common Stock.

Redemption Rights. We are not obligated to redeem or repurchase any shares of Series B Convertible Preferred Stock. Shares of Series B Convertible Preferred Stock are not otherwise entitled to any redemption rights, or mandatory sinking fund or analogous provisions.

Warrants

Warrants Included in Units Issuable in the Rights Offering

The warrants to be issued as a part of this rights offering will be separately transferable following their issuance and through their expiration four years from the date of issuance. Each warrant will entitle the holder to purchase one share of common stock at an exercise price of \$4.05 per share from the date of issuance through its expiration. We do not intend to have the warrants listed for trading on any securities exchange or recognized trading system. The

common stock underlying the warrants, upon issuance, will also be traded on Nasdaq under the symbol “ATOS.”

Unless a physical certificate is requested, all warrants that are purchased in the rights offering as part of the units will be issued in book-entry, or uncertificated, form meaning that you will receive a DRS account statement from our transfer agent reflecting ownership of warrants if you are a holder of record of shares or warrants. The subscription agent will arrange for the issuance of the warrants as soon as practicable after the closing, which will occur as soon as practicable after the rights offering has expired but which may occur up to five business days thereafter. At closing, all prorating calculations and reductions contemplated by the terms of the rights offering will have been effected and payment to us for the subscribed-for units will have cleared. If you hold your shares of common stock or participating warrants in the name of a bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the warrants you purchased in the rights offering.

Exercisability. Each warrant will be exercisable at any time and will expire four years from the date of issuance. The warrants will be exercisable, at the option of each holder, in whole or in part by delivering to us a duly executed exercise notice and payment in full for the number of shares of our common stock purchased upon such exercise, except in the case of a cashless exercise as discussed below.

The number of shares of common stock issuable upon exercise of the warrants is subject to adjustment in certain circumstances, including a stock split of, stock dividend on, or a subdivision, combination or recapitalization of the common stock. Upon the merger, consolidation, sale of substantially all of our assets, or other similar transaction, the holders of warrants shall, at the option of the company, be required to exercise the warrants immediately prior to the closing of the transaction, or such warrants shall automatically expire. Upon such exercise, the holders of warrants shall participate on the same basis as the holders of common stock in connection with the transaction.

Cashless Exercise. If at any time there is no effective registration statement registering, or the prospectus contained therein is not available for issuance of, the shares issuable upon exercise of the warrant, the holder may exercise the warrant on a cashless basis. When exercised on a cashless basis, a portion of the warrant is cancelled in payment of the purchase price payable in respect of the number of shares of our common stock purchasable upon such exercise.

Exercise Price. Each warrant represents the right to purchase one share of common stock at an exercise price of \$4.05 per share. In addition, the exercise price per share is subject to adjustment for stock dividends, distributions, subdivisions, combinations, or reclassifications, and for certain dilutive issuances. Subject to limited exceptions, a holder of warrants will not have the right to exercise any portion of the warrant to the extent that, after giving effect to the exercise, the holder, together with its affiliates, and any other person acting as a group together with the holder or any of its affiliates, would beneficially own in excess of 4.99% of the number of shares of our common stock outstanding immediately after giving effect to its exercise. The holder, upon notice to the Company, may increase or decrease the beneficial ownership limitation provisions of the warrant, provided that in no event shall the limitation exceed 9.99% of the number of shares of our common stock outstanding immediately after giving effect to the exercise of the warrant.

Transferability. Subject to applicable laws and restrictions, a holder may transfer a warrant upon surrender of the warrant to us with a completed and signed assignment in the form attached to the warrant. The transferring holder will be responsible for any tax that liability that may arise as a result of the transfer.

Exchange Listing. We do not intend to apply to list the warrants on any securities exchange or recognized trading system.

Rights as Stockholder. Except as set forth in the warrant, the holder of a warrant, solely in such holder's capacity as a holder of a warrant, will not be entitled to vote, to receive dividends, or to any of the other rights of our stockholders.

Redemption Rights. We may redeem the warrants for \$0.18 per warrant if the VWAP of our common stock equals or exceeds \$10.56 per share for ten consecutive trading days, provided that we may not do so prior to the first anniversary of closing of the rights offering.

Amendments and Waivers. The provisions of each warrant may be modified or amended or the provisions thereof waived with the written consent of us and the holder.

The warrants will be issued pursuant to a warrant agent agreement by and between us and VStock Transfer, LLC, the warrant agent.

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. We have never paid any cash dividends on our common stock and our Board 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 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, 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 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 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, 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.

Undesignated Preferred Stock. Our certificate of incorporation authorizes “blank-check” preferred stock, which means that our Board 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 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.

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.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is VStock Transfer, LLC, 18 Lafayette Place, Woodmere, New York 11598 (Telephone: (212) 828-8436; Facsimile (646) 536-3179).

Quotation

Our common stock is currently quoted on the NASDAQ Capital Market under the symbol “ATOS”. We do not intend to apply to list the warrants for trading on any securities exchange or recognized trading system.

PLAN OF DISTRIBUTION

We will distribute rights certificates and copies of this prospectus to those persons who were holders of our common stock or our December 22, 2017 warrants on May 9, 2018, the record date for the rights offering, promptly following the effective date of the registration statement of which this prospectus forms a part. We are offering the rights and the units underlying the rights directly to you. Those directors and officers of the Company who may assist in the rights offering will not register with the SEC as brokers in reliance on certain safe harbor provisions contained in Rule 3a4-1 under the Exchange Act. Broadridge Corporate Issuer Solutions, Inc. is acting as our subscription agent to effect the exercise of the rights and the issuance of the underlying units. Therefore, while certain of our directors, officers or employees may solicit responses from you, they will not receive any commissions or compensation for those services.

Delivery of Series B Convertible Preferred Stock and Warrants

If your shares or participating warrants are held in the name of a broker, dealer, custodian bank or other nominee, then you should send your subscription documents and subscription payment to that record holder. If you are the record holder, then you should send your subscription documents, rights certificate, and subscription payment to the address provided below. If sent by mail, we recommend that you send documents and payments by registered mail, properly insured, with return receipt requested, and that a sufficient number of days be allowed to ensure delivery to the subscription agent. Do not send or deliver these materials to the Company.

By Mail

Broadridge Corporate Issuer Solutions, Inc.
Attn: BCIS Re-Organization Dept.
P.O. Box 1317
Brentwood, New York 11717-0693
(855) 793-5068 (toll free)

By Hand or Overnight Courier

Broadridge Corporate Issuer Solutions, Inc.
Attn: BCIS IWS
51 Mercedes Way
Edgewood, New York 11717
(855) 793-5068 (toll free)

See “*The Rights Offering—Method of Exercising Subscription Rights.*” If you have any questions regarding the Company or the rights offering, or you have any questions regarding completing a rights certificate or submitting payment in the rights offering, please contact the subscription agent, Broadridge Corporate Issuer Solutions, Inc., toll free at (855) 793-5068, or by mail at Broadridge Corporate Issuer Solutions, Inc., Attn: BCIS Re-Organization Dept., P.O. Box 1317, Brentwood, New York, 11717-0693.

Other than as described in this prospectus, we do not know of any existing agreements between any stockholder, broker, dealer, underwriter or agent relating to the sale or distribution of the underlying securities.

Maxim Group LLC is the dealer-manager of this rights offering. In such capacity, such dealer-manager will provide marketing assistance and financial advice (including determining the subscription price and the structure of the rights offering) to us in connection with this offering and will solicit the exercise of basic subscription rights and participation in the over-subscription privilege. The dealer-manager will provide us with updated investor feedback and recommendations on pricing and structure through to the end of the subscription period. The dealer-manager is not underwriting or placing any of the basic subscription rights and does not make any recommendation with respect to such basic subscription rights (including with respect to the exercise or expiration of such basic subscription rights).

In connection with this rights offering, we have agreed to pay fees to Maxim Group LLC as dealer-manager a cash fee equal to 7.0% of the gross proceeds received by us directly from exercises of the subscription rights. We advanced \$15,000 to Maxim Group LLC against reimbursement of accountable expenses upon their engagement as a dealer-manager, or the Advance, and agreed to reimburse the reasonable fees and expenses (including up to \$75,000 of legal fees) of the dealer-manager up to \$85,000. Any portion of the advance will be returned to us to the extent it is not actually incurred.

We have also agreed to indemnify the dealer-manager and its respective affiliates against certain liabilities arising under the Securities Act. The dealer-manager's participation in this offering is subject to customary conditions contained in the dealer-manager agreement, including the receipt by the dealer-manager of an opinion of our counsel. The dealer-manager and its affiliates may provide to us from time to time in the future in the ordinary course of their business certain financial advisory, investment banking and other services for which they will be entitled to receive fees.

Maxim Group LLC is a broker-dealer and member of the Financial Industry Regulatory Authority, Inc. The principal business address of Maxim Group LLC is 405 Lexington Avenue, New York, New York 10174.

Notice to Prospective Investors in Canada

This prospectus constitutes an “exempt offering document” as defined in and for the purposes of applicable Canadian securities laws. No prospectus has been filed with any securities commission or similar regulatory authority in Canada in connection with the offer and sale of the shares. No securities commission or similar regulatory authority in Canada has reviewed or in any way passed upon this prospectus or on the merits of the shares and any representation to the contrary is an offence.

Canadian investors are advised that this prospectus has been prepared in reliance on section 3A.3 of National Instrument 33-105 *Underwriting Conflicts* (“NI 33-105”). Pursuant to section 3A.3 of NI 33-105, this prospectus is exempt from the requirement that the Company and the underwriter(s) provide Canadian investors with certain conflicts of interest disclosure pertaining to “connected issuer” and/or “related issuer” relationships that may exist between the Company and the underwriter(s) as would otherwise be required pursuant to subsection 2.1(1) of NI 33-105.

Resale Restrictions

The offer and sale of the shares in Canada is being made on a private placement basis only and is exempt from the requirement that the Company prepares and files a prospectus under applicable Canadian securities laws. Any resale of shares acquired by a Canadian investor in this offering must be made in accordance with applicable Canadian securities laws, which may vary depending on the relevant jurisdiction, and which may require resales to be made in accordance with Canadian prospectus requirements, pursuant to a statutory exemption from the prospectus requirements, in a transaction exempt from the prospectus requirements or otherwise under a discretionary exemption from the prospectus requirements granted by the applicable local Canadian securities regulatory authority. These resale restrictions may under certain circumstances apply to resales of the shares outside of Canada.

Representations of Purchasers

Each Canadian investor who purchases units will be deemed to have represented to the Company, the underwriters and to each dealer from whom a purchase confirmation is received, as applicable, that the investor is (i) purchasing as principal, or is deemed to be purchasing as principal in accordance with applicable Canadian securities laws, for investment only and not with a view to resale or redistribution; (ii) an “accredited investor” as such term is defined in

section 1.1 of National Instrument 45-106 *Prospectus Exemptions* or, in Ontario, as such term is defined in section 73.3(1) of the *Securities Act* (Ontario); and (iii) is a “permitted client” as such term is defined in section 1.1 of National Instrument 31-103 *Registration Requirements, Exemptions and Ongoing Registrant Obligations*.

Taxation and Eligibility for Investment

Any discussion of taxation and related matters contained in this prospectus does not purport to be a comprehensive description of all of the tax considerations that may be relevant to a Canadian investor when deciding to purchase the units and, in particular, does not address any Canadian tax considerations. No representation or warranty is hereby made as to the tax consequences to a resident, or deemed resident, of Canada of an investment in the units or with respect to the eligibility of the units for investment by such investor under relevant Canadian federal and provincial legislation and regulations.

Rights of Action for Damages or Rescission

Securities legislation in certain of the Canadian jurisdictions provides certain purchasers of securities pursuant to an offering memorandum (such as this prospectus), including where the distribution involves an “eligible foreign security” as such term is defined in Ontario Securities Commission Rule 45-501 *Ontario Prospectus and Registration Exemptions* and in Multilateral Instrument 45-107 *Listing Representation and Statutory Rights of Action Disclosure Exemptions*, as applicable, with a remedy for damages or rescission, or both, in addition to any other rights they may have at law, where the offering memorandum, or other offering document that constitutes an offering memorandum, and any amendment thereto, contains a “misrepresentation” as defined under applicable Canadian securities laws. These remedies, or notice with respect to these remedies, must be exercised or delivered, as the case may be, by the purchaser within the time limits prescribed under, and are subject to limitations and defences under, applicable Canadian securities legislation. In addition, these remedies are in addition to and without derogation from any other right or remedy available at law to the investor.

Language of Documents

Upon receipt of this document, each Canadian investor hereby confirms that it has expressly requested that all documents evidencing or relating in any way to the sale of the securities described herein (including for greater certainty any purchase confirmation or any notice) be drawn up in the English language only. *Par la réception de ce document, chaque investisseur canadien confirme par les présentes qu’il a expressément exigé que tous les documents faisant foi ou se rapportant de quelque manière que ce soit à la vente des valeurs mobilières décrites aux présentes (incluant, pour plus de certitude, toute confirmation d’achat ou tout avis) soient rédigés en anglais seulement.*

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.

EXPERTS

The consolidated financial statements as of December 31, 2017 and 2016 and for each of the two years in the period ended December 31, 2017 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 (the report on the consolidated financial statements contains an explanatory paragraph regarding the Company's ability to continue as a going concern) incorporated herein by reference in the prospectus, given on the authority of said firm as experts in auditing and accounting.

LEGAL MATTERS

Certain legal matters relating to the validity of the securities offered by this prospectus will be passed upon for us by Gibson, Dunn & Crutcher LLP, San Francisco, California.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

The Company files annual, quarterly and special reports, proxy statements and other information with the SEC. You may read and copy any document filed by the Company 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. The Company's filings with the SEC are also available to the public at the SEC's Internet web site at <http://www.sec.gov>.

Statements contained in this prospectus as to the contents of any contract or other document are not necessarily complete, and in each instance we refer you to the copy of the contract or document filed as an exhibit to the registration statement, each such statement being qualified in all respects by such reference.

INFORMATION INCORPORATED BY REFERENCE

The SEC allows the Company to "incorporate by reference" the information that is filed by the Company with the SEC, which means that the Company can disclose important information to you by referring you to those documents. The documents incorporated by reference are:

1. The Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2017, filed with the SEC on March 8, 2018;
2. The Company's Definitive Proxy Statement on Schedule 14A, filed with the SEC on March 20, 2018;
3. The Company's Current Reports on Form 8-K, filed with the SEC on February 1, 2018, February 21, 2018, April 17, 2018 and April 23, 2018;
4. The description of the Company's common stock contained in the registration statement on Form 8-A filed with the Commission on July 24, 2012 pursuant to Section 12 of the Exchange Act of 1934, as amended (the "Exchange Act"), including any amendment or report filed for the purpose of updating that description; and

5. All documents filed by the Company pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act, after the date of the original Registration Statement and prior to effectiveness of the registration statement of which this prospectus is a part, provided that all documents “furnished” by the Company to the SEC and not “filed” are not deemed incorporated by reference herein.

Any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this registration statement to the extent that a statement contained herein or in any other subsequently filed document which 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 registration statement. Under no circumstances will any information filed under items 2.02 or 7.01 of Form 8-K be deemed to be incorporated by reference unless such Form 8-K expressly provides to the contrary.

The Company will provide, without charge, to each person, including any beneficial owner, to whom a copy of this prospectus is delivered, upon such person’s written or oral request, a copy of any and all of the information incorporated by reference in this prospectus, other than exhibits to such documents, unless such exhibits are specifically incorporated by reference into the information that this prospectus incorporates. Requests should be directed to the Secretary at Atossa Genetics Inc., 107 Spring Street, Seattle, Washington, 98104, phone (866) 893-4927. You may also find these documents in the “Investor Relations” section of our website, www.atossagenetics.com. The information on our website is not incorporated into this prospectus.

PROSPECTUS

Subscription Rights to Purchase Up to 25,000 Units

Consisting of an Aggregate of Up to 25,000 Shares of Series B Convertible Preferred Stock
and Warrants to Purchase Up to 7,100,000 Shares of Common Stock
at a Subscription Price of \$1,000 Per Unit

Dealer-Manager

Maxim Group LLC

, 2018

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

ITEM 13. Other Expenses of Issuance and Distribution

The following are the estimated expenses of the distribution of the Shares registered hereunder on Form S-1 (the amounts set forth above are estimate, except the SEC Registration Fee:

Registration Fee—Securities and Exchange Commission	\$ 3,140
FINRA filing fee	\$ 3,500
Accountants Fees and Expenses	\$ 30,000
Legal Fees and Expenses	\$ 185,000
Miscellaneous	\$ 15,000
Total	\$ 236,640

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.

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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 16. Exhibit Index.

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 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement.

(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;

provided, however, that paragraphs (a)(1)(i), (a)(1)(ii) and (a)(1)(iii) of this section do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of 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:

(A) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in this Registration Statement; and

(B) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. 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 effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of this Registration Statement or made in any such document immediately prior to such effective date.

(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities: The undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or 15(d) of the Securities Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act) that is incorporated by reference in the registration statement shall be deemed to be a new registration

statement relating to the securities offered herein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

Insofar as indemnification for liabilities arising under the Securities Act, as amended, 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 SEC such indemnification is against public policy as expressed in the 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. The undersigned registrant hereby undertakes to file an application for the purpose of determining the eligibility of the trustee to act under subsection (a) of Section 310 of the Trust Indenture Act ("Act") in accordance with the rules and regulations prescribed by the Commission under Section 305(b)(2) of the Act.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Company 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 registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in Seattle, Washington, on May 3, 2018.

Atossa Genetics Inc.

By: /s/ Steven C. Quay

Steven C. Quay, M.D., Ph.D.

Chairman, Chief Executive Officer and President

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Pursuant to the requirements of the Securities Act of 1933, as amended, this 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
/s/ Steven C. Quay Steven C. Quay, M.D., Ph.D.	Chairman, Chief Executive Officer and President (Principal Executive Officer)	May 3, 2018
/s/ Kyle Guse Kyle Guse	Chief Financial Officer, General Counsel and Secretary (Principal Financial and Accounting Officer)	May 3, 2018
/s/ * Shu-Chih Chen, Ph.D.	Director	May 3, 2018
/s/ * Richard Steinhart	Director	May 3, 2018
/s/ * Stephen J. Galli, M.D.	Director	May 3, 2018
/s/ * H. Lawrence Rimmel	Director	May 3, 2018
/s/ * Gregory L. Weaver	Director	May 3, 2018

* By: /s/ Kyle Guse

Attorney-in-fact

EXHIBIT INDEX

Exhibit No.	Description	Form	Date
<u>1.1</u>	<u>Form of Dealer-Manager Agreement</u>	Amendment No. 1 to Registration Statement on Form S-1, as Exhibit 1.1	April 23, 2018
<u>3.1</u>	<u>Amended and Restated Certificate of Incorporation of Atossa Genetics Inc</u>	Registration Statement on Form S-1, as Exhibit 3.2	June 11, 2012
<u>3.2</u>	<u>Certificate of Amendment to Amended and Restated Certificate of Incorporation of Atossa Genetics Inc.</u>	Current Report on Form 8-K, as Exhibit 4.1	August 26, 2016
<u>3.3</u>	<u>Certificate of Amendment to Amended and Restated Certificate of Incorporation of Atossa Genetics Inc.</u>	Current Report on Form 8-K, as Exhibit 4.1	April 23, 2018
<u>3.4</u>	<u>Bylaws of Atossa Genetics Inc</u>	Registration Statement on Form S-1, as Exhibit 3.4	June 11, 2012
<u>3.5</u>	<u>Amendment to Bylaws of Atossa Genetics Inc.</u>	Current Report on Form 8-K, as Exhibit 3.1	December 20, 2012
<u>4.1</u>	<u>Form of Certificate of Designation of Preference, Rights and Limitations of Series B Convertible Preferred Stock</u>	Amendment No. 1 to Registration Statement on Form S-1, as Exhibit 4.1	April 23, 2018
<u>4.2</u>	<u>Form of Warrant Agreement</u>	Amendment No. 1 to Registration Statement on Form S-1, as Exhibit 4.2	April 23, 2018
<u>4.3</u>	<u>Form of Warrant Certificate</u>	Amendment No. 1 to Registration Statement on Form S-1, as Exhibit 4.3	April 23, 2018
<u>4.4</u>	<u>Form of Non-Transferable Subscription Rights Certificate</u>	Amendment No. 1 to Registration Statement on Form S-1, as Exhibit 4.4	April 23, 2018
<u>4.5</u>	<u>Registration Rights Agreement, dated as of May 25, 2016, by and between the Company and Aspire Capital Fund, LLC.</u>	Current Report on Form 8-K, as Exhibit 4.1	May 27, 2016
<u>4.6</u>	<u>Form of Warrant Agreement from January 2014 Public Offering</u>	Current Report on Form 8-K, as Exhibit 4.1	January 24, 2014
<u>4.7</u>			

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	<u>Form of Warrant issued to Dawson James Securities Inc. in January 2014</u>	Current Report on Form 8-K, as Exhibit 4.2	January 24, 2014
<u>4.8</u>	<u>Rights Agreement dated as of May 19, 2014, by and between the Company and VStock Transfer LLC, as rights agent, which includes as Exhibit B the Form of Rights Certificate</u>	Current Report on Form 8-K, as Exhibit 4.1	May 22, 2014
<u>4.9</u>	<u>Form of Common Stock Purchase Warrant A</u>	Current Report on Form 8-K, as Exhibit 4.1	December 22, 2017
<u>4.10</u>	<u>Form of Commons Stock Purchase Warrant B</u>	Current Report on Form 8-K, as Exhibit 4.2	December 22, 2017
<u>5.1</u>	<u>Opinion of Gibson, Dunn & Crutcher LLP</u>	Filed herewith	

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8.1	<u>Tax Opinion of Gibson, Dunn & Crutcher LLP</u>	Filed herewith	
10.1#	<u>Restated and Amended Employment Agreement with Steven Quay</u>	Registration Statement on Form S-1, as Exhibit 10.3	February 14, 2012
10.2	<u>Form of Indemnification Agreement</u>	Registration Statement on Form S-1, as Exhibit 10.5	May 21, 2012
10.3#	<u>Form of Incentive Stock Option Agreement</u>	Registration Statement on Form S-1, as Exhibit 10.7	June 11, 2012
10.4#	<u>Form of Non-Qualified Stock Option Agreement for Employees</u>	Registration Statement on Form S-1, as Exhibit 10.8	June 11, 2012
10.5#	<u>Form of Non-Qualified Stock Option Agreement for Non-Employee Directors</u>	Registration Statement on Form S-1, as Exhibit 10.9	June 11, 2012
10.6	<u>Form of Subscription Agreement</u>	Registration Statement on Form S-1, as Exhibit 10.10	February 14, 2012
10.7	<u>Patent Assignment Agreement by and between the Company and Ensisheim Partners, LLC</u>	Registration Statement on Form S-1, as Exhibit 10.12	April 6, 2012
10.8#	<u>Form of Restricted Stock Award Agreement</u>	Registration Statement on Form S-1, as Exhibit 10.13	June 11, 2012
10.9	<u>Office Lease with Sander Properties, LLC, dated March 4, 2011</u>	Registration Statement on Form S-1, as Exhibit 10.20	April 6, 2012
10.10	<u>Office Lease with Sander Properties, LLC, dated July 8, 2011</u>	Registration Statement on Form S-1, as Exhibit 10.21	April 6, 2012
10.11	<u>Office Lease with Sander Properties, LLC, dated September 20, 2011</u>	Registration Statement on Form S-1, as Exhibit 10.22	April 6, 2012
10.12	<u>Sublease with Fred Hutchinson Cancer Research Center, dated December 9, 2011</u>	Registration Statement on Form S-1, as Exhibit 10.23	April 6, 2012
10.13#	<u>Amended and Restated Employment Agreement between the Company and Kyle Guse dated May 18, 2016</u>	Current Report on Form 8-K, as Exhibit 10.1	May 20, 2016
10.14	<u>Office space Lease dated July 18, 2013 between Alexandria (ARE) and the Company</u>	Annual Report on Form 10-K, as Exhibit 10.33	March 27, 2014
10.15	<u>Common Stock Purchase Agreement, between the Company and Aspire Capital Fund, LLC, dated as of November 11, 2015</u>	Quarterly Report on Form 10-Q, as Exhibit 10.1	November 12, 2015

10.16 Common Stock Purchase Agreement, between the Company Current Report on Form 8-K, May 27, 2016
 and Aspire Capital Fund, LLC, dated as of May 25, 2016 as Exhibit 10.1

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<u>10.17</u>	<u>Lab and Office space Lease Agreement dated March 24, 2014 between Alexandria (ARE) and the Company</u>	Annual Report on Form 10-K, as Exhibit 10.33	March 27, 2014
<u>10.18</u>	<u>Office Space Assignment and Assumption of Lease and Consent to Assignment dated August 8, 2014 between Legacy Group, Inc. and the Company</u>	Quarterly Report on Form 10-Q, as Exhibit 10.1	August 12, 2014
<u>10.19</u>	<u>Intellectual Property License Agreement between Atossa Genetics Inc. and Besins Healthcare Luxembourg SARL, dated May 14, 2015</u>	Current Report on Form 8-K, as Exhibit 10.1	May 18, 2015
<u>10.20</u>	<u>Settlement and Termination of License Agreement between Besins Healthcare Luxembourg SARL and its Affiliates and Atossa Genetics, Inc. dated August 4, 2016</u>	Current Report on Form 8-K, as Exhibit 10.1	August 5, 2016
<u>10.21</u>	<u>Stock Purchase Agreement by and among the Company, the National Reference Laboratory for Breast Health, Inc. and NRL Investment Group, LLC, dated December 16, 2015</u>	Current Report on Form 8-K, as Exhibit 10.1	December 16, 2015
<u>10.22</u>	<u>Office space Lease Agreement dated October 1, 2015 between Hughes-Northwest and the Company.</u>	Annual Report on Form 10-K, as Exhibit 10.35	March 30, 2016
<u>10.23</u>	<u>2010 Stock Option and Incentive Plan, as amended</u>	Quarterly Report on Form 10-Q, as Exhibit 10.2	May 11, 2017
<u>10.24</u>	<u>Placement agreement between Atossa Genetics Inc. and Maxim Corp. as representative of the Purchasers, dated December 20, 2017</u>	Current Report on Form 8-K, as Exhibit 10.1	December 22, 2017
<u>10.25</u>	<u>Securities Purchase agreement between Atossa Genetics Inc. and each purchaser</u>	Current Report on Form 8-K, as Exhibit 10.1	December 22, 2017
<u>23.1</u>	<u>Consent of BDO USA LLP</u>	Filed herewith	
<u>23.2</u>	<u>Consent of Gibson, Dunn & Crutcher LLP</u>	Filed as part of Exhibit 5.1 to this Registration Statement on Form S-1	
<u>24.1</u>	<u>Powers of Attorney</u>	Previously included on the signature page in Part II of this Registration Statement on Form S-1	March 27, 2018
<u>99.1</u>	<u>Form of Instructions as to Use of Subscription Rights Certificates</u>	Filed herewith	
<u>99.2</u>	<u>Form of Letter to Shareholders Who Are Record Holders</u>	Filed herewith	

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<u>99.3</u>	<u>Form of Letter to Brokers, Dealers, Banks and Other Nominees</u>	Filed herewith	
<u>99.4</u>	<u>Form of Broker Letter to Clients Who Are Beneficial Holders</u>	Filed herewith	
<u>99.5</u>	<u>Form of Beneficial Owner Election Form</u>	Amendment No. 1 to Registration Statement on Form S-1, as Exhibit 99.5	April 23, 2018
<u>99.6</u>	<u>Form of Nominee Holder Certification</u>	Amendment No. 1 to Registration Statement on Form S-1, as Exhibit 99.6	April 23, 2018
<u>99.7</u>	<u>Form of Notice of Important Tax Information</u>	Amendment No. 1 to Registration Statement on Form S-1, as Exhibit 99.7	April 23, 2018

Indicates management contract or compensatory plan, contractor or agreement.