

SECURITIES & EXCHANGE COMMISSION EDGAR FILING

ENDRA Life Sciences Inc.

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The information contained in this preliminary prospectus supplement and the accompanying prospectus is not complete and may be changed. This preliminary prospectus supplement and the accompanying prospectus are not an offer to sell these securities and are not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED OCTOBER 10, 2018

PROSPECTUS SUPPLEMENT
(To Prospectus dated September 4, 2018)



ENDRA Life Sciences Inc.

\$2,735,000 of Shares of Common Stock
\$ per Share

We are offering \$2,735,000 of shares of our common stock, par value \$0.0001 per share, pursuant to this prospectus supplement and the accompanying prospectus. Our common stock is traded on the Nasdaq Capital Market under the symbol "NDRA". On October 9, 2018, the last reported sale price of our common stock on the Nasdaq Capital Market was \$2.80 per share.

We are an "emerging growth company" as that term is used in the Jumpstart Our Business Startups Act of 2012 and, as such, have elected to comply with certain reduced public company reporting requirements for this prospectus and future filings. See "Prospectus Summary – Implications of Being an Emerging Growth Company."

Investing in our securities involves a high degree of risk. See "Risk Factors" beginning on page S-9 of this prospectus supplement, and under similar headings in the documents that are incorporated by reference into this prospectus supplement for a discussion of information that should be considered in connection with an investment in our securities.

	Per Share	Total
Public offering price	\$	
Underwriting discount (1)	\$	
Proceeds, before expenses, to us (2)	\$	

- (1) We have also granted warrants to the underwriter in connection with this offering and agreed to reimburse the underwriter for certain expenses incurred by them, including a 1% non-accountable expense allowance and reimbursement of up to \$50,000 in accountable expenses. See "Underwriting" for a description of the compensation payable by us to the underwriter.
- (2) We estimate the total expenses payable by us, excluding the underwriting discount, the 1% non-accountable expense allowance and up to \$50,000 in accountable expenses, will be approximately \$150,000.

We have granted the underwriter a 45-day option to purchase additional shares of common stock in an amount up to 15% of shares sold to the public in this offering to cover over-allotments, if any. If the underwriter exercises the option in full, the total underwriting discounts and commissions payable by us will be \$ and the total proceeds to us, before expenses, will be \$.

As of the date of this prospectus supplement, the aggregate market value of our outstanding common stock held by non-affiliates was \$9,812,448 based on 3,947,828 shares of outstanding common stock, of which 2,748,585 shares are held by non-affiliates, and the last reported sale price of our common stock of \$3.57 per share on September 24, 2018. Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell securities in a public primary offering with a value exceeding more than one-third of our public float in any 12-month period so long as our public float remains below \$75,000,000. Following the sale of shares in this offering, we have sold securities with an aggregate market value of \$ pursuant to General Instruction 1.B.6 of Form S-3 during the 12 calendar month period that ends on and includes the date hereof.

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

The underwriter expects to deliver the shares of common stock against payment on or about , 2018, subject to customary closing conditions.

National Securities Corporation

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ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying prospectus form part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or the "SEC," using a "shelf" registration process. This document contains two parts. The first part consists of this prospectus supplement, which provides you with specific information about this offering. The second part, the accompanying prospectus, provides more general information, some of which may not apply to this offering. Generally, when we refer only to the "prospectus," we are referring to both parts combined together with all documents incorporated by reference.

In this prospectus supplement, the terms "ENDRA," "we," "us," "our" and the "Company" refer to ENDRA Life Sciences Inc., a Delaware corporation, and its consolidated subsidiary. References to our "common stock" are to the common stock of ENDRA Life Sciences Inc.

This prospectus supplement, and the information incorporated herein by reference, may add, update or change information in the accompanying prospectus and in any free writing prospectuses we may provide to you in connection with this offering. You should read both this prospectus supplement and the accompanying prospectus together with additional information described under the headings "Where You Can Find More Information" and "Incorporation of Certain Information by Reference." If there is any inconsistency between the information in this prospectus supplement and the accompanying prospectus, you should rely on the information in this prospectus supplement.

You should rely only on the information contained in or incorporated by reference to this prospectus supplement and the accompanying prospectus. We have not, and the underwriter has not, authorized anyone to provide you with additional or different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not, and the underwriter is not, making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus supplement, the accompanying prospectus and in any free writing prospectus we may provide to you in connection with this offering is accurate only as of their respective dates, regardless of time of delivery. Our business, financial condition, results of operations and prospects may have changed since those dates.

MARKET AND INDUSTRY DATA

Unless otherwise indicated, information contained in this prospectus supplement, the accompanying prospectus and the documents we incorporate by reference concerning our industry and the markets in which we operate is based on information from independent industry and research organizations, other third-party sources (including industry publications, surveys and forecasts), and management estimates. Management estimates are derived from publicly available information released by independent industry analysts and third-party sources, as well as data from our internal research, and are based on assumptions made by us upon reviewing such data and our knowledge of such industry and markets which we believe to be reasonable. Although we believe the data from these third-party sources is reliable, we have not independently verified any third-party information. In addition, projections, assumptions and estimates of the future performance of the industry in which we operate and our future performance are necessarily subject to uncertainty and risk due to a variety of factors, including those described in "Risk Factors" and "Cautionary Note Regarding Forward-Looking Statements and Other Information Contained In This Prospectus." These and other factors could cause results to differ materially from those expressed in the estimates made by the independent parties and by us.

TRADEMARKS

We operate under a number of trademarks, including, among others, "ENDRA" and "TAEUS," all of which are registered under applicable intellectual property laws. This prospectus supplement and the accompanying prospectus contain references to our trademarks and service marks and to those belonging to other entities. Solely for convenience, trademarks and trade names referred to in this prospectus may appear without the ® or TM symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent possible under applicable law, our rights or the rights of the applicable licensor to these trademarks and trade names. We do not intend our use or display of other companies' trade names, trademarks or service marks to imply a relationship with, or endorsement or sponsorship of us by, any other companies.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Certain information set forth in this prospectus supplement and the accompanying prospectus or incorporated by reference herein or therein, may contain “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”), that are intended to be covered by the “safe harbor” created by those sections. Forward-looking statements, which are based on certain assumptions and describe our future plans, strategies and expectations, can generally be identified by the use of forward-looking terms such as “believe,” “expect,” “may,” “will,” “should,” “would,” “could,” “seek,” “intend,” “plan,” “goal,” “project,” “estimate,” “anticipate,” “strategy,” “future,” “likely” or other comparable terms and references to future periods. All statements other than statements of historical facts included in this prospectus regarding our strategies, prospects, financial condition, operations, costs, plans and objectives are forward-looking statements. Examples of forward-looking statements include, among others, statements we make regarding: expectations for revenues, cash flows and financial performance, the anticipated results of our development efforts and the timing for receipt of required regulatory approvals and product launches.

Forward-looking statements are neither historical facts nor assurances of future performance. Instead, they are based only on our current beliefs, expectations and assumptions regarding the future of our business, future plans and strategies, projections, anticipated events and trends, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict and many of which are outside of our control. Our actual results and financial condition may differ materially from those indicated in the forward-looking statements. Therefore, you should not rely on any of these forward-looking statements. Important factors that could cause our actual results and financial condition to differ materially from those indicated in the forward-looking statements include, among others, the following:

- our limited commercial experience, limited cash and history of losses;
- our ability to obtain adequate financing to fund our business operations in the future;
- our ability to achieve profitability;
- our ability to develop a commercially feasible application based on our TAEUS technology;
- market acceptance of our technology;
- results of our human studies, which may be negative or inconclusive;
- our ability to find and maintain development partners;
- our reliance on collaborations and strategic alliances and licensing arrangements;
- the amount and nature of competition in our industry;
- our ability to protect our intellectual property;
- potential changes in the healthcare industry or third-party reimbursement practices;

- delays and changes in regulatory requirements, policy and guidelines including potential delays in submitting required regulatory applications for CE mark certification or FDA approval;
- our ability to obtain CE mark certification and secure required FDA and other governmental approvals for our TAEUS applications;
- our ability to comply with regulation by various federal, state, local and foreign governmental agencies and to maintain necessary regulatory clearances or approvals; and
- the other risks and uncertainties described in the Risk Factors and in Management's Discussion and Analysis of Financial Condition and Results of Operations sections of this prospectus supplement and those risks and uncertainties described in the documents incorporated by reference into this prospectus supplement and the accompanying prospectus.

We urge you to consider those risks and uncertainties in evaluating our forward-looking statements. All subsequent written and oral forward-looking statements attributable to us or to persons acting on our behalf are expressly qualified in their entirety by the applicable cautionary statements. We further caution readers not to place undue reliance upon any such forward-looking statements, which speak only as of the date made. Except as otherwise required by the federal securities laws, we undertake no obligation to publicly update any forward-looking statement, whether written or oral, that may be made from time to time, whether as a result of new information, future developments or otherwise.

PROSPECTUS SUPPLEMENT SUMMARY

This summary highlights selected information contained elsewhere or incorporated by reference into this prospectus supplement and the accompanying prospectus and does not contain all of the information that you should consider before investing in our securities. You should carefully read the entire prospectus supplement and the accompanying prospectus before investing in our securities, including the information discussed under the "Risk Factors" as well as the financial statements and the other information incorporated by reference herein before making an investment decision.

Our Company

We are leveraging experience with pre-clinical enhanced ultrasound devices to develop technology for increasing the capabilities of clinical diagnostic ultrasound, to broaden patient access to the safe diagnosis and treatment of a number of significant medical conditions in circumstances where expensive X-ray computed tomography ("CT") and magnetic resonance imaging ("MRI") technology is unavailable or impractical.

In 2010, we began marketing and selling our Nexus 128 system, which combined light-based thermoacoustics and ultrasound to address the imaging needs of researchers studying disease models in pre-clinical applications. Building on this expertise in thermoacoustics, we have developed a next-generation technology platform — Thermo Acoustic Enhanced Ultrasound, or TAEUS — which is intended to enhance the capability of clinical ultrasound technology and support the diagnosis and treatment of a number of significant medical conditions that currently require the use of expensive CT or MRI imaging or where imaging is not practical using existing technology.

Unlike the near-infrared light pulses used in our legacy Nexus 128 system, our TAEUS technology uses radio frequency ("RF") pulses to stimulate tissues, using a small fraction of the energy that would be transmitted into the body during an MRI scan. The use of RF energy allows our TAEUS technology to penetrate deep into tissue, enabling the imaging of human anatomy at depths equivalent to those of conventional ultrasound. The RF pulses are absorbed by tissue and converted into ultrasound signals, which are detected by an external ultrasound receiver and a digital acquisition system that is part of the TAEUS system. The detected ultrasound is processed into images using our proprietary algorithms and displayed to complement conventional gray-scale ultrasound images.

Each of our TAEUS platform applications will require regulatory approvals before we are able to sell or license the application. Based on certain factors, such as the installed base of ultrasound systems, availability of other imaging technologies, such as CT and MRI, economic strength and applicable regulatory requirements, we intend to seek initial approval of our applications for sale in the European Union, followed by the United States and China.

In April 2016, we entered into a Collaborative Research Agreement with General Electric Company, acting through its GE Healthcare business unit and the GE Global Research Center (collectively, "GE Healthcare"). Under the terms of the agreement, GE Healthcare has agreed to assist us in our efforts to commercialize our TAEUS technology for use in a fatty liver application by, among other things, providing equipment and technical advice, and facilitating introductions to GE Healthcare clinical ultrasound customers. In return for this assistance, we have agreed to afford GE Healthcare certain rights of first offer with respect to manufacturing and licensing rights for the target application. More specifically, we have agreed that, prior to commercially releasing our non-alcoholic fatty liver disease ("NAFLD") TAEUS application, we will offer to negotiate an exclusive ultrasound manufacturer relationship with GE Healthcare for a period of at least one year of commercial sales. The commercial sales would involve, within our sole discretion, either our Company commercially selling GE Healthcare ultrasound systems as the exclusive ultrasound system with our TAEUS fatty liver application embedded, or GE Healthcare being the exclusive ultrasound manufacturer to sell ultrasound systems with our TAEUS fatty liver application embedded. The agreement is subject to termination by either party upon not less than 60 days' notice. On January 30, 2018, we and GE Healthcare entered into an amendment to our agreement, extending its term by 21 months to January 22, 2020.

In November 2017 we engaged two firms that specialize in medical device software development to commence productization of our TAEUS device targeting NAFLD. The agreements call for these vendors to provide us with the specialized engineering resources necessary to translate our current prototype TAEUS device into a clinical product meeting CE regulatory requirements required for commercial launch in the European Union followed by FDA submission for the U.S. market.

In November 2017, we also contracted the Centre for Imaging Technology Commercialization (CIMTEC) to initiate human studies with our TAEUS device, and anticipate results from these studies to be announced during the fourth quarter of 2018.

In June 2018, we reported that, in order to focus our resources on developing our TAEUS technology for clinical use, we are exploring strategic alternatives with respect to our pre-clinical business, including a potential sale.

Corporate Information

We were incorporated in Delaware in July 2007 and have a wholly-owned subsidiary, ENDRA Life Sciences Canada Inc. Our corporate headquarters is located at 3600 Green Court, Suite 350, Ann Arbor, Michigan 48105-1570. Our website can be accessed at www.endrainc.com. The telephone number of our principal executive office is (734) 335-0468. The information contained on, or that may be obtained from, our website is not, and shall not be deemed to be, a part of this prospectus.

THE OFFERING

The information below is only a summary of more detailed information included elsewhere in this prospectus supplement and the accompanying prospectus. This summary may not contain all the information that is important to you or that you should consider before making a decision to invest in our common stock. Please read this entire prospectus supplement and the accompanying prospectus, including the risk factors, carefully.

Common stock offered by us	976,786 shares of common stock (or 1,123,304 shares if the underwriter exercises its over-allotment option in full), based on an assumed public offering price of \$2.80 per share, which was the last reported sale price of our common stock on the Nasdaq Capital Market on October 9, 2018.
Public offering price	\$ per share.
Over-allotment option	We have granted the underwriter a 45-day option to purchase up to additional shares of common stock to cover over-allotments, if any.
Common stock outstanding prior to this offering	3,947,828 shares of common stock.
Common stock outstanding after this offering	Based on an assumed public offering price of \$2.80 per share, which was the last reported sale price of our common stock on the Nasdaq Capital Market on October 9, 2018, 4,924,614 shares (or 5,071,132 shares if the underwriter exercises its over-allotment option in full). (1)(2)
Use of proceeds	We intend to use the net proceeds from this offering for working capital and other general corporate purposes and, possibly, to repay amounts due on secured convertible promissory notes. See "Use of Proceeds" for additional information.
Risk factors	See the section entitled "Risk Factors" and other information included in this prospectus supplement, the accompanying prospectus and in the documents incorporated by reference into this prospectus supplement for a discussion of factors you should carefully consider before deciding to invest in our securities.
Market and trading symbol for our common stock	Our common stock is listed on the Nasdaq Capital Market under the symbol "NDRA."

(1) The number of shares of our common stock to be outstanding after this offering is based on 3,947,828 shares of common stock outstanding as of September 30, 2018 and excludes the following:

- 2,608,677 shares of common stock issuable upon the exercise of outstanding warrants, including those trading on the Nasdaq Capital Market under the symbol "NDRAW," at a weighted average exercise price of \$6.51 per share;
- Up to 509,425 shares of common stock issuable upon the exercise of outstanding convertible promissory notes;
- 987,911 shares of our common stock issuable upon the exercise of outstanding stock options issued pursuant to our 2016 Omnibus Incentive Plan, or our Incentive Plan, at a weighted average exercise price of \$5.60 per share;
- 357,163 shares of our common stock reserved for future issuance under our Incentive Plan; and
- shares of our common stock issuable upon exercise of the underwriter's warrants issued to the underwriter in the offering.

(2) Except as otherwise indicated herein, all information in this prospectus assumes no exercise of the underwriter's over-allotment option.

RISK FACTORS

An investment in our securities involves a high degree of risk. You should carefully consider the risk factors contained in our most recently filed periodic reports filed with the SEC, including our Annual Report on Form 10-K for the fiscal year ended December 31, 2017, which are incorporated by reference into this prospectus supplement. Before deciding to invest in our securities, you should carefully consider these risks, as well as other information we include or incorporate by reference in this prospectus supplement.

If any of the events described in these risk factors actually occurs, or if additional risks and uncertainties that are not presently known to us or that we currently deem immaterial later materialize, then our business, prospects, results of operations and financial condition could be materially adversely affected. In that event, the trading price of our securities could decline, and you may lose all or part of your investment in our securities. The risks discussed below include forward-looking statements, and our actual results may differ substantially from those discussed in these forward-looking statements. See "Cautionary Note Regarding Forward-Looking Statements and Other Information Contained in this Prospectus."

Risks Related to this Offering

Management will have broad discretion as to the use of proceeds from this offering and may not use them effectively.

Our management will have broad discretion as to the application of the net proceeds from this offering and our stockholders will not have the opportunity as part of their investment decisions to assess whether the net proceeds are being used appropriately. You may not agree with our decisions, and our use of the proceeds may not yield any return on your investment. Because of the number and variability of factors that will determine our use of the net proceeds from this offering, their ultimate use may vary substantially from their currently intended use. Our failure to apply the net proceeds of this offering effectively could compromise our ability to pursue our growth strategy and we might not be able to yield a significant return, if any, in our investment of these net proceeds. You will not have the opportunity to influence our decisions on how to use our net proceeds from this offering.

You will experience immediate and substantial dilution in the book value per share of the common stock you purchase.

Because the offering price per share of our common stock being offered may be higher than the book value per share of our common stock, you may suffer substantial dilution in the net tangible book value of the common stock you purchase in this offering. For a further description of the dilution that investors in this offering will experience, see "Dilution."

In addition, investors in this offering will be subject to increased dilution upon the exercise of outstanding stock options and warrants.

Future sales of common stock by stockholders may have an adverse effect on the then prevailing market price of our common stock.

Sales of a substantial number of shares of our common stock in the public market following this offering could cause the market price of our common stock to decline and could impair our ability to raise capital through the sale of additional equity securities. We cannot predict the effect that future sales of our common stock or other equity-related securities would have on the market price of our common stock.

We have not paid dividends in the past and have no immediate plans to pay dividends.

We plan to reinvest all of our earnings, to the extent we have earnings, in order to further develop our technology and potential products and to cover operating costs. We do not plan to pay any cash dividends with respect to our securities in the foreseeable future. We cannot assure you that we would, at any time, generate sufficient surplus cash that would be available for distribution to the holders of our common stock as a dividend. Therefore, you should not expect to receive cash dividends on the common stock we are offering.

USE OF PROCEEDS

Based on an assumed public offering price of \$2.80 per share, which was the last reported sale price of our common stock on the Nasdaq Capital Market on October 9, 2018, we estimate that we will receive net proceeds of approximately \$2.5 million from this offering, or approximately \$2.7 million if the underwriter exercises its over-allotment option in full, in each case after deducting the underwriting discount and estimated offering expenses payable by us.

We intend to use the net proceeds of this offering for working capital and other general corporate purposes and, possibly, to repay amounts due on secured convertible promissory notes. We have outstanding \$1,027,000 of senior secured convertible promissory notes with a maturity date of December 31, 2018. These notes are automatically convertible into shares of Common Stock upon (1) our sale of shares of Common Stock (or series of related sales) resulting in aggregate gross cash proceeds of at least \$7,000,000, which amount would include proceeds from the offering contemplated by this prospectus supplement, or (2) holders of not less than a majority of the aggregate principal amount of all notes then outstanding electing to convert all the notes. Although we anticipate all the notes will be converted prior to their maturity date, they may not be so converted and if for any reason they are not, we may use a portion of the net proceeds from this offering to repay amounts due thereon.

We have not yet determined the amount of net proceeds to be used specifically for any particular purposes or the timing of these expenditures. Accordingly, our management will have significant discretion and flexibility in applying the net proceeds from the sale of these securities, and investors will be relying on our judgment regarding the application of the net proceeds from this offering.

Pending our use of the net proceeds from this offering, we intend to maintain the net proceeds as cash deposits or cash management instruments, such as U.S. government securities or money market mutual funds.

DILUTION

If you purchase shares of common stock in this offering, you will experience dilution to the extent of the difference between the public offering price per share in this offering and our pro forma net tangible book value per share immediately after this offering.

Net tangible book value per share represents total tangible assets less total liabilities, divided by the number of shares of common stock outstanding. Our historical net tangible book value as of June 30, 2018 was \$1,940,703, or \$0.49 per share of common stock. After giving effect to the sale of shares of common stock in this offering at an assumed public offering price of \$2.80 per share, which was the last reported sale price of our common stock on the Nasdaq Capital Market on October 9, 2018, and after deducting the underwriting discount and estimated offering expenses payable by us, our net tangible book value as of June 30, 2018 would have been \$4,306,903, or \$0.87 per share. This represents an immediate increase in net tangible book value of \$0.38 per share to existing stockholders and an immediate dilution in net tangible book value of \$1.93 per share to investors in this offering. The following table illustrates this dilution on a per share basis:

Assumed public offering price per share		\$	2.80
Historical net tangible book value per share as of June 30, 2018	\$	0.49	
Increase in net tangible book value per share attributable to this offering	\$	0.38	
As adjusted tangible book value per share, after giving effect to this offering			0.87
Dilution per share to investors in this offering		\$	1.93

If the underwriter exercises in full its option to purchase additional shares of common stock, the net tangible book value per share after giving effect to this offering would be \$0.93 per share, which amount represents an immediate increase in net tangible book value of \$0.43 per share of our common stock to existing stockholders and an immediate dilution in net tangible book value of \$1.88 per share of our common stock to investors purchasing shares in this offering.

The above discussion and tables are based on 3,923,027 shares of common stock outstanding as of June 30, 2018 and excludes the following:

- 2,608,677 shares of common stock issuable upon the exercise of outstanding warrants, at a weighted average exercise price of \$6.51 per share;
- Up 534,226 shares of common stock issuable upon the exercise of outstanding convertible promissory notes;
- 987,911 shares of our common stock issuable upon the exercise of outstanding stock options issued pursuant to our 2016 Omnibus Incentive Plan, or our Incentive Plan, at a weighted average exercise price of \$5.60 per share;
- 357,163 shares of our common stock reserved for future issuance under our Incentive Plan; and
- shares of our common stock issuable upon exercise of the underwriter's warrants issued to the underwriter in this offering.

To the extent that any of these options or warrants are exercised, new options are issued under our Incentive Plan or we issue additional shares of common stock or other equity securities in the future, there may be further dilution to investors participating in this offering.

UNDERWRITING

We have entered into an underwriting agreement with National Securities Corporation, referred to as the underwriter, with respect to the shares of common stock subject to this offering. Subject to certain conditions, we have agreed to sell to the underwriter, and the underwriter has agreed to purchase, the shares of common stock offered under this prospectus supplement.

The underwriter is offering the shares of common stock subject to their acceptance of the shares from us and subject to prior sale. The underwriting agreement provides that the obligations of the underwriter to pay for and accept delivery of the shares of common stock offered by this prospectus are subject to the approval of certain legal matters by their counsel and to certain other conditions. The underwriter is obligated to take and pay for all of the shares of common stock if any shares are taken. However, the underwriter is not required to take or pay for the shares of common stock covered by the underwriter's over-allotment option described below.

Over-Allotment Option

We have granted the underwriter an option, exercisable for 45 days from the date of this prospectus, to purchase up to an additional _____ shares of common stock to cover over-allotments, if any, of the common stock offered by this prospectus. If the underwriter exercises this option, the underwriter will be obligated, subject to certain conditions, to purchase the number of additional shares of common stock for which the option has been exercised.

Discount, Commissions and Expenses

The underwriter has advised us that they propose to offer the common stock to the public at the offering price set forth on the cover page of this prospectus and to certain dealers at that price less a concession not in excess of \$ _____ per share. The underwriter may allow, and certain dealers may reallocate, a discount from the concession not in excess of \$ _____ per share to certain brokers and dealers. After this offering, the public offering price, concession and reallocation to dealers may be changed by the underwriter. No such change shall change the amount of proceeds to be received by us as set forth on the cover page of this prospectus. The shares of common stock are offered by the underwriter as stated herein, subject to receipt and acceptance by them and subject to their right to reject any order in whole or in part. The underwriter has informed us that they do not intend to confirm sales to any accounts over which they exercise discretionary authority.

The following table shows the underwriting discount payable to the underwriter by us in connection with this offering. Such amounts are shown assuming both no exercise and full exercise of the underwriter's over-allotment option to purchase additional shares of common stock.

	Per Share(1)	Total Without Exercise of Over- Allotment Option	Total With Exercise of Over- Allotment Option
Public offering price	\$ -	\$ -	\$ -
Underwriting discounts and commissions	\$	\$	\$
Proceeds, before expenses, to us	\$	\$	\$

(1) Does not include the warrants to purchase shares of common stock equal to 3% of the number of shares sold in the offering to be issued to the underwriter at the closing of the offering.

We have agreed to pay the underwriter a non-accountable expense allowance equal to 1.0% of the public offering price of common stock sold in this offering and reimburse the underwriter up to \$50,000 on an accountable basis. We estimate that expenses payable by us in connection with this offering, other than the underwriting discount and non-accountable expense allowance referred to above but including the reimbursement of the underwriter's expenses \$150,000.

Indemnification

We have agreed to indemnify the underwriter against certain liabilities, including liabilities under the Securities Act of 1933, as amended, or the Securities Act, or to contribute to payments that the underwriter may be required to make in respect of those liabilities.

Lock-up Agreements

We, our officers, directors and our largest stockholder have agreed, subject to limited exceptions (including our largest shareholder's being permitted to sell a limited amount of shares during the lock-up period), for a period of 180 days after the date of the final prospectus supplement relating to this offering, with respect to our officers and directors, and 45 days after the date of the final prospectus supplement relating to this offering, with respect to our largest stockholder, not to offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend, or otherwise transfer or dispose of, directly or indirectly, any shares of capital stock or any securities convertible into or exchangeable for our capital stock either owned as of the date of the underwriting agreement or thereafter acquired, without the prior written consent of the underwriter. The underwriter may, in its sole discretion and at any time or from time to time before the termination of the lock-up period release all or any portion of the securities subject to lock-up agreements.

Price Stabilization, Short Positions and Penalty Bids

In connection with the offering the underwriter may engage in stabilizing transactions, over-allotment transactions, syndicate covering transactions and penalty bids in accordance with Regulation M under the Exchange Act.

Stabilizing transactions permit bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum.

Over-allotment involves sales by the underwriter of securities in excess of the number of securities the underwriter is obligated to purchase, which creates a syndicate short position. The short position may be either a covered short position or a naked short position. In a covered short position, the number of securities over-allotted by the underwriter is not greater than the number of securities that they may purchase in the over-allotment option. In a naked short position, the number of securities involved is greater than the number of securities in the over-allotment option. The underwriter may close out any covered short position by either exercising their over-allotment option and/or purchasing securities in the open market.

Syndicate covering transactions involve purchases of securities in the open market after the distribution has been completed in order to cover syndicate short positions. In determining the source of securities to close out the short position, the underwriter will consider, among other things, the price of securities available for purchase in the open market as compared to the price at which it may purchase securities through the over-allotment option. If the underwriter sells more securities than could be covered by the over-allotment option, a naked short position, the position can only be closed out by buying securities in the open market. A naked short position is more likely to be created if the underwriter is concerned that there could be downward pressure on the price of the securities in the open market after pricing that could adversely affect investors who purchase in the offering.

Penalty bids permit the underwriter to reclaim a selling concession from a syndicate member when the securities originally sold by the syndicate member are purchased in a stabilizing or syndicate covering transaction to cover syndicate short positions.

These stabilizing transactions, syndicate covering transactions and penalty bids may have the effect of raising or maintaining the market price of our securities or preventing or retarding a decline in the market price of the securities. As a result, the price of our securities may be higher than the price that might otherwise exist in the open market. Neither we nor the underwriter make any representation or prediction as to the direction or magnitude of any effect that the transactions described above may have on the price of the securities. In addition, neither we nor the underwriter make any representations that the underwriter will engage in these stabilizing transactions or that any transaction, once commenced, will not be discontinued without notice.

Electronic Distribution

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

Other

From time to time, the underwriter and/or its affiliates have provided, and may in the future provide, various investment banking and other financial services for us for which services they have received and, may in the future receive, customary fees. In the course of their businesses, the underwriter and its affiliates may actively trade our securities or loan for their own account or for the accounts of customers, and, accordingly, the underwriter and its affiliates may at any time hold long or short positions in such securities or loans.

LEGAL MATTERS

K&L Gates LLP, Charlotte, North Carolina, will pass upon certain legal matters relating to this offering. Golenbock Eiseman Assor Bell & Peskoe, LLP, New York, New York, is counsel for the underwriter in connection with certain legal matters related to this offering.

EXPERTS

The financial statements of ENDRA Life Sciences Inc. as of December 31, 2017 and December 31, 2016 and for each of the years in the two-year period ended December 31, 2017 included in our Annual Report on Form 10-K for the year ended December 31, 2017, which is incorporated by reference into this prospectus supplement, have been so incorporated in reliance on the report of RBSM LLP, an independent registered public accounting firm, incorporated herein by reference, given on the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC under the Exchange Act. We also filed with the SEC a registration statement on Form S-3, including exhibits, under the Securities Act with respect to the securities offered by this prospectus supplement. This prospectus supplement and the accompanying prospectus are a part of the registration statement but do not contain all the information contained in the registration statement or the exhibits to the registration statement. You can read our SEC filings, including the registration statement, at the SEC's website at www.sec.gov. You may read and copy this information at the SEC's Public Reference Room at 100 F Street, N.E., Washington D.C. 20549, at prescribed rates. You may obtain information regarding the operation of the public reference room by calling the SEC at 1-800-SEC-0330. Our website can be accessed at www.endrainc.com. The information contained on, or that may be obtained from, our website is not, and shall not be deemed to be, a part of this prospectus.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" information from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be a part of this prospectus supplement and the accompanying prospectus. We incorporate by reference the documents and reports listed below:

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 filed with the SEC on March 20, 2018 (as amended by Form 10-K/A filed with the SEC on April 13, 2018);
- our Quarterly Reports on Form 10-Q for the quarter ended March 31, 2018, filed with the SEC on May 15, 2018 and for the quarter ended June 30, 2018 filed with the SEC on August 13, 2018;
- our Current Reports on Form 8-K filed with the SEC on February 5, 2018, March 29, 2018 (as amended by Form 8-K/A filed on April 13, 2018), June 15, 2018, July 2, 2018; and August 17, 2018;
- our Definitive Proxy Statement on Schedule 14A related to our 2018 Annual Meeting of Stockholders, filed with the SEC on May 10, 2018; and
- The description of the Company's Common Stock contained in the Company's Registration Statement on Form 8-A (File No. 001-37969) filed with the SEC on December 16, 2016 pursuant to Section 12(g) of the Exchange Act on December 26, 2000, including any amendment or reports filed for the purpose of updating such description.

We also incorporate by reference any future filings (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items unless such Form 8-K expressly provides to the contrary) made with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made on or after the date of this prospectus supplement, until the termination of this offering. Information in such future filings updates and supplements the information provided in this prospectus supplement. Any statements in any such future filings will automatically be deemed to modify and supersede any information in any document we previously filed with the SEC that is incorporated or deemed to be incorporated herein by reference to the extent that statements in the later filed document modify or replace such earlier statements.

We will furnish without charge to you, on written or oral request, a copy of any or all of the documents incorporated by reference, including exhibits to these documents. You should direct any requests for documents to ENDRA Life Sciences Inc., 3600 Green Court, Suite 350, Ann Arbor, Michigan 48105; Telephone: (734) 335-0468. Copies of the above reports may also be accessed from our web site at www.endrainc.com. We are not incorporating the information on our website other than these filings into this prospectus supplement or the accompanying prospectus.

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or the SEC, utilizing a “shelf” registration process. Under this shelf process, we may from time to time sell any combination of securities described in this prospectus in one or more offerings.

This prospectus provides you with a general description of the securities we may offer. Each time we sell securities under this shelf registration process, we will provide a prospectus supplement that will contain specific information about the terms of the securities being offered. That prospectus supplement may include a discussion of any risk factors or other special consideration that apply to those securities. The prospectus supplement may also add, update or change information contained in this prospectus. If there is any inconsistency between the information in this prospectus and a prospectus supplement, you should rely on the information in that prospectus supplement. You should read both this prospectus and any applicable prospectus supplement together with additional information described below under the headings “Where You Can Find More Information” and “Incorporation by Reference.”

When acquiring any securities discussed in this prospectus, you should rely on the information provided in this prospectus and the prospectus supplement, including the information incorporated by reference. Neither we, nor any underwriters or agents, have authorized anyone to provide you with different information. We are not offering the securities in any state where such an offer is prohibited. You should not assume that the information in this prospectus, any prospectus supplement, or any document incorporated by reference, is truthful or complete at any date other than the date mentioned on the cover page of those documents. You should also carefully review the section entitled “Risk Factors”, which highlights certain risks associated with an investment in our securities, to determine whether an investment in our securities is appropriate for you.

Unless otherwise stated or the context requires otherwise, references to “ENDRA”, the “Company”, “we”, “us” or “our” are to ENDRA Life Sciences Inc.

FORWARD-LOOKING STATEMENTS

Certain information set forth in this prospectus or incorporated by reference in this prospectus may contain 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 Exchange Act, that are intended to be covered by the “safe harbor” created by those sections. Forward-looking statements, which are based on certain assumptions and describe our future plans, strategies and expectations, can generally be identified by the use of forward-looking terms such as “believe,” “expect,” “may,” “will,” “should,” “would,” “could,” “seek,” “intend,” “plan,” “estimate,” “goal,” “anticipate,” “project” or other comparable terms. All statements other than statements of historical facts included in this prospectus regarding our strategies, prospects, financial condition, operations, costs, plans and objectives are forward-looking statements. Examples of forward-looking statements include, among others, statements we make regarding: expectations for revenues, cash flows and financial performance, the anticipated results of our development efforts and the timing for receipt of required regulatory approvals and product launches.

Forward-looking statements are neither historical facts nor assurances of future performance. Instead, they are based only on our current beliefs, expectations and assumptions regarding the future of our business, future plans and strategies, projections, anticipated events and trends, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict and many of which are outside our control. Our actual results and financial condition may differ materially from those in the forward-looking statements. Therefore, you should not rely on any of these forward-looking statements. Important factors that could cause our actual results and financial condition to differ materially from those indicated in the forward-looking statements include, among others, the following:

- our limited commercial experience, limited cash and history of losses;
- our ability to obtain adequate financing to fund our business operations in the future;

- our ability to achieve profitability;
- our ability to develop a commercially feasible application based on our TAEUS technology;
- market acceptance of our technology;
- results of our human studies, which may be negative or inconclusive;
- our ability to find and maintain development partners;
- our reliance on collaborations and strategic alliances and licensing arrangements;
- the amount and nature of competition in our industry;
- our ability to protect our intellectual property;
- potential changes in the healthcare industry or third-party reimbursement practices;
- delays and changes in regulatory requirements, policy and guidelines including potential delays in submitting required regulatory applications for CE mark certification or FDA approval;
- our ability to obtain CE mark certification and secure required FDA and other governmental approvals for our TAEUS applications;
- our ability to comply with regulation by various federal, state, local and foreign governmental agencies and to maintain necessary regulatory clearances or approvals; and
- the other risks and uncertainties described in the Risk Factors and in Management's Discussion and Analysis of Financial Condition and Results of Operations sections of this prospectus.

We urge you to consider those risks and uncertainties in evaluating our forward-looking statements. All subsequent written and oral forward-looking statements attributable to us or to persons acting on our behalf are expressly qualified in their entirety by the applicable cautionary statements. We further caution readers not to place undue reliance upon any such forward-looking statements, which speak only as of the date made. Except as otherwise required by the federal securities laws, we undertake no obligation to publicly update any forward-looking statement, whether written or oral, that may be made from time to time, whether as a result of new information, future developments or otherwise.

THE COMPANY

We are leveraging experience with pre-clinical enhanced ultrasound devices to develop technology for increasing the capabilities of clinical diagnostic ultrasound, to broaden patient access to the safe diagnosis and treatment of a number of significant medical conditions in circumstances where expensive X-ray computed tomography ("CT") and magnetic resonance imaging ("MRI") technology is unavailable or impractical.

In 2010, we began marketing and selling our Nexus 128 system, which combined light-based thermoacoustics and ultrasound to address the imaging needs of researchers studying disease models in pre-clinical applications. Building on this expertise in thermoacoustics, we have developed a next-generation technology platform — Thermo Acoustic Enhanced Ultrasound, or TAEUS — which is intended to enhance the capability of clinical ultrasound technology and support the diagnosis and treatment of a number of significant medical conditions that currently require the use of expensive CT or MRI imaging or where imaging is not practical using existing technology.

Implications of Being an Emerging Growth Company

We are an “emerging growth company,” as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, and, for as long as we continue to be an “emerging growth company,” we may choose to take advantage of exemptions from various reporting requirements applicable to other public companies but not to “emerging growth companies,” including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. We could be an “emerging growth company” until December 31, 2022, or until the earliest of (i) the last day of the first fiscal year in which our annual gross revenues exceed \$1.07 billion, (ii) the date that we become a “large accelerated filer” as defined in Rule 12b-2 under the Securities Exchange Act of 1934, as amended, which would occur if the market value of our common stock that is held by non-affiliates exceeds \$700 million as of the last business day of our most recently completed second fiscal quarter, or (iii) the date on which we have issued more than \$1 billion in non-convertible debt during the preceding three-year period. We are choosing to “opt out” of the extended transition periods available under the JOBS Act for complying with new or revised accounting standards, but intend to take advantage of the other exemptions discussed above.

We are also currently considered a “smaller reporting company,” which generally means that we have a public float of less than \$75 million. If we are still considered a “smaller reporting company” at such time as we cease to be an “emerging growth company,” we will be subject to increased disclosure requirements. However, the disclosure requirements will still be less than they would be if we were not considered either an “emerging growth company” or a “smaller reporting company.” Specifically, similar to “emerging growth companies,” “smaller reporting companies” are able to provide simplified executive compensation disclosures in their filings; are exempt from the provisions of Section 404(b) of the Sarbanes-Oxley Act requiring that independent registered public accounting firms provide an attestation report on the effectiveness of internal control over financial reporting; and have certain other decreased disclosure obligations in their SEC filings, including, among other things, being required to provide only two years of audited financial statements in annual reports.

Corporate Information

We were incorporated in Delaware in July 2007 and have a wholly-owned subsidiary, ENDRA Life Sciences Canada Inc. Our corporate headquarters is located at 3600 Green Court, Suite 350, Ann Arbor, Michigan 48105-1570. Our website can be accessed at www.endrainc.com. The telephone number of our principal executive office is (734) 335-0468. The information contained on, or that may be obtained from, our website is not, and shall not be deemed to be, a part of this prospectus.

RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully consider the risk factors described in our Annual Report on Form 10-K for our most recent fiscal year (together with any material changes thereto contained in subsequently filed Quarterly Reports on Form 10-Q) and those contained in our other filings with the SEC, which are incorporated by reference in this prospectus and any accompanying prospectus supplement.

The prospectus supplement applicable to each type or series of securities we offer may contain a discussion of risks applicable to the particular types of securities that we are offering under that prospectus supplement. Prior to making a decision about investing in our securities, you should carefully consider the specific factors discussed under the caption “Risk Factors” in the applicable prospectus supplement, together with all of the other information contained in the prospectus supplement or appearing or incorporated by reference in this prospectus. These risks could materially affect our business, results of operations or financial condition and cause the value of our securities to decline. You could lose all or part of your investment.

USE OF PROCEEDS

We currently intend to use the estimated net proceeds from the sale of these securities for working capital and general corporate purposes, including to fund our product development efforts and to fund our commercialization activities for our TAEUS technology. Accordingly, our management will have significant discretion and flexibility in applying the net proceeds from the sale of these securities. Our plans to use the estimated net proceeds from the sale of these securities may change, and if they do, we will update this information in a prospectus supplement.

DESCRIPTION OF SECURITIES WE MAY OFFER

We may issue from time to time, in one or more offerings, the following securities:

- shares of common stock;
- shares of preferred stock;
- debt securities, which may include senior debt securities, subordinated debt securities and senior subordinated debt securities; and
- warrants for the purchase of debt securities, preferred stock or common stock.

Set forth below is a description of the common stock and preferred stock that may be offered under this prospectus. We will set forth in the applicable prospectus supplement and/or free writing prospectus a description of the debt securities and warrants that may be offered under this prospectus. The terms of the offering of our common stock, preferred stock or any such other securities, the initial offering price and the net proceeds to us will be contained in the prospectus supplement, and other offering material, relating to such offer.

We may sell the securities being offered pursuant to this prospectus directly to purchasers, to or through underwriters, through dealers or agents, or through a combination of such methods. The prospectus supplement with respect to the securities being offered will set forth the terms of the offering of those securities, including the names of any such underwriters, dealers or agents, the purchase price, the net proceeds to us, any underwriting discounts and other items constituting underwriters' compensation, the initial public offering price, any discounts or concessions allowed or reallocated or paid to dealers and any securities exchanges on which such securities may be listed.

DESCRIPTION OF COMMON STOCK WE MAY OFFER

The following summary description of our common stock is based on the provisions of our certificate of incorporation and bylaws, and the applicable provisions of the General Corporation Law of the State of Delaware. This information may not be complete in all respects and is qualified entirely by reference to the provisions of our Fourth Amended and Restated Certificate of Incorporation (the "Certificate of Incorporation"), and our amended and restated bylaws (the "Bylaws") and the General Corporation Law of the State of Delaware. For information on how to obtain copies of our Certificate of Incorporation and Bylaws, see the discussion below under the heading "Where You Can Find More Information."

We may offer our common stock issuable upon the conversion of debt securities or preferred stock and upon the exercise of warrants.

Authorized Capital

We currently have authority to issue 50,000,000 shares of our common stock, par value of \$0.0001 per share. As of August 13, 2018, 3,923,027 shares of our common stock were issued and outstanding, held of record by 45 stockholders. Our authorized but unissued shares of common stock are available for issuance without further action by our stockholders, unless such action is required by applicable law or the rules of any stock exchange or automated quotation system on which our securities may be listed or traded.

Voting Rights

Each holder of our common stock is entitled to one vote for each such share outstanding in the holder's name. No holder of common stock is entitled to cumulate votes in voting for directors.

Dividend and Liquidation Rights

The holders of outstanding shares of our common stock are entitled to such dividends as may be declared by our board of directors out of funds legally available for such purpose. The shares of our common stock are neither redeemable nor convertible. Holders of our common stock have no preemptive or subscription rights to purchase any of our securities. In the event of our liquidation, dissolution or winding up, the holders of our common stock are entitled to receive pro rata our assets, which are legally available for distribution, after payments of all debts and other liabilities. All of the outstanding shares of our common stock are fully paid and non-assessable.

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

Our shares of common stock are listed on the Nasdaq Capital Market under the symbol "NDRA."

DESCRIPTION OF PREFERRED STOCK WE MAY OFFER

This section describes the general terms and provisions of the preferred stock we may offer. This information may not be complete in all respects and is qualified entirely by reference to our Certificate of Incorporation, with respect to each series of preferred stock. The specific terms of any series will be described in a prospectus supplement. Those terms may differ from the terms discussed below. Any series of preferred stock we issue will be governed by our Certificate of Incorporation and by the certificate of designations relating to that series. We will file the certificate of designations with the SEC and incorporate it by reference as an exhibit to our registration statement at or before the time we issue any preferred stock of that series.

Authorized Preferred Stock

Our Certificate of Incorporation authorizes us to issue 10,000,000 shares of preferred stock, par value \$0.0001 per share. As of August 13, 2018, we had no shares of preferred stock issued and outstanding. Our authorized but unissued shares of preferred stock are available for issuance without further action by our stockholders, unless such action is required by applicable law or the rules of any stock exchange or automated quotation system on which our securities may be listed or traded.

Our board of directors has the authority to issue preferred stock in one or more series and to fix the designations, powers, rights, preferences, qualifications, limitations and restrictions thereof. These designations, powers, rights and preferences could include voting rights, dividend rights, dissolution rights, conversion rights, exchange rights, redemption rights, liquidation preferences, and the number of shares constituting any series or the designation of such series, any or all of which may be greater than the rights of common stock. The issuance of preferred stock could adversely affect the voting power of holders of common stock and the likelihood that such holders will receive dividend payments and payments upon liquidation. In addition, the issuance of preferred stock could have the effect of delaying, deferring or preventing change in our control or other corporate action. No shares of our preferred stock are currently issued and outstanding.

Specific Terms of a Series of Preferred Stock

The preferred stock we may offer will be issued in one or more series. A prospectus supplement will discuss the following features of the series of preferred stock to which it relates:

- the designations and stated value per share;

- the number of shares offered;
- the amount of liquidation preference per share;
- the public offering price at which the preferred stock will be issued;
- the dividend rate, the method of its calculation, the dates on which dividends would be paid and the dates, if any, from which dividends would cumulate;
- any redemption or sinking fund provisions;
- any conversion or exchange rights; and
- any additional voting, dividend, liquidation, redemption, sinking fund and other rights, preferences, privileges, limitations and restrictions.

PLAN OF DISTRIBUTION

We may sell the securities offered by this prospectus to one or more underwriters or dealers for public offering, through agents, directly to purchasers or through a combination of any such methods of sale. The name of any such underwriters, dealers or agents involved in the offer and sale of the securities, the amounts underwritten and the nature of its obligation to take the securities will be specified in the applicable prospectus supplement. We have reserved the right to sell the securities directly to investors on our own behalf in those jurisdictions where we are authorized to do so. The sale of the securities may be effected in transactions (a) on any national or international securities exchange or quotation service on which the securities may be listed or quoted at the time of sale, (b) in the over-the-counter market, (c) in transactions otherwise than on such exchanges or in the over-the-counter market or (d) through the writing of options.

We and our agents and underwriters may offer and sell the securities at a fixed price or prices that may be changed, at market prices prevailing at the time of sale, at prices related to such prevailing market prices or at negotiated prices. The securities may be offered on an exchange, which will be disclosed in the applicable prospectus supplement. We may, from time to time, authorize dealers, acting as our agents, to offer and sell the securities upon such terms and conditions as set forth in the applicable prospectus supplement.

If we use underwriters to sell securities, we will enter into an underwriting agreement with them at the time of the sale to them. In connection with the sale of the securities, underwriters may receive compensation from us in the form of underwriting discounts or commissions and may also receive commissions from purchasers of the securities for whom they may act as agent. Any underwriting compensation paid by us to underwriters or agents in connection with the offering of the securities, and any discounts, concessions or commissions allowed by underwriters to participating dealers, will be set forth in the applicable prospectus supplement to the extent required by applicable law. Underwriters may sell the securities to or through dealers, and such dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters or commissions (which may be changed from time to time) from the purchasers for whom they may act as agents.

Dealers and agents participating in the distribution of the securities may be deemed to be underwriters, and any discounts and commissions received by them and any profit realized by them on resale of the securities may be deemed to be underwriting discounts and commissions under the Securities Act. Unless otherwise indicated in the applicable prospectus supplement, an agent will be acting on a best efforts basis and a dealer will purchase debt securities as a principal, and may then resell the debt securities at varying prices to be determined by the dealer.

If so indicated in the prospectus supplement, we will authorize underwriters, dealers or agents to solicit offers by certain specified institutions to purchase offered securities from us at the public offering price set forth in the prospectus supplement pursuant to delayed delivery contracts providing for payment and delivery on a specified date in the future. Such contracts will be subject to any conditions set forth in the applicable prospectus supplement and the prospectus supplement will set forth the commission payable for solicitation of such contracts. The underwriters and other persons soliciting such contracts will have no responsibility for the validity or performance of any such contracts.

Underwriters, dealers and agents may be entitled, under agreements entered into with us, to indemnification against and contribution towards certain civil liabilities, including any liabilities under the Securities Act.

To facilitate the offering of securities, certain persons participating in the offering may engage in transactions that stabilize, maintain, or otherwise affect the price of the securities. These may include over-allotment, stabilization, syndicate short covering transactions and penalty bids. Over-allotment involves sales in excess of the offering size, which creates a short position. Stabilizing transactions involve bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum. Syndicate short covering transactions involve purchases of securities in the open market after the distribution has been completed in order to cover syndicate short positions. Penalty bids permit the underwriters to reclaim selling concessions from dealers when the securities originally sold by the dealers are purchased in covering transactions to cover syndicate short positions. These transactions may cause the price of the securities sold in an offering to be higher than it would otherwise be. These transactions, if commenced, may be discontinued by the underwriters at any time.

Any securities other than our common stock issued hereunder may be new issues of securities with no established trading market. Any underwriters or agents to or through whom such securities are sold for public offering and sale may make a market in such securities, but such underwriters or agents will not be obligated to do so and may discontinue any market making at any time without notice. No assurance can be given as to the liquidity of the trading market for any such securities. The amount of expenses expected to be incurred by us in connection with any issuance of securities will be set forth in the applicable prospectus supplement. Certain of the underwriters, dealers or agents and their associates may engage in transactions with, and perform services for, us and certain of our affiliates in the ordinary course of business.

During such time as we may be engaged in a distribution of the securities covered by this prospectus we are required to comply with Regulation M promulgated under the Exchange Act. With certain exceptions, Regulation M precludes us, any affiliated purchasers, and any broker-dealer or other person who participates in such distribution from bidding for or purchasing, or attempting to induce any person to bid for or purchase, any security which is the subject of the distribution until the entire distribution is complete. Regulation M also restricts bids or purchases made in order to stabilize the price of a security in connection with the distribution of that security. All of the foregoing may affect the marketability of our shares of common stock.

LEGAL MATTERS

The validity and legality of the securities offered hereby and certain other legal matters will be passed upon for the Company by K&L Gates LLP, Charlotte, North Carolina.

EXPERTS

RBSM LLP, independent registered public accounting firm, has audited our financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2017, which is incorporated by reference into this prospectus and the registration statement of which this prospectus is a part. Our financial statements are incorporated by reference in reliance on RBSM LLP's report, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and special reports, proxy statements and other information with the SEC. You can inspect and copy these reports, proxy statements and other information 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 SEC also maintains a web site that contains reports, proxy and information statements and other information regarding issuers, such as ENDRA Life Sciences Inc. (www.sec.gov). Our web site is located at www.endrainc.com. The information contained on, or that may be obtained from, our website is not, and shall not be deemed to be, a part of this prospectus.

We will provide, upon written or oral request, without charge to you, including any beneficial owner to whom this prospectus is delivered, a copy of any or all of the documents incorporated herein by reference other than the exhibits to those documents, unless the exhibits are specifically incorporated by reference into the information that this prospectus incorporates. You should direct a request for copies to ENDRA Life Sciences Inc., 3600 Green Court, Suite 350, Ann Arbor, Michigan 48105; Telephone: (734) 335-0468.

INCORPORATION BY REFERENCE

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

We incorporate by reference into this prospectus and the registration statement of which this prospectus is a part the information or documents listed below that we have filed with the SEC:

- Annual Report on Form 10-K for the fiscal year ended December 31, 2017 filed with the SEC on March 20, 2018 (as amended by Form 10-K/A filed with the SEC on April 13, 2018);
- Quarterly Report on Form 10-Q for the quarter ended March 31, 2018 filed with the SEC on May 15, 2018 and for the quarter ended June 30, 2018 filed with the SEC on August 13, 2018;
- Current Reports on Form 8-K filed with the SEC on February 5, 2018, March 29, 2018 (as amended by Form 8-K/A filed on April 13, 2018), June 15, 2018; July 2, 2018; and August 17, 2018;
- Definitive Proxy Statement on Schedule 14A related to our 2018 Annual Meeting of Stockholders, filed with the SEC on May 10, 2018; and
- The description of the Company’s common stock contained in the Company’s Registration Statement on Form 8-A (File No. 001-37969) filed with the SEC on December 16, 2016 pursuant to Section 12(g) of the Exchange Act, including any amendment or reports filed for the purpose of updating such description.

We also incorporate by reference any future filings (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items unless such Form 8-K expressly provides to the contrary) made with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made on or after the date of the initial filing of the registration statement of which this prospectus is a part and prior to effectiveness of such registration statement, until we file a post-effective amendment that indicates the termination of the offering of the Securities made by this prospectus and will become a part of this prospectus from the date that such documents are filed with the SEC. Information in such future filings updates and supplements the information provided in this prospectus. Any statements in any such future filings will automatically be deemed to modify and supersede any information in any document we previously filed with the SEC that is incorporated or deemed to be incorporated herein by reference to the extent that statements in the later filed document modify or replace such earlier statements.

We will furnish without charge to you, on written or oral request, a copy of any or all of the documents incorporated by reference, including exhibits to these documents. You should direct any requests for documents to ENDRA Life Sciences Inc., 3600 Green Court, Suite 350, Ann Arbor, Michigan 48105; Telephone: (734) 335-0468. Copies of the above reports may also be accessed from our web site at www.endrainc.com. We have authorized no one to provide you with any information that differs from that contained in this prospectus. Accordingly, you should not rely on any information that is not contained in this prospectus. You should not assume that the information in this prospectus is accurate as of any date other than the date of the front cover of this prospectus.

Any statement contained in a document incorporated or deemed to be incorporated by reference in this prospectus will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus or in any other subsequently filed document which also is or is deemed to be incorporated by reference in this prospectus modifies or supersedes that statement. Any statement that is modified or superseded will not constitute a part of this prospectus, except as modified or superseded.



ENDRA Life Sciences Inc.

\$2,735,000 of Shares of Common Stock
\$ per Share

PROSPECTUS SUPPLEMENT

National Securities Corporation

October , 2018
