As filed with the Securities and Exchange Commission on November 20, 2020

Registration No. 333-

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

FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

Atossa Therapeutics, Inc.

(Exact name of Registrant as specified in its charter)

Delaware	2834	26-4753208
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

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Telephone: (866) 893-4927
(Address, including zip code, and telephone number, including area code, of Registrant's principal executive offices)

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Approximate date of commencement of proposed sale to the public:
As soon as practicable after the effective date of this Registration Statement.

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

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

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth 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.

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	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 pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered(1)(2)	**Proposed maximum aggregate offering price(3)**	**Amount of registration fee**
Common stock, $0.18 par value per share		
Series C convertible preferred stock, par value $0.001 per share(4)		
Total	$ 14,375,000	$ 1,568.31

(1) Pursuant to Rule 416 under the Securities Act of 1933, as amended, the securities being registered hereunder include such indeterminate number of additional securities as may be issuable to prevent dilution resulting from stock splits, dividends or similar transactions.

(2) The proposed maximum aggregate offering price of the common stock to be sold in the offering will be reduced on a dollar-for-dollar basis on the offering price of any Series C convertible preferred sold, such that the proposed maximum aggregate offering price of the common stock and Series C convertible preferred shares (including the common stock issuable upon exercise of the Series C convertible preferred shares, if any), is $13,800,000. Such maximum aggregate offering price includes $1,875,000 in shares that may be sold pursuant to the underwriter's over-allotment option.

(3) Estimated solely for the purpose of calculating the amount of the registration fee in accordance with Rule 457(o) under the Securities Act of 1933, as amended. The issuer is offering a combination of Common Stock and Series C convertible preferred stock for aggregate offering proceeds of up to $14,375,000.

(4) Includes shares of Common Stock issuable upon conversion of Series C convertible preferred stock issued hereunder.

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 or until the Registration Statement shall become effective on such date as the 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 November 20, 2020
Preliminary Prospectus

Up to Shares of Common Stock and
Up to Shares of Series C Convertible Preferred Stock

We are offering up to shares of our common stock, par value $0.18 per share (the "common stock"). We are also offering to certain large investors the opportunity to purchase, in lieu of the shares of our common stock, up to shares of Series C convertible preferred stock, which is convertible into a total of shares of common stock, subject to certain beneficial ownership conversion limitations.

Our common stock is currently quoted on The Nasdaq Capital Market ("Nasdaq") under the symbol "ATOS". On , 2020, the last reported sale price per share of our common stock on Nasdaq was $. There is no trading market for the Series C convertible preferred stock and we do not currently intend to apply for listing of the Series C convertible preferred stock on any securities exchange or recognized trading system.

Investing in our securities involves risks. You should carefully consider the Risk Factors included in this prospectus before you make an investment in our securities.

	Per-Share (Common Stock)	Per-Share (Preferred Stock)	Total
Public offering price	$	$	$
Underwriting discount (1)	$	$	$
Proceeds, before expenses, to us	$	$	$

(1) See the section titled "Underwriting" for additional information regarding compensation payable to the underwriter.

We have granted the underwriter an option to purchase up to additional shares of our common stock at the public offering price, less the underwriting discount, for 45 days after the date of this prospectus.

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

The shares will be ready for delivery on or about , 2020.

Sole Book-Running Manager

MAXIM GROUP LLC

The date of this prospectus is , 2020

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ABOUT THIS PROSPECTUS

We have not, and the underwriters have not, authorized anyone to provide you with information that is different from that contained in this prospectus we may authorize to be delivered or made available to you. When you make a decision about whether to invest in our securities, you should not rely upon any information other than the information in this prospectus or in any free writing prospectus that we may authorize to be delivered or made available to you. Neither the delivery of this prospectus nor the sale of our securities means that the information contained in this prospectus or any free writing prospectus is correct after the date of this prospectus or such free writing prospectus. This prospectus is not an offer to sell or the solicitation of an offer to buy our securities in any circumstances under which the offer or solicitation is unlawful.

For investors outside the United States: We have not, and the underwriters have not, taken any action 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 the securities covered hereby and the distribution of this prospectus outside the United States.

Unless otherwise indicated, information contained in this prospectus concerning our industry and the markets in which we operate, including our general expectations and market position, market opportunity and market share, is based on information from our own management estimates and research, as well as from industry and general publications and research, surveys and studies conducted by third parties. Management estimates are derived from publicly available information, our knowledge of our industry and assumptions based on such information and knowledge, which we believe to be reasonable. Our management estimates have not been verified by any independent source, and we have not independently verified any third-party information. In addition, assumptions and estimates of our and our industry's future performance are necessarily subject to a high degree of uncertainty and risk due to a variety of factors, including those described in "Risk Factors." These and other factors could cause our future performance to differ materially from our assumptions and estimates. See "Cautionary Note Regarding Forward-Looking Statements."

We further note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit to the registration statement of which this prospectus is a part were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties thereto, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

Unless the context otherwise requires, references in this prospectus to "Atossa," "the Company," "we," "us" and "our" refer to Atossa Therapeutics, 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 or the accompanying prospectus are the property of their respective owners.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains, 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"). We have made these statements in reliance on the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These statements are subject to certain risks and uncertainties, which could cause actual results to differ materially from those projected or anticipated. Although we believe our assumptions underlying our forward-looking statements are reasonable as of the date of this prospectus, we cannot assure you that the forward-looking statements set out in this prospectus will prove to be accurate. We typically identify these forward-looking statements by the use of forward-looking words such as "expect," "potential," "continue," "may," "will," "should," "could," "would," "seek," "intend," "plan," "estimate," "anticipate" or the negative version of those words or other comparable words. Forward-looking statements contained in this prospectus include, but are not limited to, statements about:

- the impact of the ongoing coronavirus pandemic and the degree to which the pandemic negatively impacts our supply chain, clinical trial enrollment and timing and our ability to access capital markets;
- whether we can obtain approval from the U.S. Food and Drug Administration ("FDA"), and foreign regulatory bodies, to commence our clinical trials, including our planned COVID-19 trials, and to sell, market and distribute our therapeutics under development;
- our ability to successfully initiate and complete clinical trials of our pharmaceutical candidates under development, including our oral and topical Endoxifen (an active metabolite of Tamoxifen);
- the success, cost and timing of our product and drug development activities and clinical trials, including whether our study using our oral Endoxifen will enroll a sufficient number of subjects or be completed in a timely fashion or at all;
- whether we will successfully initiate and complete our clinical trial of oral Endoxifen to reduce mammographic breast density and whether the study will meet its objective;
- 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;
- whether the final study results will vary from preliminary study results that we may announce;
- 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.

These and other forward-looking statements made herein are presented as of the date of this prospectus. We have included important factors in the cautionary statements included in this prospectus, particularly in the section titled Risk Factors that we believe could cause actual results or events to differ materially from the anticipated results as set forth in 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

Company Overview

We are a clinical-stage biopharmaceutical company seeking to discover and develop innovative medicines in areas of significant unmet medical need with a focus on coronavirus ("COVID-19"), breast cancer and other breast conditions. Our two COVID-19 drugs under development are AT-H201, to improve lung function of moderate to severely ill, hospitalized COVID-19 patients by inhalation, and AT-301, a nasal spray for COVID-19 patients for at-home use. Our drug under development for breast cancer and other breast conditions is Endoxifen which is being developed primarily in two settings: one to reduce tumor cell activity in breast cancer patients in the "window of opportunity" between diagnosis of breast cancer and surgery; and another for women with dense breast tissue to reduce the density and/or to act as an adjunct to mammography.

Summary of Leading Programs

A summary of our four leading programs is as follows:

AT-301. AT-301 is our proprietary drug candidate intended for nasal administration in patients immediately following diagnosis of COVID-19 but who have not yet exhibited symptoms severe enough to require hospitalization. It is intended for at-home use to proactively reduce symptoms of COVID-19 and to slow the infection rate so that a person's immune system can more effectively fight COVID-19. We also intend to conduct testing to determine whether AT-301 can be used as a prophylaxis to prevent or mitigate SARS-CoV-2, with the goal that it could complement any traditional vaccine that may be developed in that a traditional vaccine may not be effective in all people and may not be taken by all people.

AT-301 is being developed with a nasal spray delivery mechanism because many COVID-19 patients are infected via the nasal passage. Collectively, the components of AT-301 are believed to help maintain a protective mucosal like layer within the nasal cavity with both anti-viral properties and a protective mucosal like barrier that may lead to lower infectivity and reduced symptoms in COVID-19 patients due to their interference with the spike protein of the virus in the nasal cavity and upper respiratory tract. Our nasal spray formulation AT-301 is being designed to contain ingredients that can potentially block SARS-CoV-2 viral entry gene proteins in nasal epithelial cells by interfering with spike protein activation by host proteases, by masking receptor binding domains (RBD) via electrostatic mechanisms, and by providing a generalized mucoadhesive epithelial barrier.

In July 2020, we completed in vitro testing of AT-301 which showed that AT-301 inhibits SARS-CoV-2 infectivity of VERO cells in a laboratory culture.

We recently completed a Phase 1 study of AT-301 which was a double-blinded, randomized, and placebo-controlled safety study of AT-301 nasal spray in 32 healthy adult subjects divided into two study groups. Part A consisted of two single-dose cohorts receiving either active therapy, AT-301B, or the placebo comparator AT-301A at two doses. Part B was a multiple dose arm with cohorts receiving either AT-301A or AT-301B for 14 days at two doses. The primary objective of the study is to evaluate the safety and tolerability of single and multiple doses of AT-301 administered via nasal instillation to healthy volunteers. Secondary objectives are to assess the incidence and severity of local irritation and bronchospasm following administration of AT-301 via nasal instillation. Dosing is complete and data output is expected in January 2021. A preliminary evaluation of the blinded data indicates that there we no serious adverse events, no discontinuations, and only one of the subjects in the study experienced adverse events that were considered moderate in severity; all other adverse events were considered mild. Our preliminary assessment is that our AT-301 nasal spray was safe and well tolerated in this study. These results support advancing this program into a Phase 2 study. We are in the process of preparing a pre-IND meeting request with the U.S. FDA which we plan to submit in December 2020.

AT-H201. AT-H201 is a proprietary combination of two drugs previously approved by the FDA to treat other diseases. It is intended to improve compromised lung function for moderate to severely ill, hospitalized COVID-19 patients by inhalation. There are five known key steps the coronavirus must take to signal the cell to open up and let the virus in. AT-H201 is being designed to function like a "chemical vaccine" by blocking all five of those steps, similar to what antibodies would be expected to do when a vaccine is administered. In May 2020, we completed in vitro testing of AT-H201 which showed that the components of AT-H201 inhibit SARS-CoV-2 infectivity of VERO cells, which is a standard cell type being used to study infectivity of the coronavirus. The AT-H201 components were found to be at least four times more potent than remdesivir and at least 20 times more potent than hydroxychloroquine. Potency was measured by microscopic examination of the cytopathic effect caused by SARS-CoV-2 in VERO cells. Developing new drugs that combine drugs previously approved by the FDA typically requires pre-clinical and clinical studies of the individual components of the new drug as well as the combination of the components in the new drug. In the second quarter 2020, we requested a pre-IND meeting with the FDA to discuss the AT-201 program, including a proposed study at NYC Health + Hospitals/Metropolitan in New York City. The FDA requested that we provide, among other things, additional pre-clinical and other information on AT-H201. We also requested a pre-IND meeting with the FDA to discuss one of the components of AT-H201, to which the FDA provided guidance. We are evaluating conducting the study outside the United States. We plan to commence the initial clinical study of AT-H201 in the first quarter of 2021.

We have filed provisional patent applications on AT-H201 to treat COVID-19 patients and on AT-301 to treat patients diagnosed with, or to prevent, COVID-19 via nasal spray.

Endoxifen for MBD. Mammographic breast density (MBD) is an emerging public health issue affecting over 10 million women in the U.S. Studies conducted by others have shown that MBD increases the risk of developing breast cancer and that reducing MBD can reduce the incidence of breast cancer. In December 2019, we contracted with Stockholm South General Hospital to conduct a randomized, double-blinded, placebo-controlled study of our oral Endoxifen in pre-menopausal women with MBD who will be dosed over six months. This study will evaluate safety, tolerability and efficacy. The primary endpoint is the change of MBD after six months of daily Endoxifen treatment. We are planning for the study to be conducted in Stockholm, Sweden. The study is subject to approval by the European Medical Product Authority (MPA) which we expect to receive in December 2020.

In June 2019, we reported preliminary analysis from our Phase 2 study of proprietary daily topical Endoxifen to reduce MBD, showing significant (p=0.02) and rapid reduction in MBD at the 20mg daily dose level. MBD was reduced by an average of 14.3% in the group applying 20mg daily topical Endoxifen, which was statistically significant (p=0.02). In the lower dose group (10mg), MBD was reduced by an average of 9.0%, but was not statistically significant. Approximately 70% of participants receiving 20mg topical Endoxifen experienced a reduction in MBD, and of those, the mean reduction in MBD was 27%. Many participants in this study, however, experienced adverse skin reactions and dropped out of the study. We plan to reevaluate our development strategy for the topical form of Endoxifen once we complete the Phase 2 study of oral Endoxifen to reduce MBD.

Endoxifen for Window of Opportunity. We are currently conducting a Phase 2 study in Australia in the window of time between diagnosis of breast cancer and surgical treatment. The study will enroll up to 25 newly-diagnosed patients with ER+ and human epidermal growth factor receptor 2 negative (HER2-) stage 1 or 2 invasive breast cancer, requiring mastectomy or lumpectomy. Patients will receive Atossa's proprietary oral Endoxifen for at least 14 days from the time of diagnosis up to the day of surgery. The primary endpoint is to determine if the administration of oral Endoxifen reduces the tumor activity as measured by Ki-67. The secondary endpoints are safety and tolerability and assessment of the study drug on expression levels of both estrogen and progesterone receptors. The impact on additional markers of cellular activity will also be explored.

In May 2020, we reported interim results from our window of opportunity study. A statistically significant (p=0.031) reduction of about 74% in tumor cell proliferation, as measured by Ki-67, over the 22 days of dosing was achieved in the initial patients. Ki-67 is a recognized standard measurement of breast cancer cell proliferation. The purpose of this study is to determine if Atossa's oral Endoxifen reduces breast cancer tumor cell proliferation as measured by several biomarkers, including Ki-67. Six out of six (100%) patients experienced a significant reduction in Ki-67. A summary of these results includes:

- Ki-67 was reduced by more than 50% in every patient in the window of opportunity between initial biopsy and surgery, with an overall relative reduction of 74%.
- All six patients had a Ki-67 below 25% after treatment. In a paper entitled, "Prognostic value of different cut-off levels of Ki-67 in breast cancer: a systematic review and meta-analysis of 64,196 patients," Ki-67 was an independent prognostic value for predicting overall survival in ER+ breast cancer patients. Ki-67 levels below 25% were associated with the lowest risk of death in this systematic review and meta-analysis.

- Treatment ranged from 16-40 days with an average of 22 days.
- There were no safety or tolerability issues, including vasomotor symptoms such as hot flashes and night sweats, which are often a tolerability challenge for patients on tamoxifen.

This study continues to be open for enrollment; however, enrollment has been slower than anticipated in part due to fewer patients undergoing breast cancer surgery in Australia as a result of the Coronavirus pandemic.

About Endoxifen

Endoxifen is an active metabolite of tamoxifen which is an FDA-approved drug to treat and prevent breast cancer in high risk women. Endoxifen has been studied in 70 participants in Atossa-conducted Phase 1 clinical studies. No serious adverse events were reported in any of the studies.

In May 2020, we reported that the FDA recently provided written input on our clinical path for oral Endoxifen to reduce MBD. The input was provided pursuant to a pre-IND meeting request which was scheduled for April 30, 2020. The input received from the FDA was very useful and will inform our clinical trial strategy and study design both in the U.S. and in Stockholm, Sweden where we are planning a Phase 2 study to reduce MBD.

Compassionate Use of Endoxifen

In December 2018, we began providing our oral Endoxifen to a pre-menopausal, estrogen-receptor positive (ER+), lacking CYP2D6 function, breast cancer patient under an FDA-approved expanded access, single patient, or "compassionate use" program. The purpose of this therapeutic approach was to reduce activity of the cancer cells prior to surgery. The patient received daily doses of our oral Endoxifen for approximately three weeks prior to surgery. There were no safety or tolerability issues and her surgery was successfully completed. The cancer cell biological activity was reduced, based on the estrogen receptor activity of the tumor cells and a 50% reduction in Ki-67. The FDA has also permitted use of our Endoxifen for this patient following her surgery, under the compassionate use program, as part of her long-term breast cancer treatment regimen. The use of our proprietary oral Endoxifen is restricted solely to this patient. In July 2020, we reported an update on this patient, who has received Endoxifen for 18 months post-surgery. To date, the patient has not had a recurrence of breast cancer, has not had treatment-related changes in periodic laboratory blood tests and the treatment has been well tolerated, including an absence of typically seen vasomotor symptoms (night sweats and hot flashes).

Research and Development Phase

We are in the research and development phase and are not currently marketing any products. We do not anticipate generating revenue unless and until we develop and launch our pharmaceutical programs.

Impact of the Novel Coronavirus

The continued spread of the COVID-19 pandemic is affecting the United States and global economies and may affect the Company's operations and those of third parties on which the Company relies, including causing possible disruptions in the supply of the Company's Endoxifen, AT-H201, AT-301 and the conduct of current and future clinical trials. In addition, the COVID-19 pandemic may affect the operations of the U.S. Food and Drug Administration and other health authorities including similar entities/agencies in Sweden and Australia, which could result in delays in meetings, reviews and approvals. The evolving COVID-19 pandemic could also directly or indirectly impact the pace of enrollment in the Company's clinical trials for at least the next several months and possibly longer as patients may avoid or may not be able to travel to healthcare facilities and physicians' offices except for a health emergency. Such facilities and offices may also be required to focus limited resources on non-clinical trial activities, including treatment of COVID-19 patients, and may not be available, in whole or in part, for clinical trial activities related to the Company's products under development. Additionally, while the potential economic impact brought by, and the duration of, the COVID-19 pandemic is difficult to assess or predict, the impact of the COVID-19 pandemic on the global financial markets may reduce the Company's ability to access capital, which could negatively impact the Company's short-term and long-term liquidity. The ultimate impact of the COVID-19 pandemic is highly uncertain and subject to change. The Company does not yet know the full extent of potential delays or impacts on its business, financing or clinical trial activities or on healthcare systems or the global economy as a whole. However, these effects could have a material adverse impact on the Company's liquidity, capital resources, operations, financial position and business and those of the third parties on which we rely. As of September 30, 2020, the Company has not experienced any delay in drug supply for its ongoing and planned clinical studies, including studies of Endoxifen, AT-301 and AT-H201. Currently, enrollment is open in Australia for the Endixofen Window of Opportunity study for which enrollment continues to be slow due in part to disruption caused by COVID-19. The Company anticipates commencing the MBD Endoxifen trial in the fourth quarter of 2020. The Company opened enrollment in the AT-301 trial during the third quarter of 2020 and completed enrollment in the fourth quarter 2020. We anticipate receiving regulatory approval to commence the initial clinical study of one of the components of AT-H201 in the first quarter of 2021. The Company will continue to monitor future enrollment in studies for potential restrictions on site visits, mammograms or the impositions of new restrictions on trials as a result of the COVID-19 pandemic.

Corporate Information

We were incorporated in the state of Delaware in 2009. On January 6, 2020, we changed our corporate name from Atossa Genetics Inc. to Atossa Therapeutics, Inc. Our corporate headquarters are located at 107 Spring Street, Seattle, Washington 98104. Our telephone number is (206) 588-0256 and our Internet website address is www.atossatherapeutics.com. We do not incorporate the information on our website into this prospectus, and you should not consider it part of this prospectus.

THE OFFERING

Securities Offered:	Up to shares of common stock. We are also offering to certain large investors the opportunity to purchase, in lieu of the shares of our common stock, up to shares of Series C convertible preferred stock, which is convertible into a total of shares of common stock, subject to certain beneficial ownership conversion limitations.
Underwriter Overallotment:	We have granted the Representative an option to purchase up to additional shares of common stock at the public offering price, less the underwriting discounts and commissions. This option is exercisable, in whole or in part, for a period of 45 days from the date of this prospectus.
Price per share:	$ per share of common stock, or $ per share of Series C convertible preferred common stock.
Series C Convertible Preferred Stock:	Each whole share of Series C convertible preferred stock is convertible into 1,000 shares of common stock at any time so long as the holder, together with its affiliates, and any other person acting as a group together with the holder or any of its affiliates, does not own excess of 4.99% of the number of shares of our common stock outstanding immediately after giving effect to its exercise.
Common stock outstanding before this offering:	shares of common stock.
Common stock outstanding after this offering:	shares of common stock, determined on an as-converted basis (without regard to any beneficial ownership conversion limitations).
Use of proceeds:	We intend to use the net proceeds from this offering for general corporate purposes. See "Use of Proceeds."
Risk Factors:	Investing in our common or preferred stock involves a high degree of risk. See the information contained in or incorporated by reference under the heading "*Risk Factors*" and in the documents incorporated by reference and any free writing prospectus that we authorize for use in connection with this offering.
Market symbol and trading:	Our common stock is listed on The Nasdaq Capital Market under the symbol "ATOS." There is no established trading market for the Series C convertible preferred stock and we do not expect a market to develop. We do not intend to apply for the listing of the preferred stock on any securities exchange or other trading market.

The number of shares of our common stock to be outstanding after this offering is based on shares of our common stock outstanding as of September 30, 2020 and excludes:

- shares of our common stock that have been sold or may be sold in the future in connection with our current "at-the-market" offering;
- 1,070,028 shares of common stock issuable upon the exercise of outstanding warrants as of September 30, 2020, at an exercise price of $4.05 per share;
- 7,079,831 shares of common stock issuable upon the exercise of options issued under the Company's 2010 and 2020 Stock Option and Incentive Plans at a weighted average exercise price of $2.77 per share as of September 30, 2020;
- 177,562 shares of common stock issuable upon the conversion of outstanding Series B convertible preferred stock as of September 30, 2020; and
- 670,000 shares of common stock reserved for issuance pursuant to future equity awards under our 2020 Plan as of September 30, 2020, as well as any future increases in the number of shares of our common stock reserved for future issuance under the 2020 Plan.

Except as otherwise indicated herein, all information in this prospectus, including the number of shares that will be outstanding after this offering, assumes no exercise by the underwriters of their option to purchase additional securities.

RISK FACTORS

An investment in our securities involves a high degree of risk. You should carefully consider the risks and uncertainties described below as well as the risks and uncertainties set forth under the section titled "*Risk Factors*" in our Annual Report on Form 10-K for the year ended December 31, 2019, and our Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, which are incorporated by reference herein, before deciding whether to purchase securities. You should also refer to the other information contained in this prospectus and the documents incorporated by reference herein, including our audited consolidated financial statements and related notes and the section titled "*Management's Discussion and Analysis of Financial Condition and Results of Operations*" included in our Annual Report on Form 10-K for the year ended December 31, 2019, and our Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, which are incorporated by reference herein. Our business, financial condition, results of operations and prospects could be materially and adversely affected by any of these risks or uncertainties. In any such case, the trading price of our common stock could decline, and you could lose all or part of your investment.

Risks Related to this Offering

If you purchase our securities in this offering, you may incur immediate and substantial dilution in the book value of your shares.
The public offering price per share may be substantially higher than the net tangible book value per share of our common stock immediately prior to the offering. After giving effect to the assumed sale of shares of common stock (determined on an as-converted basis) in this offering, at an assumed public offering price of $ per share, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, purchasers of our common stock in this offering will incur immediate dilution of $ per share in the net tangible book value of the common stock they acquire. For a further description of the dilution that investors in this offering may experience, see "*Dilution*." In addition, to the extent that outstanding stock options or warrants have been or may be exercised or other shares issued, you may experience further dilution.

You may experience future dilution as a result of future equity offerings.
In order to raise additional capital, we may at any time, including during the pendency of this offering, offer additional shares of our common stock or other securities convertible into or exchangeable for our common stock at prices that may not be the same as the price per share in this offering (including in our current "at-the-market" offering in which we are offering shares of our common stock pursuant to a prospectus supplement filed by the Company with the SEC on September 25, 2020 (Registration No. 333-248555)). We may sell shares or other securities in any other offering at a price per share that is less than the price per share paid by investors in this offering, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders. The price per share at which we sell additional shares of our common stock, or securities convertible or exchangeable into common stock, in future transactions may be higher or lower than the price per share paid by investors in this offering

We have broad discretion in the use of our cash and cash equivalents, including the net proceeds we receive in this offering, and may not use them effectively.
Our management has broad discretion to use our cash and cash equivalents, including the net proceeds we receive in this offering, to fund our operations and could spend these funds in ways that do not improve our results of operations or enhance the value of our common stock, and you will not have the opportunity as part of your investment decision to assess whether the net proceeds are being used appropriately. The failure by our management to apply these funds effectively could result in financial losses that could have a material adverse effect on our business, cause the price of our common stock to decline and delay the development of our product candidates. Pending their use to fund our operations, we may invest our cash and cash equivalents, including the net proceeds from this offering, in a manner that does not produce income or that loses value.

Because we do not intend to declare cash dividends on our shares of common stock in the foreseeable future, stockholders must rely on appreciation of the value of our common stock for any return on their investment.
We have never declared or paid cash dividends on our common stock. We currently anticipate that we will retain future earnings, if any, for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends in the foreseeable future. In addition, the terms of any existing or future debt agreements may preclude us from paying dividends. As a result, we expect that only appreciation of the price of our common stock, if any, will provide a return to investors in this offering for the foreseeable future.

There is no public market for the Series C Convertible Preferred Stock in this offering.
There is no established public trading market for the Series C 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 C convertible preferred stock on any securities exchange or recognized trading system. The ability to convert the Series C convertible preferred stock to common stock will be subject to a beneficial ownership conversion limit, which may further impair the liquidity of this investment.

USE OF PROCEEDS

We estimate that the net proceeds to us from the sale of the securities offered by this prospectus in this offering will be approximately $ million (or $ million if the underwriters fully exercise their overallotment option) after deducting commissions and estimated offering expenses payable by us.

We currently intend to use the net proceeds from this offering for general corporate purposes, including clinical studies of our products under development. We may also use a portion of the net proceeds for the acquisitions of businesses, products, technologies or licenses that are complementary to our business, although we have no present commitments or agreements to do so.

The allocation of the net proceeds of the offering set forth above represents our estimates based upon our current plans and assumptions regarding industry and general economic conditions, our future revenues and expenditures. The amounts and timing of our actual expenditures may vary significantly and will depend on numerous factors, regulatory requirements, cash used by our operations, the extent to which we receive project funding from government grants and other third party collaborators and other business developments and opportunities that may arise. We may find it necessary or advisable to use portions of the proceeds from this offering for other purposes.

We believe that the net proceeds of this offering, together with cash on hand, will be sufficient to fund our operations for at least the next 12-18 months. Additional capital may not be available on terms favorable to us, or at all. If we raise additional funds by issuing equity securities, including in our current at-the-market offering program, our stockholders may experience dilution. Debt financing, if available, may involve restrictive covenants or additional security interests in our assets. Any additional debt or equity financing that we complete may contain terms that are not favorable to us or our stockholders. If we raise additional funds through collaboration and licensing arrangements with third parties, it may be necessary to relinquish some rights to our technologies or products or grant licenses on terms that are not favorable to us. If we are unable to raise adequate funds, we may have to delay, reduce the scope of, or eliminate some or all of, our development programs or liquidate some or all of our assets.

Pending our use of the net proceeds from this offering, we intend to invest the net proceeds in a variety of capital preservation investments, including short-term, investment grade, interest bearing instruments and U.S. government securities.

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 C 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 C convertible preferred stock will likely be through a sale of those shares.

DILUTION

Purchasers of our common stock will experience an immediate dilution of the net tangible book value per share of our common stock. Our net tangible book value as of September 30, 2020 was approximately $, or $ per share of common stock (based upon shares of our common stock then outstanding (calculated on an as-converted basis) and assuming no exercise of the underwriter's overallotment option). 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 (calculated on an as-converted basis).

Dilution per share of common stock equals the difference between the offering price per share and the net tangible book value per share of our common stock immediately after this offering.

Based on the sale by us of shares of common stock (calculated on an as-converted basis) at $ per share and after deducting estimated offering expenses and underwriter fees and expenses payable by us, our pro forma net tangible book value as of September 30, 2020 would have been approximately $, or $ per share. This represents an immediate increase in pro forma net tangible book value to existing stockholders of $ per share and an immediate dilution to purchasers in the rights offering of $ per share. The following table illustrates this per-share dilution:

Offering price per share		$
Tangible book value per common share as of September 30, 2020	$	
Increase in tangible book value per common share attributable to this offering	$	
As adjusted tangible book value per common share after this offering		$
Dilution in tangible book value per common share to new investors		$

A $0.50 increase (decrease) in the assumed offering price of $ per share would increase (decrease) our as adjusted tangible book value per share after this offering by approximately $, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting the underwriting discounts and estimated offering expenses payable by us.

If the underwriters' option to purchase additional shares is exercised in full, the pro forma tangible book value per share after giving effect to this offering would be approximately $ per share, and the dilution in pro forma as adjusted tangible book value per share to investors in this offering would be approximately $ per share.

The above discussion and table is as of September 30, 2020, and excludes:

- shares of our common stock that have been sold or may be sold in the future in connection with our current "at-the-market" offering;
- 1,070,028 shares of common stock issuable upon the exercise of outstanding warrants as of September 30, 2020, at an exercise price of $4.05 per share;
- 7,079,831 shares of common stock issuable upon the exercise of options issued under the Company's 2010 and 2020 Stock Option and Incentive Plans at a weighted average exercise price of $2.77 per share as of September 30, 2020;
- 177,562 shares of common stock issuable upon the conversion of outstanding Series B convertible preferred stock as of September 30, 2020; and
- 670,000 shares of common stock reserved for issuance pursuant to future equity awards under our 2020 Plan as of September 30, 2020, as well as any future increases in the number of shares of our common stock reserved for future issuance under the 2020 Plan.

DESCRIPTION OF SECURITIES

Common Stock

The terms and provisions of our common stock are incorporated by reference to Exhibit 4.16 (Description of Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934) of our Annual Report on Form 10-K for the year ended December 31, 2019.

Series C Convertible Preferred Stock.

The terms and provisions of our Series C convertible preferred stock are:

Conversion. Each share of Series C convertible preferred stock is convertible into 1,000 shares of our common stock at any time so long as the holder, together with its affiliates, and any other person acting as a group together with the holder or any of its affiliates, does not own excess of 4.99% of the number of shares of our common stock outstanding immediately after giving effect to its exercise. In addition, the conversion ratio is subject to adjustment for stock dividends, distributions, subdivisions, combinations or reclassifications of the underlying common stock.

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 C convertible preferred stock, the holders of the Series C 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 C convertible preferred stock.

Dividends. Holders of Series C 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 C convertible preferred stock has no voting rights.

Liquidation Preference. Upon our liquidation, dissolution or winding-up, whether voluntary or involuntary, holders of Series C 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 C 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 C convertible preferred stock. Shares of Series C convertible preferred stock are not otherwise entitled to any redemption rights, or mandatory sinking fund or analogous provisions.

UNDERWRITING

We have entered into an underwriting agreement with Maxim Group LLC as the sole representative of the underwriters ("Maxim" or the "Representative"), with respect to the shares being offered. Maxim is the sole book running manager for the offering. Subject to the terms and conditions of an underwriting agreement between us and Maxim, we have agreed to sell to each underwriter named below, and each underwriter named below has severally agreed to purchase, at the public offering price less the underwriting discounts set forth on the cover page of this prospectus, the number of shares of common stock and Series C convertible preferred shares next to its name in the following table:

Name of Underwriter	Number of Common Shares	Number of Series C Preferred Shares
Maxim Group LLC		
Total		

The underwriters are committed to purchase all the shares of common stock and Series C convertible preferred shares (the "shares") offered by this prospectus if they purchase any shares. The underwriting agreement also provides that if an underwriter defaults, the purchase commitments of non-defaulting underwriters may be increased or the offering may be terminated. The underwriters are not obligated to purchase the shares covered by the underwriters' over-allotment option described below. The underwriters are offering the shares, subject to prior sale, when, as and if issued to and accepted by them, subject to approval of legal matters by their counsel, and other conditions contained in the underwriting agreement, such as the receipt by the underwriters of officer's certificates and legal opinions. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

Over-Allotment Option

We have granted to the underwriters an option, exercisable no later than 45 calendar days after the date of the underwriting agreement, to purchase up to an additional shares of common stock at the public offering price listed on the cover page of this prospectus, less underwriting discounts and commissions, solely for the purpose of covering over-allotments. To the extent the option is exercised and the conditions of the underwriting agreement are satisfied, we will be obligated to sell to the underwriters, and the underwriters will be obligated to purchase, these additional shares.

Discounts and Commissions; Expenses

The following table shows the public offering price, underwriting discount and proceeds, before expenses, to us. The information assumes either no exercise or full exercise by the Representative of the over-allotment option.

	Per Share (Common Stock)	Per Share (Preferred Stock)	Total Without Over-Allotment Option	Total With Full Over- Allotment Option
Public offering price	$	$	$	$
Underwriting discount (8%)	$	$	$	$
Proceeds, before expenses, to us	$	$	$	$

The underwriters propose to offer the shares offered by us to the public at the public offering price per share set forth on the cover of this prospectus. In addition, the underwriters may offer some of the shares to other securities dealers at such price less a concession of $ per share. After the initial offering, the public offering price and concession to dealers may be changed.

We have paid an expense deposit of $25,000 to the Representative, which will be applied against the accountable expenses that will be paid by us to the Representative in connection with this offering.

We have also agreed to reimburse the Representative for reasonable out-of-pocket legal and audit fees and expenses not to exceed $75,000 without our prior written consent. We estimate that total expenses payable by us in connection with this offering, other than the underwriting discount, will be approximately $.

Lock-Up Agreements

We and each of our executive officers and directors have agreed, subject to certain exceptions, not to offer, issue, sell, contract to sell, encumber, grant any option for the sale of or otherwise dispose of any shares of our common stock or other securities convertible into or exercisable or exchangeable for shares of our common stock for a period of 90 days after this offering is completed without the prior written consent of Maxim. The foregoing does not prohibit (a) the Company from granting options or equity awards to the Company's Directors and executive officers pursuant to equity compensation arrangements approved or subject to approval by the stockholders of the Company and (b) commencing 60 days after the offering is completed transactions under trading plans pursuant to SEC Rule 10b5-1.

Maxim may in its sole discretion and at any time without notice release some or all of the shares subject to lock-up agreements prior to the expiration of the lock-up period. When determining whether or not to release shares from the lock-up agreements, the Representative will consider, among other factors, the security holder's reasons for requesting the release, the number of shares for which the release is being requested and market conditions at the time.

Indemnification

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act, and to contribute to payments that the underwriters may be required to make for these liabilities.

Price Stabilization, Short Positions, and Penalty Bids

In connection with this offering, the underwriters may engage in transactions that stabilize, maintain or otherwise affect the price of our common stock. Specifically, the underwriters may over-allot in connection with this offering by selling more shares than are set forth on the cover page of this prospectus. This creates a short position in our common stock for its own account. The short position may be either a covered short position or a naked short position. In a covered short position, the number of shares common stock over-allotted by the underwriters is not greater than the number of shares of common stock that they may purchase in the over-allotment option. In a naked short position, the number of shares of common stock involved is greater than the number of shares common stock in the over-allotment option. To close out a short position, the underwriters may elect to exercise all or part of the over-allotment option. The underwriters may also elect to stabilize the price of our common stock or reduce any short position by bidding for, and purchasing, common stock in the open market.

The underwriters may also impose a penalty bid. This occurs when a particular underwriter or dealer repays selling concessions allowed to it for distributing a security in this offering because the underwriter repurchases that security in stabilizing or short covering transactions.

Finally, the underwriters may bid for, and purchase, shares of our common stock in market making transactions, including "passive" market making transactions as described below.

These activities may stabilize or maintain the market price of our common stock at a price that is higher than the price that might otherwise exist in the absence of these activities. The underwriters are not required to engage in these activities, and may discontinue any of these activities at any time without notice. These transactions may be effected on Nasdaq, in the over-the-counter market, or otherwise.

In connection with this offering, the underwriters and selling group members, if any, or their affiliates may engage in passive market making transactions in our common stock immediately prior to the commencement of sales in this offering, in accordance with Rule 103 of Regulation M under the Exchange Act. Rule 103 generally provides that:

- a passive market maker may not effect transactions or display bids for our common stock in excess of the highest independent bid price by persons who are not passive market makers;

- net purchases by a passive market maker on each day are generally limited to 30% of the passive market maker's average daily trading volume in our common stock during a specified two-month prior period or 200 shares, whichever is greater, and must be discontinued when that limit is reached; and
- passive market making bids must be identified as such.

Electronic Distribution

A prospectus in electronic format may be made available on a website maintained by the representatives of the underwriters and may also be made available on a website maintained by other underwriters. The underwriters may agree to allocate a number of shares to underwriters for sale to their online brokerage account holders. Internet distributions will be allocated by the representatives of the underwriters to underwriters that may make Internet distributions on the same basis as other allocations. In connection with the offering, the underwriters or syndicate members may distribute prospectuses electronically. No forms of electronic prospectus other than prospectuses that are printable as Adobe® PDF will be used in connection with this offering.

The underwriters have informed us that they do not expect to confirm sales of shares offered by this prospectus to accounts over which they exercise discretionary authority.

Other than the prospectus in electronic format, the information on any underwriter's website and any information contained in any other website maintained by an underwriter is not part of the prospectus or the registration statement of which this prospectus forms a part, has not been approved and/or endorsed by us or any underwriter in its capacity as underwriter and should not be relied upon by investors.

Certain Relationships

Maxim is acting as our sales agent in an "at-the-market" offering pursuant to a prospectus supplement filed by the Company with the SEC on September 25, 2020 (Registration No. 333-248555).

Certain of the underwriters and their affiliates may provide, from time to time, investment banking and financial advisory services to us in the ordinary course of business, for which they may receive customary fees and commissions.

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 shares 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 shares 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 shares or with respect to the eligibility of the shares 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 defenses 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.*

EXPERTS

The consolidated financial statements as of December 31, 2019 and 2018 and for each of the two years in the period ended December 31, 2019 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, 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. The underwriters are being represented by Ellenoff Grossman & Schole LLP, New York, New York.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

The Company files annual, quarterly and special reports, proxy statements and other information with the SEC. The SEC maintains an Internet site that contains all reports and other information that we file electronically with the SEC. The address of that website is *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.

We maintain a website at *www.atossatherapeutics.com*. Information contained in or accessible through our website does not constitute a part of this prospectus. We have included our website address in this prospectus solely as an inactive textual reference.

For further information with respect to us and the securities we are offering under this prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement (or incorporated by reference). Neither we nor the underwriter 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 shares 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. Our business, financial condition, results of operations and prospects may have changed since that date. We are not, and the underwriter is not, making an offer of these securities in any jurisdiction where such offer is not permitted. See "*About this Prospectus*."

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, 2019;
2. The Company's Quarterly Reports on Form 10-Q for the quarters ended March 31, 2020, June 30, 2020 and September 30, 2020;
3. The Company's Definitive Proxy Statement on Schedule 14A, filed with the SEC on April 13, 2020;
4. The Company's Current Reports on Form 8-K, filed with the SEC in 2020 on the following dates: January 7, February 10, April 13, May 19, and September 25;
5. 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, including any amendment or report filed for the purpose of updating that description; and
6. 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 Therapeutics, 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.atossatherapeutics.com*. The information on our website is not incorporated into this prospectus.

Up to Shares of Common Stock and
Up to Shares of Series C Convertible Preferred Stock

PROSPECTUS

Sole Book-Running Manager

Maxim Group LLC

, 2020

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	$	1,568.31
FINRA filing fee	$	*
Accountants Fees and Expenses	$	*
Legal Fees and Expenses	$	*
Miscellaneous	$	*
Total	$	*

* To be filed in a pre-effective amendment.

ITEM 14. Indemnification of Directors and Officers

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

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

- any breach of the director's duty of loyalty to us or our stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- any unlawful payments related to dividends or unlawful stock purchases, redemptions or other distributions; or
- any transaction from which the director derived an improper personal benefit.

These limitations of liability do not alter director liability under the federal securities laws and do not affect the availability of equitable remedies such as an injunction or rescission.

In addition, our bylaws provide that:

- we will indemnify our directors, officers and, in the discretion of our Board of Directors, certain employees to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended; and

- we will advance reasonable expenses, including attorneys' fees, to our directors and, in the discretion of our Board of Directors, to our officers and certain employees, in connection with legal proceedings relating to their service for or on behalf of us, subject to limited exceptions.

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

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

ITEM 16. Exhibit Index

		Incorporated by Reference Herein	
Exhibit No.	**Description**	**Form**	**Date**
3.1	Amended and Restated Certificate of Incorporation of Atossa Therapeutics, Inc.	Registration Statement on Form S-1, as Exhibit 3.2	June 11, 2012
3.2	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Atossa Therapeutics, Inc.	Current Report on Form 8-K, as Exhibit 4.1	August 26, 2016
3.3	Bylaws of Atossa Therapeutics, Inc.	Registration Statement on Form S-1, as Exhibit 3.4	June 11, 2012
3.4	Amendment to Bylaws of Atossa Therapeutics, Inc.	Current Report on Form 8-K, as Exhibit 3.1	December 20, 2012
3.5	Certificate of Designation, Preferences, and Rights of Series A Junior Participating Preferred Stock of Atossa Therapeutics, Inc.	Current Report on Form 8-K, as Exhibit 3.1	May 22, 2014
3.6	Certificate of Designation of Preference, Rights and Limitations of Series A Convertible Preferred Stock	Current Report on Form 10-Q, as Exhibit 3.1	May 11, 2017
3.7	Form of Certificate of Designation of Preference, Rights and Limitations of Series B Convertible Preferred Stock	Amendment No.1 to Registration Statement on Form S-1, as Exhibit 4.1	April 23, 2018
3.8**	Form of Certificate of Designations of Preference, Rights and Limitations of Series C Convertible Preferred Stock	**	**
3.9	Amended and Restated Certificate of Incorporation of Atossa Therapeutics, Inc.	Current Report on Form 8-K, as Exhibit 3.1	January 7, 2020
3.10	Amendment to Bylaws of Atossa Therapeutics, Inc.	Current Report on Form 8-K, as Exhibit 3.2	January 7, 2020
3.11	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Atossa Therapeutics, Inc.	Current Report on Form 8-K, as Exhibit 4.1	April 23, 2018
4.1	Specimen common stock certificate	Registration Statement on Form S-1, as Exhibit 4.1	May 21, 2012
4.2	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	Current Report of Form 8-K, as Exhibit 4.1	May 27, 2016
4.3	Form of Common Stock Purchase Warrant A	Current Report on Form 8-K, as Exhibit 4.1	December 22, 2017
4.4	Form of Common Stock Purchase Warrant B	Current Report on Form 8-K, as Exhibit 4.2	December 22, 2017
4.5	Form of Warrant Agreement	Amendment No.1 to Registration Statement on Form S-1, as Exhibit 4.2	April 23, 2018
4.6	Form of Warrant Certificate	Amendment No.1 to Registration Statement on Form S-1, as Exhibit 4.3	April 23, 2018
4.7	Description of Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934	Current Report on Form 10K, as Exhibit 4.16	March 26, 2020
4.8	Form of Senior Indenture	Registration Statement on Form S-3, as exhibit 4.1	September 2, 2020
5.1**	Opinion of Gibson, Dunn & Crutcher LLP	**	**

10.1#	Restated and Amended Employment Agreement with Steven Quay	Registration Statement on Form S-1, as Exhibit 10.3	February 14, 2012
10.2#	Form of Indemnification Agreement	Registration Statement on Form S-1, as Exhibit 10.5	May 21, 2012
10.3#	Form of 2019 Option Award Agreement	Current Report on Form 8-K, as Exhibit 4.1	January 13, 2019
10.4#	Form of Non-Qualified Stock Option Agreement for Employees	Registration Statement on Form S-1, as Exhibit 10.8	June 11, 2012
10.5#	Form of Non-Qualified Stock Option Agreement for Non-Employee Directors	Registration Statement on Form S-1, as Exhibit 10.9	June 11, 2012
10.6#	Form of Restricted Stock Award Agreement	Registration Statement on Form S-1, as Exhibit 10.13	June 11, 2012
10.7#	Amended and Restated Employment Agreement between the Company and Kyle Guse dated May 18, 2016	Current Report on Form 8-K, as Exhibit 10.1	May 20, 2016
10.8#	2010 Stock Option and Incentive Plan, as amended January 13, 2019	Current Report on Form 8-K, as Exhibit 4.2	January 15, 2019
10.9	Equity Distribution Agreement, dated as of September 25, 2020, by and between Atossa Therapeutics, Inc. and Maxim Group LLC	Current Report of Form 8-K, as Exhibit 1.1	September 25, 2020
10.10#	Form of 2020 ISO Option Award Agreement	Current Report on Form 10Q, as Exhibit 4.1	May 13, 2020
10.11#	Form of 2020 Option Award Agreement	Current Report on Form 8-K, as Exhibit 4.1	April 13, 2020
10.12#	Atossa Therapeutics, Inc. 2020 Stock Incentive Plan	On Form DEF 14A, as Appendix A	April 13, 2020
22.1	List of Subsidiaries	Current Report on Form 10K, as exhibit 22.1	March 26, 2020
23.1	Consent of BDO USA LLP	Filed herewith	
23.2**	Consent of Gibson, Dunn & Crutcher LLP (Included in Exhibit 5.1)	**	**
24.1	Powers of Attorney	Filed herewith on Powers of Attorney Page	

** To be filed by amendment
# Indicates management contract or compensatory plan, contract or agreement.
†† Schedules and exhibits omitted pursuant to Item 601 of Regulation S-K.

ITEM 17. Undertakings

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. 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 Securities Act and will be governed by the final adjudication of such issue.

The undersigned registrant hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance on Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be a part of this registration statement as of the time it was declared effective.

(2) For purposes of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus 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.

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 November 20, 2020.

Atossa Therapeutics, Inc.

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

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS that each individual whose signature appears below constitutes and appoints Steven C. Quay and Kyle Guse as his or her true and lawful attorney-in-fact and agent, with full power of substitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign this registration statement and any and all amendments thereto, including post-effective amendments, and to file the same, with all exhibits thereto, any related registration filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent, full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all the said attorney-in-fact and agent or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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)	November 20, 2020
/s/Kyle Guse **Kyle Guse**	Chief Financial Officer, General Counsel and Secretary (Principal Financial and Accounting Officer)	November 20, 2020
/s/Shu-Chih Chen **Shu-Chih Chen, Ph.D.**	Director	November 20, 2020
/s/Richard Steinhart **Richard Steinhart**	Director	November 20, 2020
/s/Stephen J. Galli **Stephen J. Galli, M.D.**	Director	November 20, 2020
/s/H. Lawrence Remmel **H. Lawrence Remmel**	Director	November 20, 2020
/s/Gregory L. Weaver **Gregory L. Weaver**	Director	November 20, 2020

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

Atossa Therapeutics, Inc.
Seattle, Washington

We hereby consent to the incorporation by reference in the Prospectus constituting a part of this Registration Statement on Form S-1 of our report dated March 26, 2020, relating to the consolidated financial statements of Atossa Therapeutics, Inc. (the "Company"), appearing in the Company's Annual Report on Form 10-K for the year ended December 31, 2019. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

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

/s/BDO USA, LLP
Seattle, Washington

November 20, 2020